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Analysis of Social and Institutional Determinants of the Public Expenditure Buoyancy in Pakistan

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ABSTRACT

Objective: This research intended to quantify the impact of social and institutional handles on the public expenditure's buoyancy in Pakistan.

Research Gap: Very few studies explained the impact of the social and institutional handles on the public expenditure's buoyancy.

Design/Methodology/Approach: This study employed employed Augmented Dickey Fuller Test, Johansen Co-integration and Autoregressive Distributive Lag model on time series data ranging from 1990 to 2021.

The Main Findings: The results depicted that unemployment, literacy rate, Government size, dependency ratio and corruption have positive impact while Government effectiveness, fiscal decentralization, income inequality and fiscal illusion have negative impact on public expenditure's Buoyancy.

Implications of the Findings: The results implied that Government should take measures to attract foreign direct investment, focus on skills development, initiate labor-intensive projects and promote entrepreneurship in order to solve the issue of high unemployment. Moreover, government must make efforts to enhance literacy rate particularly female literacy rate, reduce employee size and dependent population, and enhance transparency by eliminating the corruption. There is also a need to improve quality of bureaucracy, its efficiency, effectiveness, education and infrastructure. Decentralization of financial, political and administrative authorities to the lower tier of the political system will reduce corruption and improves governance. Finally, it is also suggested that Government should give special attention to Social Security programs like Benazir Income Program, Sehat Sahulat Program and other measures to eradicate poverty and improve income distribution.

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1. Introduction

Public expenditure is a very important tool of an effective fiscal policy. The public expenditures are manipulated to attain the full employment, economic stability and to achieve sound economic growth. If public expenditures are efficiently used, it could bring prosperity in the economy. The most accurate indicator of the efficiency of fiscal policy is the buoyancy of public expenditure. The effective fiscal policy should have controlled public expenditure and low buoyancy. The most of the developing countries are heavily indebted, having high expenditures on debt repayment and servicing and high expenditure buoyancy, (Abu et al., 2022). The high expenditures and its high buoyancy will create a large and

unsustainable fiscal deficit and accumulate the debt burden. So an efficient fiscal policy should have least expenditures and its buoyancy. To formulate an efficient fiscal policy, the policymakers must know the buoyancy of public expenditure and factors that determine the buoyancy, so Govt could manage and decrease the public expenditure, budget deficit and debt burden.

In ineffective fiscal policy the tax revenue does not increase in response to GDP while public expenditure is increasing more than proportionate to GDP. Thus, fiscal deficit in Pakistan is increasing day by day, as for the fiscal year 2020-21 it was 8.1 per cent of the GDP exceeding 3.5 trillion PKR, (Pakistan Economic Survey, 2020-21). Pakistan could not raise sufficient revenue to meet its expenditure and its tax buoyancy was less than unity, (Shahzada et al., 2016). On the contrary Public expenditures have increased more proportionally than an increase in the GDP as a rise in GDP have increased the demand of the public goods, which would increase the public expenditures more than an increase in GDP, (Wagner, 1911).

To predict the fiscal deficit and public debt, it is necessary to calculate the buoyancy of public expenditure. The intentions of this research is the identification and quantification of the major social and institutional handles of public expenditure's buoyancy. This study in the first step estimates the buoyancy of public expenditure and secondly it quantifies the impact of major determinants on public expenditure's buoyancy.

1.1. Buoyancy of Public Expenditure

Public expenditures are highly responsiveness towards any change in the GD, a rise in GDP would generate a highly proportional rise in government expenditures, which means that a one per cent rise in the GDP would generate more than one per cent increase in government expenditure (Wagner, 1911). He stated that growth in expenditure depends on industrialization and during the automation process the public administrative and protective expenditures were also increased. Srinivasan (2013) concluded that economic growth has more than proportional impact on public expenditure. Najarzadeh (2019) also identified more than proportional relationship between GDP and Public expenditure.

Maluleke (2017) concluded that GDP, tax revenue, trade openness, poverty, public debt, and urbanization were the prominent handles of public expenditure. Facchini (2018) inferred that economic, institutional, social, structural, and political variables were the major determinants of public expenditures. Rodden (2003) concluded that more decentralized tax and expenditures the less would be the tax and expenditures of the public which is called Fiscal Leviathan hypothesis. Baumol's Disease Effect stated that an increase in the cost of public goods would increase public expenditures, (Henrekson & Lybeck,1988). Neck and Getzner (2007) and Borcherding (1985) also supported Baumol's disease effect stating that the prices of public goods were the major drivers of public expenditure. Buchanan and Tullock (1977) had explained that the size, inefficiencies, privileges, self-interest, lack of competition and corruption of the bureaucrats had increased public expenditure. The young and old age peoples also exert pressure on the Government to increase education and medical facilities, which increased public expenditures, (Shelton, 2008). Persson and Tabellini (2002) have inferred that the presidential regimes have lower spending than the parliamentary system.

The fiscal illusion states that government implicitly manages the tax and expenditure in a way that it would not be understandable to the public. The government overstates the benefits that people receive and keep the tax burden implicit. Therefore, people underestimate the tax burden and overestimate the benefits and demand more public goods, which increase the public expenditure (Hettich & Winer, 1984). The decentralization hypothesis stated that the public expenditure would be the least in the presence of decentralized fiscal policy, (Brennan & Buchanan, 1980). International trade would increase the income volatility and responsibility of the government to take stabilization measures and would increase expenditure, Rodrik (1998). A fairer income distribution might reduce while more skewed income distribution would increase government expenditure on redistribution and the protection of property rights, Stigler (1970).

1.2. Social and Institutional Determinants

Many social and institutional variables may affect public expenditure and its buoyancy. The literature has identified the following important variables that might affect public expenditure and its buoyancy.

The size of employees and corruption might have positive impact on public expenditure and its buoyancy. Craswell (1975) and Buchanan and Tullock (1972) have declared that the size, inefficiencies and corruption of the bureaucrats has increased the Govt expenditure. They also explained that when employee size grow it would compel the people to demand more growth in spending (Green & Munley, 1979).

