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Investment Portfolio, Democratic Accountability, Poverty and Income Inequality Nexus in Pakistan: A Way to Social Sustainability

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Abstract: Institutions help to streamline the economic activity-related procedures, where government intervention might be involved. Institutions also play a significant role in social sustainability. The findings using the Autoregressive Distributed Lag approach to cointegration for the period from 1984–2019 reveal that investment portfolio and democratic accountability reduce poverty in Pakistan both in the long and short run. Moreover, democratic accountability helps to reduce income inequality, but the investment portfolio's role is not significant. The literacy rate helps to reduce income inequality, and inflation increases poverty and income inequality. The remittances increase income inequality, and urbanization increases poverty. To eradicate poverty and income inequality, the governments should be accountable for their actions to the general public while they remain in power. If they do not deliver as per their manifestoes, they will not be reelected in the next election. Moreover, there is a dire need to redefine the role of an investment portfolio to reduce the risk of investment. So, investments would increase economic activities and could reduce poverty and income inequality. This study contributes to the literature by inquiring about the role of the investment portfolio and democratic accountability in social sustainability by reducing poverty and income inequality. This study only considers Pakistan's economy due to limitations of poverty data availability in other countries. The scope could further be broadened by accessing data for a wider Asia region to test the role of the investment portfolio and democratic accountability to reduce poverty and income inequality.

Keywords: investment portfolio; democratic accountability; poverty; income inequality; social sustainability; institutional quality

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1. Introduction

Income inequality is one of the most visible aspects and is a more complex issue that may affect a country at the economic, social, and political levels. It is a universal challenge that the whole world must address to achieve social sustainability [1]. According to the Pew Global Attitudes Survey [2], the gap between the rich and poor has increased in Africa and South Asia. Moreover, these regions carried an 80% share in global poverty and an 81% share in children deaths [1]. The economy of Pakistan is facing the problem of poverty since her independence. It is observed that the rate of poverty declined from 46% to 18% during the period 1960–1980. In the 1990s, the poverty rate rose to 34%, bringing several socio-economic problems for the economy. After the end of the Afghanistan war, the USA

government reduced its foreign aid. Moreover, nuclear sanctions, cut off aid, and freeze foreign accounts had an adverse effect on Pakistan's economy, which increased poverty.

The basic concept of institutional quality and governance originates from the earlier theories of democratic politics regarding the relationship between the political rulers and the ordinary people. Literature signified that the concept of governance had become important after the sudden demise of communism in the world. It became impossible for intermediary market economies to compete with the emerging market dynamics in the changing world order. Economies in transition faced many obstacles like the lack of an established institutional framework, unfinished contracts, inability to protect legal rights, incapacity of the insurance policies, and the lack of confidence in civil society. According to the 19th-century definition by Woodrow Wilson, governance may be defined as a form of government that can implement pre-designed policy successfully, efficiently, and in the prescribed manner without wasting excessive energy or money [3].

Generally, it is believed that a governance crisis might be responsible for increasing poverty. It is not easy to define precisely the concept of governance. Hence, there are different perceptions of the general masses and investors about the idea of good governance. The elements included in the governance are accountability, transparency, and the expectation of the general public and investors. However, governance may also be defined as a summation of three crucial dimensions, that is, economic, political, and civic governance. Governance is statecraft, which is one of the most complicated and sophisticated arts of the contemporary world. There are different kinds of statecrafts in different countries like kingship, monarchy, autocracy, oligarchy, dictatorship, and democracy. Today's modern world is moving fast towards democracy, so governance is better in developed countries and bad to worse in developing and underdeveloped countries. The importance of good governance is inextricably pivotal. Good governance is indeed statecraft with a developed, modernized, and sound system.

Alesina and Rodrik [4] observed that in a country where the resources and wealth were distributed unequally among public masses, the chances of economic prosperity and growth were decreased compared to the society where inequality in terms of resources was discouraged. Hence, income inequality is an important issue because of its possible linkages with economic growth and poverty. Poverty can only be alleviated if a rise in economic growth is sustainable and neutral concerning income dispersal [5]. The growth and inequality nexus might be observed to be high in developing countries. Moreover, developed countries have a low level of income inequality compared to developing countries. Thus, inequality is related to the level of development. In the context of income inequality, Ali and Saboor [6] argued that the global economic expansion had increased world employment by 30% during the 1990s, but employment gains were not shared equally.