The unemployed strived to get Govt funds and caused an increase in Government expenditure. Shelton (2008) stated that the young and old demanded an increase in scholarships on education, medical facilities and old age benefits, which would increase the Govt expenditure. Persson and Tabellini (2002) inferred that the presidential regimes have lower spending than the parliamentary system. In fiscal illusion Govt intentionally overstates the benefits that people receive and try to keep the tax burden implicit. Therefore, people underestimate the tax burden on them and overestimate the benefits that they receive from the Government, this increases the demand for public goods, Govt expenditure, deficit financing and liabilities which is termed as fiscal illusion. Due to complex tax system peoples would underestimate their true fiscal burden and price of public goods and it would produce perception bias, (Hettich & Winer, 1984). The fiscal illusion would increase the budgetary expansion (Da Empli, 2002). It is measured by various indicators which are the Herfindahl Index, Flypaper effect, Debt Illusion, Revenue illusion, Revenue Illusion and Public deficit.

The decentralization and leviathan hypothesis states that the decentralized taxes and expenditure will reduce the public expenditures. It would decrease the cost of the information, increase accountability, decrease the fiscal illusion and government expenditure, (Brennan & Buchanan, 1980).

The increase in the dependent population can also increase the public expenditure on old age benefits, pensions and transfer payments. The population age structure (0-14) and (60–70) have positive impact on public expenditure. It was also concluded that other socio-economic factors: corruption and GDP per capita have negative while foreign aid and unemployment rate have positive impact on public expenditure, (Azolibe et al., 2020). Shelton (2007) concluded that the population below 15 and above 60 has positive impact on public expenditure.

Fairer income distribution may reduce Govt expenditure while skewed distribution can increase expenditure on redistribution and the protection of property rights. Stigler (1970) stated public expenditures benefit the middle class and financed by taxes from poor and the rich which is called Directors Law. Romer (1975) said that inequality in income distribution would induce the people's demand for redistributive fiscal measures and increase Govt expenditure. Bénabou (2000) contradicted the direct nexus among the inequality and Government spending. Pryor (1968) stated that unequal distribution would create law and order problems and increase Govt expenditure. The increase in the income inequality has increased the public expenditures, (Maddah and Jeyhoon-Tabar , 2022).

The literacy rate has positive relationship with public expenditure. The literacy rate can affect public expenditure in two ways, to increase the literacy-rate the Government has to increase its expenditure on education secondly, literacy rate increases the awareness in the people about their rights which forced the Govt to increase expenditures. Sudasinghe (2015) identified that increase in literacy has a direct nexus with public expenditure. Akanbi (2014) identified that expenditures have a positive impact on public expenditure. Remman et al. (2011) revealed that health expenditures were inelastic. Fasoranti (2015) evaluated that literacy rate has positive impact on health expenditure. Akanbi and Schoeman (2010) concluded that education expenditure was positively related to public expenditures.

The increase in the Government effectiveness can increase the optimality in allocation and can reduce the Govt expenditure and increase its efficiency. Akanbi (2014) inferred that Government effectiveness would decrease the public expenditure.

Democracies would make the income distribution fairer as compared to non-democracies (Mueller & Stratmann, 2003) and reduce the public expenditure. Income and wealth tax did not improve redistribution of income, (Aidt & Jensen, 2009). Evidences from recent transitions showed that democracy has strong nexus with taxes on consumption but has weak connection with taxes on income and capital, (Timmons, 2010). The democratic institutions will have direct impact on taxes (Hettich & Winer, 1984).

The fiscal policy of developing countries was inefficient and inelastic in term of taxes, Sheikh et al, (2018). The evidence of the inefficient taxation system was that tax revenue did not increase along with an increase in GDP and fiscal deficit in Pakistan was increasing day by day. The fiscal deficit of Pakistan for the fiscal year 2020-21 was 8.1 per cent of the GDP, which was more than 3.5 trillion PKR, (Pakistan Economic Survey, 2020-21). While expenditure was highly elastic and buoyant to the GDP, (Wagner, 1911). This will increase the fiscal deficit and public debt. To gauge and control the fiscal deficit and public debt, it is necessary to calculate the buoyancy of Government expenditures and analyze the impact of its major handles. The objective of this research is the identification and quantification of impact of major social and institutional determinants of expenditure's buoyancy. This study is conducted in two steps, first step of this study will find the value of Govt expenditures buoyancy and then in the next step study will quantify the impact of the political and institutional handles on Govt expenditure's buoyancy. If the determinants of Govt expenditure's buoyancy identified, then by different discretionary measures Govt can reduce the fiscal deficit and debt burden. This study analyze the major determinants of Govt expenditure's buoyancy through Johansen Co-integration and Autoregressive Distributive Lag Model (ARDL).

1.3. Research Gap

This research intended the identification and quantification of impact of major social and institutional determinants of expenditure's buoyancy. This study is conducted in two steps, first step of this study will find the value of government expenditures buoyancy and then in the next step study will quantify the impact of the political and institutional handles on government expenditure's buoyancy. After the identification of the handles this study will suggest different discretionary measures through which Govt can reduce the fiscal deficit and debt burden.

1.4 Objectives

The major intentions of this study are to evaluate the impact of social and institutional variables on the buoyancy of public expenditure of Pakistan. The objectives are explained as following :

To estimate the numerical value of public expenditure's buoyancy.

To quantify the impact of social and institutionnel handle's on Govt expenditure's buoyancy.

1.5. Significance of the Study

This study can help the fiscal policy authorities to formulate such policy which can reduce the fiscal deficit. The reduction in the fiscal deficit can decrease the growth rate of the public debt. The reduction in the public debt can reduce the debt repayment and servicing, which can provide ample amount of funds for developing purpose, consequently it can boost the economic growth of Pakistan. Moreover, it can also reduce the unemployment and increase the employment opportunities.

This is a known fact that the fiscal deficit is also causing worst impacts on Pakistan's sovereignty. Inflation further reduces the demand for locally produced goods and increases imports of cheaper goods, which further aggravates the problem of Balance of Payment, (BOP) and generates the foreign exchange reserves crisis in Pakistan. The intensity of these problems can be minimized, if Pakistan has an efficient and effective fiscal policy.

This study will also explain to the authorities that how unemployment, income inequality and public effectiveness will affect the growth of public expenditure and what measure should authorities take to reduce the public expenditures and fiscal deficit.

2. Literature Review

This section includes the comprehensive literature reviews on the topic of the research, the reviews included from 2002 to 2022.

Baqir (2002) inferred that democracy has direct nexus with spending on education and health. He concluded that increase in democracy produces one percent increase in general expenditure while 3 percent in social expenditure. He also indicated that social sector spending was more cloistered.

Abeng (2005) suggested that GDP, population, and political activities has positive effects on government expenditure while inflation has negative impact on govt expenditure. He also stated that a one percent increase in tax revenue would increase the public expenditure by 29 percent. They argued that government should channel the resources towards productive activities which would enhance growth and development.

Cavallo (2005) compared the consequences of the current account shocks to the shocks to government expenditure. An increase in government expenditure produced a sizeable deterioration in the external balance while it has smaller impact on the current account. He indicated that Government expenditure on final goods led to enhance its role for the fluctuation external balance.

Bel and Elias-Moreno (2009) investigated the linkage between defense expenditure and government form, electoral rules and concentration of political parties. The results identified that presidential system spend more than the parliamentary system on defense. They inferred that the plurality voting system would reduce defense burden. They concluded that institutions have badly failed to channel the resource and recommended an extensive overhauling of the institutions.

Anwar and Ahmad (2012) examined the nexus between fiscal deficit, democracy, and Govt size for Pakistan. They revealed that there existed a strong nexus between the fiscal deficit and political handles. They concluded that a large Govt size would increases the fiscal deficit while the fiscal deficit would decrease in democracy.

Dermechi and Zakane (2018) found that public expenditure was mainly determined by financial repression level, GDP, trade openness, public debt and urban population. Empirical analysis revealed that unemployment did not directly affect the public expenditure level but it is the state intervention by the financial system.

Ahaisibwe (2018) examined the handles of government expenditure on infrastructure. He concluded that Government revenue and public debt have positive impact on Govt expenditure on infrastructure in Uganda. There was no indication of a link between Government spending on infrastructure and external assets and allowances. The nonexistence of trade-offs could lead to the buildup of reserves above the peak level.

Arif and Hussain (2018) revealed the fundamentals of budget deficit and analyzed role of institutions, corruption, political instability, and the military in politics and conflicts on budget deficit. The results of the above models confirmed that corruption and political stability were important indicators of budget deficits.

Al-Sabah (2019) stated that important handles of public expenditures were public consumption, transfer payments, oil growth, non-development expenditures and GDP. The GDP per capita has positive impact on Govt expenditure. The consumption and transfer expenditure revealed positive effect on the entire size of the economy and magnified the economy.

Nganyi et al. (2019) evaluated the Kenya vision-2023 to identified stimulus of the planning process, sources of funds, and management duty on Government expenditure on public projects as determinants of Govt expenditure. They used public finance, budget, cost-benefit analysis, and principal-agent theories in

the study. They concluded that the planning process, source of funds, and management duty ensured a significant positive impact in determining Government expenditure on a public project in Kenya.

Florian et al. (2020) stated the major handles of social expenditure were globalization, government ideology and electoral motives, demographic change and unemployment. They concluded that budget deficits, trade and fractionalization of the party system have inverse impact on social expenditure. Aging, unemployment, social globalization, coalition governments and public debt were positively related to social expenditure. They advised that countries should use domestic measures to design social policies.

Nawaz and Khawaja (2020) concluded that institutional quality has negative impact on public size while it has positive impact on capital spending. They also inferred that institutional democracy, political regime, stability and GDP have direct impact on public size. They recommended that a stable political system supported by good quality institutions is a prerequisite to managing scarce public resources.

Beck and Mozdzen (2020) investigated the important institutional factors of public expenditure for OECD countries. They stated that the institutional factors were effective in determining the public expenditure. The study concluded that unemployment, inflation, dummies for post-crisis years, GDP growth have insignificantly related to the public expenditure in OECD countries. They confirmed that Scandinavian countries turn out to be the most fiscally responsible when institutional factors were considered.

Amin et al. (2020) concluded that bureaucratic quality, democratic accountability, internal conflict, external conflict, government stability, and military were the important institutional handles that affect public expenditure. They also concluded that total public spending increase with an increase in the level of corruption.

Khan (2022) stated that GDP, infant mortality, capital receipts, revenue receipts and international borrowing were the handles of health expenditures. Variables such as SGDP, revenue receipts, capital receipts and internal debt showed a positive impact while infant mortality has a negative impact on health expenditure. The results showed that richer states spend more compared to the poorer ones.

Cifuentes-Faura et al. (2022) investigated the major handles of fiscal deficits and found that important handles were GDP, unemployment, population, political participation, political sign of the ruling party or political force. Unemployment, Political participation and right-wing political parties have direct impact on deficit.

Erlangga et al. (2023) evaluated the handles of public expenditures for 102 countries of the world. They stated that the major handles of the public expenditures were economic and institutional. They concluded that corruption and voice of accountability were the important factors that determine the public expenditures.

This study intended the identification and quantification of impact of major social and institutional determinants of expenditure's buoyancy. This study is conducted in two steps, first step of this study will find the value of government expenditures buoyancy and then in the next step study will quantify the impact of the political and institutional handles on government expenditure's buoyancy. After the identification of the handles this study will suggest different discretionary measures through which government can reduce the fiscal deficit and debt burden.

3. Methodology and Data Sources

The size, inefficiencies and corruption of the government employees increases the public expenditure. Tullock (1972), Craswell (1975), and Buchanan and Tullock (1977) confirmed that the size, inefficiencies, and corruption of the bureaucrats would increase government expenditure. When size of government employee grew, more peoples would be in favor of further growth in the level of spending and people's representatives would vote for higher expenditure (Green & Munley, 1979).

The unemployed, dependent people and poor strive to get government funds and cause an increase in the government expenditure. Shelton (2008) stated that dependent peoples exerted pressure on the government to increase scholarships, medical facilities and old age benefits which would increase the government expenditure. They stated that labor tax and per capita transfers were directly related to ratio of retire to the working peoples, while inversely connected dependent population (Shelton 2007 & 2008).

Persson and Tabellini (2002) inferred for 80 democracies that presidential regimes have consumed smaller Govt's expenditures than parliamentary democracies. The country that is under threats of social and political instability tends to allocate the budget to restore stability and spend more on public services and defense. While less budget will be allocated to social and economic sectors. Countries have a history of coups, social unrests, and ethnic tensions tend to spend more on the military while politically stable countries spend more on education, health and economic services.

The Government intentionally overstates the benefits that peoples receive and keep the tax burden implicit. As consequence, peoples underestimate the tax burden and overestimate the benefits received from Government which is called fiscal illusion. It increases the demand for goods provided by the Govt because the masses expect the cost of public goods to be much lower than the actual which increases Government expenditures, and deficit financing.