The study's main objective is to investigate the effects of institutional quality on poverty and income inequality. This study has taken the investment portfolio and democratic accountability as a proxy for institutional quality, which might be considered a contribution to the literature. The increasing indices of the investment portfolio and democratic accountability reflect improving governance. An index of portfolio investment reflects the risk to investment, which is not covered by other governance indicators such as political, financial, and economic risk indicators. An increasing index of investment portfolio shows a low risk to investment. The risk may include contract unsustainability, profit misrepresentation, and delays in payment in the case of both local and foreign investments. The decreasing risk to investment may encourage investments in the country and could increase economic activities in response. Thus, it would raise the level of production and employment. The increased employment escalates income level, which helps the people to access the needs of life. By accessing fundamental requirements, deprivation of the people would fall, and hence poverty would be eradicated. The increased incomes would also help to reduce the gulf between the rich and the poor if income could be redistributed in favor of the poor. Thus, increasing the investment portfolio index and decreasing risk may decrease poverty and income inequality. Contrarily, the decreasing investment portfolio

index would increase poverty and income inequality. Democratic accountability refers to the degree of responsiveness of any government to its general public. An increasing democracy index shows less penetration of forces into a stable democratic system. In a stable democratic system, governments are accountable for their actions to their general public. If governments do not perform as per their manifestoes, their general public will reject them in a new election. Stable governance in terms of democracy would accelerate economic activities and reduce poverty and income inequality.

The effects of governance in terms of investment activities and democracy may have deep-rooted effects on poverty and income inequality, which need to be investigated in developing countries like Pakistan. Hence, we hypothesize that both institutional quality indicators would help in reducing poverty and income inequality in Pakistan. In addition, increasing employment and urbanization would have pleasant effects in reducing poverty as both variables would increase the economic activities and reduce poverty. On the other hand, inflation may reduce the purchasing power and could increase poverty. Hence, we hypothesize the positive effect of inflation and negative effects of urbanization and employment on poverty. In addition, inflation may also redistribute the wealth in favor of rich people and increase income inequality. In the same way, remittance inflows may also increase income inequality. On the other hand, literacy rate and educational attainments would help the marginal segment of society to raise their income level and could help to reduce income inequality. Therefore, we hypothesize the negative effect of the literacy rate and positive effects of inflation and remittances on the income inequality in Pakistan. We test all the hypothesized relationships using a maximum range of available data.

2. Literature Review

This section shares the insights of scholars who have researched absolute and relative poverty. For this purpose, we designed two sub-sections. One discusses the role of macroeconomic factors in determining absolute poverty. The second highlights the role of macroeconomic factors in finding relative poverty through income inequality.

2.1. The Impact of Macroeconomic Factors on Poverty

In a study, Shahbaz et al. [7] tested poverty dynamics due to urbanization in Pakistan. The study considered the Autoregressive Distributed Lag (ARDL) model and found a negative and significant impact of urbanization on poverty. The study further exposed that urbanization was leaving a noticeable impact on alleviating poverty in the short run. In contrast, it left a negligible impact on reducing poverty in the long run. Afterward, Kalim and Hassan [8] applied the ARDL model and disclosed that development spending significantly reduced poverty in the long run while military spending significantly elevated Pakistan's poverty. Satti et al. [9] examined the role of remittances inflow and growth on poverty in Pakistan. The study used the ARDL model on the sample from 1978–2011 and demonstrated a negative and significant impact of economic growth and remittances inflows on poverty. The results further provided evidence of bidirectional causality between growth and poverty.

Meo et al. [10] applied the Nonlinear ARDL (NARDL) technique on data series from 1970 to 2016 in Pakistan. The study provided evidence of a nonlinear association between poverty and its factors, such as inflation and unemployment. The results further exposed that the size of negative coefficients of inflation and unemployment was lesser than their corresponding positive coefficients. Arshad et al. [11] examined the impact of aggregated and disaggregated inflation on Pakistan's poverty and poverty gap. After using the ARDL model on the sample from 1982–2015, the study presented a positive and significant impact of aggregated price level on poverty. The findings related to disaggregated price levels on both absolute and relative poverty were found mixed. Afterward, Meo et al. [12] used the NARDL approach on a sample from 1984 to 2016 for Pakistan and found asymmetric relation between poverty and its determinants like unemployment and governance. The study

further disclosed that the positive changes in unemployment and governance had more significant impacts on poverty than negative changes in unemployment and governance.

Rodriguez [13] investigated the per capita household expenditures and international tourism nexus for the Mexican economy. The study used per capita household expenditures as a proxy for poverty. The study found a positive effect of international tourism on per capita household expenditures and concluded that international tourism increased poverty in Mexico. Alam et al. [14] explored poverty's determinants by using the ARDL on a sample period ranging from 1974 to 2018 in India and found the positive and significant impacts of national income, gross domestic savings, and population on poverty while gross capital formation left a negative impact. Tombolotutu et al. [15] found that unemployment was responsible for increasing poverty, and the literacy rate showed an insignificant effect. An increase in employment caused a decrease in poverty, and increased employment caused income equality. In the same line, the literature signified that employed people have higher income, which means higher purchasing power than the unemployed [16,17].