Politicians have selected a tax structure to minimize the political costs of taxes (Hettich & Winer 1984) which results in fiscal illusion (Da Empli 2002). The Fiscal Illusion is measured by Herfindhal Index, Flypaper effect, Debt Illusion, Revenues Illusion and Public deficit illusion. The intensity of the fiscal illusion was determined by the voracity effect (Lane & Tornell, 1996; Tornell & Lane, 1999), which states that if the sale tax elasticity is high and expenditure comes from intergovernmental transfers, the fiscal illusion will increase the public expenditure. On the other hand, if the elasticity of sale tax is low then the FI would be unable to increase the public expenditure.

It was clarified that fiscal decentralization was also an important variable that do affect public expenditure. **Decentralization hypothesis** explained that reduced Government involvement in economy would decrease the cost of information and the local Government was more accountable to the peoples who would decrease the fiscal illusion and public expenditure, (Brennan & Buchanan 1980). Fiscal **Leviathan hypothesis** also told that least government intrusion would cause taxes and expenditures were decentralized, which would increase tax revenue and reduce the public expenditure Rodden (2003).

The dependency ratio is measured through dependent population as percentage of the total population. The increase in the dependent population will increase the public expenditure on the old age benefits, pensions and transfer payments and public expenditure, Azolibe et al. (2020). Shelton (2007) concluded that depended population and population growth have a direct impact on the public expenditure.

The distribution of income can also affect the public expenditure; a fairer income distribution may reduce Government expenditure while skewed will increase Govt expenditures on redistribution and for property rights. Borcherding (1985) and Romer (1975) concluded that skewed income distribution would increase the people's demand for more funds for redistribution and would increase public expenditure. Bénabou (2000) inferred that equal income distribution has inverse impact on the public spending. Pryor (1968) said that unequal distribution would increase the police services and expenses on property rights protection. De Mello and Tiongson (2006) and Shelton (2007) concluded that unfair income distribution would increase the government expenditure.

The literacy rate can affect the public expenditure in two ways, to increase literacy rate the government has to increase expenditure on education. Again literacy rate will increase the awareness about rights and obligation which will force the government to increase expenditure. Sudasinghe (2015) concluded that increase in literacy has positive impact on the public expenditure. Remman et al. (2011) showed that health expenditures were negatively related to life expectancy and literacy rate. Fasoranti (2015) concluded that

literacy rate has positive impact on the health expenditure. Akanbi and Schoeman (2010) concluded that education expenditure was directly related to the public expenditures.

The government effectiveness has an inverse impact on the public expenditures. The government effectiveness measured by an index which is estimated by the World Bank, which calculates the quality of public services, civil service, policy formulation, policy implementation and credibility of a government's commitment to raise these qualities. This index includes 193 countries ranked from -2.5 (less effective) to 2.5 (more effective). The increase in the Government effectiveness will increase the optimality in the use government expenditure that will indeed reduce the Government expenditure, Akanbi (2014).

Unemployment is the recurring feature of the developing countries. Unemployment has a positive nexus with public expenditure. An increase in unemployment would increase the public expenditure on the social welfare programs and unemployment allowance. An increase in unemployment would increase the Government expenditures allowance, grants, subsidies, and transfer payment, which would increase the expenditure's buoyancy Shelton (2008). Unemployment was measured as total unemployed person as percentage of labor force.

3.1. Variables of the Study

The objective of this study was to quantify the impact of social and institutional determinants on public expenditure's buoyancy. The various handles used in this paper are tabulated below.

Table: 1 Variables of the Study

S No	Variable	Code	Nature	Sign	Measurement
01	Expenditure Buoyancy	SIB_{GE}	Dependent		Calculated in step-1
02	Dependency Ratio	DR	Independent	Positive	Dependent Population as Proportion of Population.
03	Unemployment	U_N	Independent	Positive	Percentage of Labor Force.
04	Literacy Rate	Edu	Independent	Positive	Enrollment at HSSC level
05	Income Inequality	G	Independent	Positive	Gini Coefficient
06	Fiscal illusion	FI	Independent	Positive/ Negative	Indirect Tax as Proportion of Direct tax.
07	Political Stability	PS	Independent	Negative	It takes value 1 for Democracy and zero otherwise
08	Size of Government employees	GS	Independent	Positive	Government Employee as Proportion of Total Employment
09	Fiscal Decentralization	FD	Independent	Negative	Zero before 18^{th} amendment and 1 after 18^{th} amendment
10	Government Effectiveness	GE	Independent	Negative	World Governance Indicators
11	Corruption	C	Independent	Positive	Corruption index

SIBGE is the public expenditure buoyancy, which is the function of social and institutional determinants.

Government Expenditure Buoyancy = F (Dependency Ratio, Unemployment, Literacy Rate, Income Inequality, Fiscal Illusion, Political Stability, Size of Government, Fiscal Decentralization, Government Effectiveness and Corruption).

$$\mathbf{SIBGE} = f(DR, UN, Edu, G, FI, PS, SG, FD, GE, C)$$

$$SIBGE = \beta 0 + \beta 1\, DR + \beta 2\, UN + \beta 3\, Edu + \beta 4\, G + \beta 5\, FI + \beta 6\, PS + \beta 7\, GS + \beta 8\, FD + \beta 9\, GE + \beta 10\, C + \mu \quad (1)$$

Where SIBtax is the Buoyancy of the Public Expenditures of Pakistan, DR is dependency ratio, UN is unemployed population, Edu is the literacy rate, G is the income inequality, FI is the fiscal illusion, PS is the political instability, SG is the size of government employees / bureaucrats, FD is the fiscal decentralization, GE is the government effectiveness and C is corruption.

3.2. Econometric Technique and Research Methodology

The analysis was done in two steps, in first step this research has estimated the public expenditure's buoyancy while in second step this study has quantified the impact of social and institutional handles on public expenditure. The buoyancy of Government expenditure is calculated by using Co-integration Approach. For co-integration all variables must be non-stationary at level but stationary at first difference I (1). Furthermore, the Engel Granger Test should also verify long run co-integration. The following econometrical equation was used to calculate the buoyancy of Government expenditure as explained by Wagner's law.

$$\mathrm{Log(SIBGE)} = \alpha o + \alpha 1 \mathrm{logGDP} + e \quad (2)$$

Where GE was the total government expenditure and α1 was the buoyancy of government expenditure with respect to GDP and e was the random error.

The second step of this research study has quantified the impact of social and institutional variables on the buoyancy of public expenditure. The estimated buoyancy expenditure was regressed on social and institutional variables. This study employed the ARDL co-integration to quantify the long and short run impact of the handles on the expenditure's buoyancy. When the variables are integrated of different order, some variables are integrated I (0) and other integrated I (1), then the model that is used in this situation can be Autoregressive Distributive Lag model (ARDL). In this research dependent variable is I (0) and independent variables are integrated of mixed order, some are integrated at level I (0) and some at first difference I (1). The existence of ARDL type co-integration is further verified by using ARDL bound test. The lag length or order of the ARDL is determined by using various criteria like SBC and AIC. The following ARDL model is employed in this study.

$$\mathrm{SIBGE} = \beta 0 + \beta 1\,\mathrm{DR} + \beta 2\,\mathrm{UN} + \beta 3\,\mathrm{Edu} + \beta 4\,\mathrm{G} + \beta 5\,\mathrm{FI} + \beta 6\,\mathrm{PS} + \beta 7\,\mathrm{GS} + \beta 8\,\mathrm{FD} + \beta 9\,\mathrm{GE} + \beta 10\,\mathrm{C} + \beta 11\,\mathrm{SIBGE}(-1) + \beta 12\mathrm{C}(-1) + \mu \quad (3)$$

The Error Correction equation of the model that capture the short run nexus is as following.

$$\triangle(\mathrm{SIBGE}) = \alpha 0 + \alpha 1\ \triangle(\mathrm{DR}) + \alpha 2\ \triangle(\mathrm{UN}) + \alpha 3\ \triangle(\mathrm{Edu}) + \alpha 4\ \triangle(\mathrm{G}) + \alpha 5\ \triangle(\mathrm{FI}) + \alpha 6\ \triangle(\mathrm{PS}) + \alpha 7\ \triangle(\mathrm{GS}) + \alpha 8\ \triangle(\mathrm{FD}) + \alpha 9\ \triangle(\mathrm{GE}) + \alpha 10\ \triangle(\mathrm{C}) + \mathrm{ECM}(-1) + \mu \quad (4)$$

3.3. Data Sources

This research study used the TSD from 1991 to 2021 for the period of 30 years. The E-views 8 was used for the data analysis. The data was retrieved from World Bank, State Bank, Statistical Bureau, world Governance Indicators and World Development Indicator.

The following table explains the data source of each variable.

Table 2: Sources of Data

S No	Variable	Code	Nature	Data Source
01	Expenditure Buoyancy	SIB_{GE}	Dependent	Calculated in step-1
02	Dependency Ratio	DR	Independent	World bank
03	Unemployment	U_N	Independent	World bank
04	Literacy Rate	Edu	Independent	State Bank of Pakistan
05	Income Inequality	G	Independent	World bank
06	Fiscal illusion	FI	Independent	State Bank of Pakistan

07	Political Stability	PS	Independent	It takes value 1 for Democracy and zero
08	Size of Government	GS	Independent	government Employee as Proportion of
09	Fiscal Decentralization	FD	Independent	Zero before 18th amendment and 1 after 18th
10	Government Effectiveness	GE	Independent	World Governance Indicators
11	Corruption	C	Independent	World Governance Indicators

Source: Authors' compilation

4. Data Analysis and Interpretation

This section included the analysis of the social and institutional determinants of the Government expenditure's buoyancy. The major handles included in this analysis were control of corruption, unemployment, literacy rate, income inequality, fiscal Illusion, political stability, government effectiveness, dependency ratio, fiscal decentralization and government size.

4.1. ADF Test

Table: 3 Results of ADF Tests

S. No	Name	ADF	Test value	Critical Values at	Results
01	Expenditures Buoyancy	Level	-3.474762	-1.952473	I (0)
		1st difference	----------	----------	
02	Corruption	Level	-3.298264	-3.568379	I (1)
		1st difference	-5.531507	-3.574244	
03	Unemployment	Level	-1.332476	-3.568379	I (1)
		1st difference	-5.039085	-3.574244	
04	Literacy Rate	Level	-3.235623	-3.568379	I (1)
		1st difference	-6.197556	-3.580623	
05	Income Inequality	Level	-4.824640	-3.574244	I (0)
		1st difference	----------	----------	
06	Fiscal Illusion	Level	5.307907	-3.622033	I (0)
		1st difference	----------	----------	
07	Political Stability	Level	0.759755	-3.568379	I (0)
		1st difference	-3.654940	-3.574244	
08	Government Effectiveness	Level	-2.136709	-3.574244	I (1)
		1st difference	-3.230162	-1.952910	
09	Dependency Ratio	Level	-2.725887	-1.954414	I (0)
		1st difference	----------	----------	
10	Fiscal Decentralization	Level	-2.081950	-3.568379	I (0)
		1st difference	-5.329558	-3.574244	
11	Government Size	Level	-5.304933	-3.568379	I (0)
		1st difference	----------	----------	

Source: Authors' compilation

The ADF test results showed that variables were integrated of different order, some variables were integrated at level I (0) and some variables were integrated at first difference, I (1). The expenditure's buoyancy, income inequality, fiscal illusion, political stability, dependency ratio, fiscal decentralization and Government size were integrated at level, I (0). While other variables were non-stationary at level and stationary at first difference, I (1). The results were according to the Autoregressive Distributive Lag Model (ARDL).

4.2. Bound Test

Table: 4 Results of Bound Test

Test Statistics	Statistics value	Level of Significance	Lower Bound	Upper Bound	Results
F-statistics	2.341375	5 %	2.04	2.08	ARDL Co-integration Exists

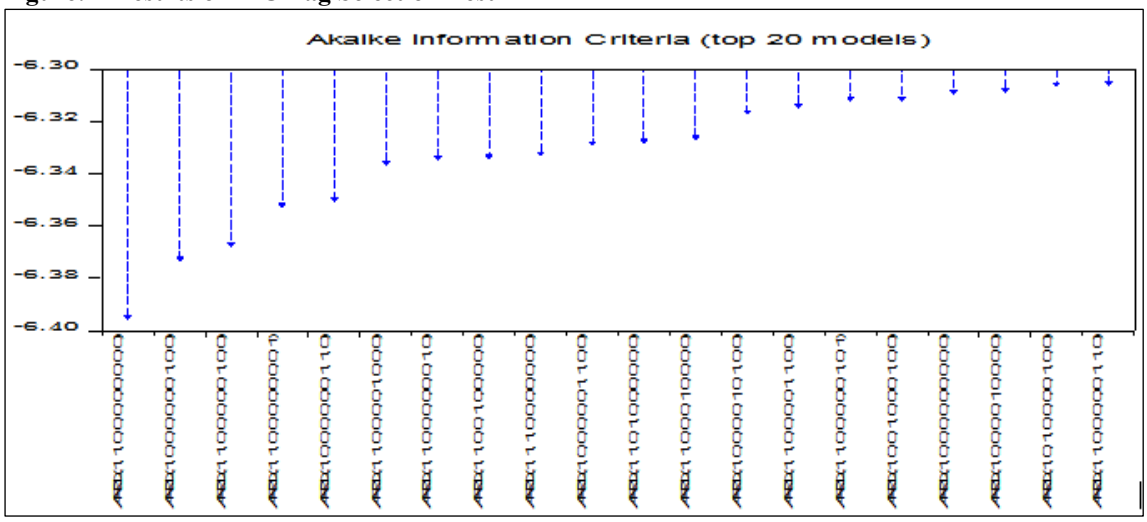
Source: Authors' compilation

The result of the Bound test has confirmed the existence of ARDL type Co-integration among the variables. The F-calculated was greater than the upper bound. The results have rejected the Null Hypothesis of the non-existence of the ARDL co-integration.

4.3. Testing the Order of the ARDL

This research has employed Akaike Information Criteria (AIC) graphical technique to confirm the lag order of ARDL model. The optimal lag length identified by the AIC for the ARDL model is 00000000100 as shown by the following AIC graph.

Figure: 1 Results of AIC Lag Selection Test



Source: Authors' compilation

4.4. Long Run Analysis of Government Expenditure's Handles:

Table: 5. Results of ARDL Co-Integration

S No	Variable	Coefficients	P-Value
01	Government expenditure's Buoyancy Buoyancy (-1)	0.632725	0.0042
02	Unemployment	0.001115	0.3250
03	Fiscal Illusion	-0.000502	0.8787
04	Literacy Rate	0.00211	0.1409
05	Government Employee Size	0.081057	0.7155
06	Dependency Ratio	0.002756	0.0536
07	Government Effectiveness	-0.048705	0.1432
08	Corruption	0.019794	0.3967
09	Corruption (-1)	-0.036753	0.1091
10	Fiscal Decentralization	-0.017966	0.0536
11	Income Inequality	-0.000392	0.8587
12	Constant	1.517285	0.0873

Source: Authors' compilation

The coefficient of the Government expenditure's buoyancy (-1) stated a direct impact on expenditure's buoyancy. The value of coefficient was 0.632725 which stated that one percent increase in the expenditure buoyancy (-1) would produce a 0.632725 change in expenditure's buoyancy.

Unemployment has a positive impact on public expenditure. The coefficient was 0.001115, which revealed that one percent increase in unemployment would increase expenditure's buoyancy by 0.001115. The results were according to the economic theory as an increase in unemployment would increase the

expenditures on allowances, grants, subsidies, and transfer payment which would increase the expenditure's buoyancy. The results validated the conclusion of Shelton (2008).

The fiscal illusion has a negative impact on public expenditure. Its coefficient was -0.000502, which stated that a one-unit increase in the FI would decrease the public expenditure's buoyancy by 0.000502. The results contradicted the basic economic theory and results of Da Empli (2002) as FI might increase the public expenditure. If the sale tax elasticity was high and the expenditure depended upon the intergovernmental transfers, the fiscal illusion would increase the public expenditure called voracity effect, (Lane & Tornell, 1996; Tornell & Lane, 1999). If the elasticity of sale tax was low then the FI would be unable to increase the public expenditure, Abbott and Jones (2016). The sign of nexu of fiscal illusion contradicts the basic economic theory due to the veracity effect.

The literacy rate has a positive impact on the public expenditure's buoyancy and validated the assertion of Sudasinghe (2015). The literacy rate would affect the public expenditure in two ways, to increase literacy rate the Govt might have to increase its expenditure on education. Again, the increase in literacy rate would increase the awareness in the people about their rights, which would force the Govt to increase their expenditure. Akanbi (2014) identified that development expenditure has positive impact on the public expenditure. Akanbi and Schoeman (2010) also concluded that education expenditure was directly related to the public expenditure.

The size of the Government has positive impact on the expenditure's buoyancy. Its coefficient was 0.081057. The sign of the relationship followed the economic theory. Tullock (1972), Craswell (1975) and Buchanan and Tullock (1977) hypothesized that the size, inefficiencies, privileges, self-interest, lack of competition and corruption of the bureaucrats would increase the government expenditure.

The coefficient of dependency ratio was 0.002756 which has stated a positive impact on expenditure's buoyancy. The unemployed and dependent population would strive to get government funds and cause an increase in the Government expenditure. Shelton (2008) stated that dependent population would exert pressure on the Govt to increase scholarships, education facilities, medical facilities and old age benefits, which would increase the Government expenditure. The per capita transfers were positively related to ratio of retire to the working-population, while negatively related to ratio of children to the working population (Shelton, 2007 & 2008).

Corruption also has the direct impact on the public expenditure's buoyancy and coefficient was 0.001979. This study validated the conclusion of Arif and Hussain (2018) they stated that corruption has the positive impact on the public expenditure.

The Government Effectiveness has an inverse impact on the public expenditure's buoyancy, its coefficient was -0.048705. The results validated the economic fact as increase in the GE would increase the allocation optimality of expenditure that would indeed reduce the government expenditure. Akanbi (2014) inferred that Government effectiveness and good governance would decrease the public expenditure.

Fiscal decentralization has an inverse impact on the public expenditure's Buoyancy its coefficient was -0.017966. The study verified the fiscal decentralization hypothesis and Fiscal Leviathan Hypothesis. The decentralization hypothesis stated that decentralization would decrease cost of information and the local Governments would be more accountable to the people, which would decrease the fiscal illusion and public expenditure. Th Leviathan hypothesis stated that smaller the Govt intrusion in economy the greater the extent to which taxes and expenditures were decentralized, which would reduce the public expenditure, Rodden (2003).

Income inequality has negative impact on the public expenditure's buoyancy. The results negated the economic theory as fairer income distribution would reduce while skewed income distribution would increase Govt expenditure on redistribution and protection of property rights (Borcherding, 1985). Romer

(1975) concluded that skewed of income distribution would increase demand for funds for redistributive schemes and increase public expenditure. Pryor (1968) stated that more unequal distribution of income, the more police services would be desired and size of Government would increase to protect the property rights. De Mello and Tiongson (2006) and Shelton (2007) supported the idea that unfair income distribution would lead to increase the Government expenditure.

4.5. Diagnostic Tests

The total 98 percent of the variations were explained as shown by R-square. The F-statistic revealed that model was overall significant. Breusch-Pagan-Godfrey calculated test stated that there was no heteroscedasticity. Breusch-Godfrey statistics stated that there was no autocorrelation. The value of Wald statistics stated that model was jointly significant.

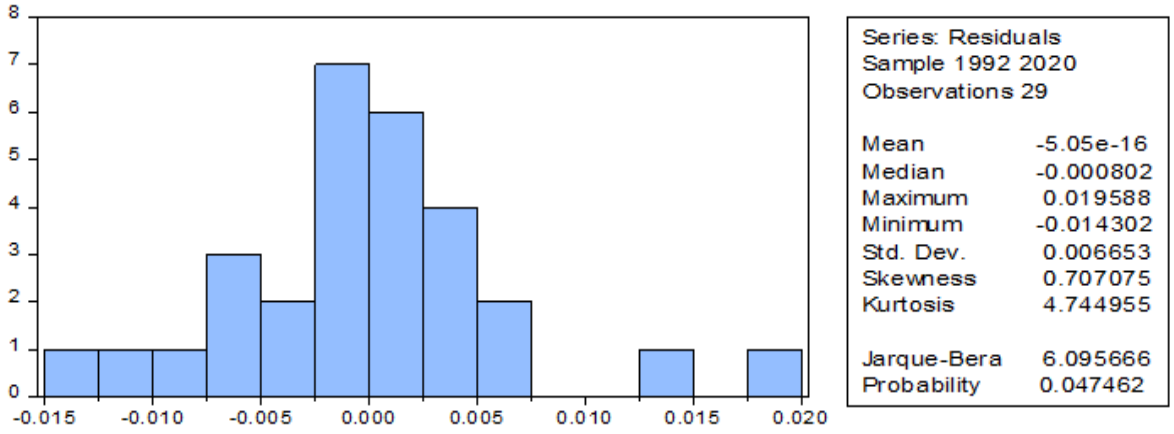
Table: 6. Diagnostic Tests of Long Run ARDL of Social and Institutional Determinants

S No.	Test Type	Null Hypothesis	Test Statistics	P-Values	Results
01	R-Squared		0.983907		Best Fit Model
02	F-Test	Model is overall insignificant	94.48936	0.000000	Model is overall significant
03	Breusch-Pagan-Godfrey	No Hetroscedasticity	11.74372	0.3832	No Hetroscedasticity
04	Breusch-Godfrey	No Autocorrelation	0.993166	0.6086	No Autocorrelation
05	Wald Test	All coefficients are Zero	6330.2	0.0000	Null Hypothesis Rejected

Source: Authors' compilation

4.6. Jarque-Bera Test of Normality

Figure: 2. Jarque-Bera Test



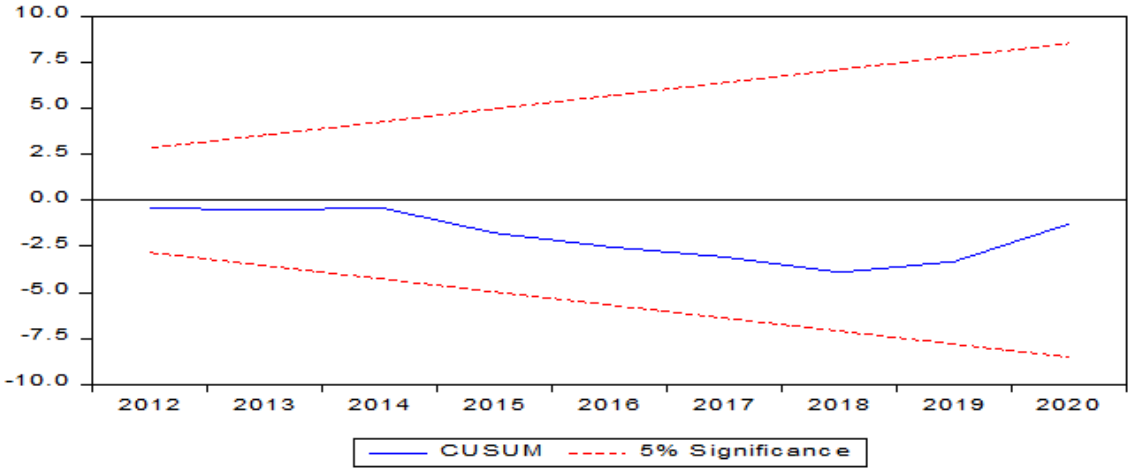
Source: Authors' compilation

The JB Test was used to check the model specification errors. It followed the $\chi 2$ distribution. The JB statistics p-value was 0.047, which stated that residual were normally distributed and the model was correctly specified.

4.7. CUSUM Test

The CUSUM test was used to check the stability of the model. The blue line was inside the red lines and model was stable.

Figure: 3. CUSUM Test



Source: Authors' compilation

4.8. Short Run Analysis of Public Expenditures Buoyancy

The short run nexus between the public expenditure's buoyancy and its social and institutional handles was captured through the Error Correction Model.

Table: 7. Short Run Coefficients

S No	Variable	Coefficients	P-Value
01	Dependency Ratio	0.000956	0.8385
02	Unemployment	0.001733	0.2878
03	Fiscal Illusion	-0.002417	0.7127
04	Literacy Rate	1.05E-05	0.4097
05	Government Employee Size	-0.012927	0.9350
06	Government Effectiveness	-0.038432	0.2747
07	Corruption	0.022278	0.3469
08	Fiscal Decentralization	-0.012227	0.2774
09	Income Inequality	0.001051	0.6615
10	C	-0.005330	0.2414
11	Error Correction Coefficient	-0.6761	0.0296

Source: Authors' compilation

The dependency ratio, unemployment, literacy rate, corruption and income inequality have direct and positive effect on the public expenditure's buoyancy in short run. The signs of relationship between these variables and public expenditures are according to the economic theory. The dependency ratio increase the size of dependent population and burden of social infrastructure and increases the public expenditures. The unemployment will increase the public expenditures on unemployment allowance and other compensations and will increase the public expenditures and its buoyancy. The literacy rate will increase the awareness in the peoples about their rights and compel the government to increase its expenditures. While the income inequality will increase the public expenditures on the redistribution schemes and will increase the public expenditures. While fiscal illusion, government employee size, government effectiveness and fiscal decentralization have negative impact on the expenditure's buoyancy in short run. The sign of nexu of fiscal illusion contradicts the basic economic theory due to the veracity effect. The sign of nexus among the fiscal decentralization and public expenditure is according to the economic theory as fiscal decentralization promotes the greater control and accountability over expenditures and decreases the expenditures. The ECM factor value was -0.47, which stated that any deviation from the co-integrated equilibrium path would be corrected in about two-year time.

5 Conclusion and Recommandations

5.1. Conclusion

The objective of this study was quantify the effect of social and institutional handles on public expenditure's buoyancy in Pakistan. The major social and institutional handles of the public expenditure's buoyancy were corruption, unemployment, literacy rate, income inequality, fiscal illusion, political stability, Government effectiveness, dependency ratio, fiscal decentralization and Government size. The analysis of data was done in two parts, the first part was used to estimate the public expenditure's buoyancy. While in the second step this research has analyzed the effects of major handles on expenditure buoyancy. The Study employed the TSD from 1990 to 2021. The study employed the Augmented Dickey-Fuller Test, Engel Granger test, EG co-integration, bound test and ARDL Co-Integration to evaluate the data. The variables were integrated of mixed order and the dependent variables were stationary at level I (0). Which has paved the way for ARDL co-integration and bound test confirmed the ARDL co-integration. The models was estimated for the long run with ARDL co-integration and for the short run with ECM. The results of the different models were concluded as followings:

The coefficient of the buoyancy (-1) stated a positive effect on expenditures buoyancy. The value of the coefficient was 0.633. An increase in the expenditure in the previous period would cause fiscal deficit and debt burden which would further increase the expenditure in the current time in the shape of debt servicing. Unemployment has a positive impact on public expenditure and its coefficient was 0.001115. An increase in unemployment would increase the expenditure on unemployment allowance, grants, subsidies, and transfer payments, which would also increase the expenditure's buoyancy, Shelton (2008). The fiscal illusion has a negative impact on public expenditure and its coefficient was -0.000502. The result has contradicted Da Empli (2002) that FI would increase the budget outlay and public expenditure's buoyancy.

The literacy rate has a positive impact on public expenditure buoyancy. The literacy rate could affect public expenditure in two ways, to increase the literacy rate the Government has to increase its expenditure on education. Again, the increase in literacy rate would increase the awareness in the people about their rights, which would force the Govt to increase their expenditure. Government employee size, dependency ratio and corruption also have direct impact on the Govt expenditure's buoyancy. The coefficient of Govt size was 0.081057. The coefficient of dependency ratio was 0.002756 and it was 0.001979 for corruption. All signs of the relationship followed the economic theory.

The increase in Govt effectiveness would increase the optimality in expenditure which would reduce the Govt expenditure and increase the efficiency of the public expenditure. Akanbi (2014) inferred that GE and good governance would decrease public expenditure.

Fiscal decentralization has negative impact on public expenditure. The **decentralization hypothesis** stated that total Government intrusion into the economy would be smaller the greater the extent to which tax and expenditure were decentralized (Brennan & Buchanan, 1980). Fiscal decentralization would decrease the cost of the information and the local Government were more accountable to the peoples which would decrease the fiscal illusion and public expenditure. Again the **Fiscal Leviathan hypothesis** stated that total government intrusion into an economy would be smaller, ceteris paribus the greater the extent to which tax and expenditure were decentralized which would increase tax revenue and reduce public expenditure Rodden (2003).

Income inequality has a negative impact on public expenditure buoyancy. The results have validated the conclusion of Bénabou (2000) where he argued that more inequality was associated with lower public spending on redistribution. The sign of relationship between income inequality and buoyancy has negated the economic theory. The more skewed income distribution would increase Government expenditure on redistribution and for the protection of property rights (Borcherding, 1985). Romer (1975) concluded that an increase in the skewness of income distribution would increase the people's demand for more funds for redistributive schemes, which would increase public expenditures.

5.2. Recommendations

According to the quantitative results this study recommends the following measures to reduce the public expenditure and its buoyancy.

Unemployment will increase expenditure, allowance, grants, subsidies and transfer payment and will increase the public expenditure. This study suggested that to reduce unemployment Govt should take measures to attract FDI, take measure to improve the skills of the youth on the latest technologies, initiate labor-intensive projects, particularly in the agriculture sector, take measures to reduce occupational and geographical immobility, lower the tax rate on business, and encourage the entrepreneurship.

The fiscal illusion has a negative impact on public expenditure's buoyancy. This study contradicted the conclusion of Da Empli (2002). The increase in indirect tax, money printing, long-term debt and hidden taxes reduces Government expenditure's buoyancy. Although it is contrary to the theory but in circumstances like Pakistan it is good to collect tax revenue whatever the source and cost.

The literacy rate has a positive impact on public expenditure's buoyancy. This study suggested the following measures to increase the literacy rate the Government must make 12th-grade education compulsory and free, increase the no of HSSC schools particularly for girls, promote distance education in its true sense and allocate an ample share of the budget for education.

Government Employee Size, Dependency ratio and Corruption also have positive and direct impacts on the Government expenditure's buoyancy. This study suggested that Govt should reduce it size in term of employee, reduce dependent population, and take measures to eliminate the corruption.

Government Effectiveness, Fiscal Decentralization and income inequality have a negative impact on the public expenditure's buoyancy. It is suggested that Govt should improve quality of bureaucracy, Govt efficiency and effectiveness, quality of education and infrastructure. This study also suggested that the financial, political and administrative control should delegated to the lower tier of the political system. Moreover, this study also suggested that Govt should enhance the Benazir Income Program, Sehat sahulat Program and other measures to eradicate poverty and improve income distribution.

5.3. Limitations of the study

The major limitation of the study was that the literature review on social and institutional factors and public expenditure was not available in the literature as it was a brand new topic. This study has employed the literature on social and institutional determinants of public expenditures as literature review and theoretical framework.

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Disclaimer

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