Kheir [18] investigated the impact of Financial Market Development (FMD) on poverty in Egypt. The study considered the ARDL model for the sample period from 1980 to 2015 and found the significant role of FMD and money supply in reducing Egypt's poverty. In another study, Khan and Majeed [19] explored the impact of aggregated and disaggregated globalization on poverty for 113 countries of the world. The study used various panel estimators on a sample period from 1980 to 2014 and found that aggregated globalization, economic and social globalization in disaggregated globalization and urbanization significantly increased poverty, while political globalization as a disaggregated measure of globalization was witnessed in reducing poverty. Liddle [20] investigated the role of economic growth and urbanization. The study found that economic growth helped to reduce poverty. However, urbanization showed a nonlinear effect. The initial urbanization helped to reduce poverty, but later urbanization at a higher level increased poverty.

The under-mentioned literature is an attempt to cover the effects of governance on income inequality and poverty. For instance, Jindra and Vaz [21] examined the effect of governance on poverty. Their results revealed that governance had a negative effect on multidimensional poverty. Moreover, governance helped to reduce the horizontal inequalities in middle-income countries. However, these effects were not statistically significant in the case of low-income countries. Aloui [22] explored the governance and poverty nexus. The results showed that governance indicators had mixed effects on poverty in sub-Saharan African countries in different development stages. The governance and poverty nexus was positive in Central and Eastern Africa, statistically insignificant in Southern Africa, and negative in West Africa. Hence, governance helped to reduce poverty in poor regions. Asongu and Kodila-Tedilka [23] investigated different dimensions of institutional quality and poverty. The results showed that other than regulatory quality, all other institutional qualities negatively affected multidimensional poverty. Hassan et al. [24] showed the role of different institutional quality dimensions proposed by worldwide governance indicators on alleviating the poverty gap in developing countries. Further assessing the role of institutional quality in social development, Arshed et al. [25] confirmed that institutional quality ensured people's happiness in Asia.

2.2. The Impact of Macroeconomic Factors on Income Inequality

Shahbaz and Islam [26] explored the effect of FMD on income inequality in Pakistan. They used ARDL on a sample from 1971 to 2005 and found that FMD significantly reduced income inequality. Similar results were witnessed for manufacturing value addition and inflation. Moreover, trade openness, Gross Domestic Product (GDP) per capita, and government size significantly enhanced income inequality. Munir and Sultan [27] examined the role of macroeconomic factors in determining income inequality in India and Pakistan, applying a fixed effect model on a data series from 1973–2015. The study found that GDP, globalization, and urbanization significantly expanded income inequality while

government final consumption expenditures, agriculture value-added, and per capita arable land significantly reduced income inequality in India and Pakistan.

Lee et al. [28] examined the factors that cause Korea's income inequality, using different model specifications and a sample period from 1980 to 2012. The study disclosed an absence of both Barro's U-shaped and Kuznets inverted U-shaped hypotheses in Korea. The findings further exposed that the growth rate of the Consumer Price Index (CPI) significantly reduced income inequality in 12 out of 14 specifications, while a similar finding was witnessed in the case of investments for 7 out of 10 specifications. The study also highlighted that imports significantly enhanced income inequality in 6 out of 6 specifications, while similar results were found in the case of the share of the old age population in 14 out of 14 specifications. Lastly, this study also provided the expansionary role of exports for income inequality in 3 out of 4 estimated models in Korea. Arshed et al. [29] investigated a nonlinear impact of education stock on income inequality for 31 developing economies from 1960 to 2015. This study provided evidence of an inverted U-shaped relationship between all investigated education levels and income inequality in the selected Asian countries.

Deyshappriya [30] explored factors influencing income inequality in 33 Asian economies. Using a period from 1990 to 2013, the study exposed a nonlinear relationship between GDP and income inequality. The results further disclosed that growth redistributed income from bottom to middle and top 20%. Afterward, GDP increased the income redistribution from top to middle and bottom 20% of the population. The study also showed a positive and significant impact of political risks, unemployment, inflation, and terms of trade on income inequality, while participation in the labor force, official development aid, and education significantly reduced income inequality. Ganaie et al. [31] used the ARDL from 1960–2007 and found a negative impact of per capita GDP and government expenditures on India's income inequality. The coefficients of trade openness and agriculture showed that both indicators significantly reduced inequality while the coefficient of CPI was expanding the gap between rich and poor in the long run. The study further reported that trade openness and the agriculture sector significantly reduced the top 1% population's income in the long and short run. In comparison, GDP and inflation significantly elevated the top 1% population's income in the long run.

Shahbaz et al. [32] tested the Greenwood–Jovanovich (GJ) hypothesis for the Iranian economy. The study applied the ARDL and confirmed the GJ hypothesis for the Iranian economy and showed a nonlinear relationship between FMD and income inequality and between globalization and income inequality. Using panel cointegration on a sample period from 1961 to 2017 for 21 emerging economies, Nguyen et al. [33] confirmed the GJ Hypothesis's evidence in pre-tax and post-tax income samples. The study showed that FMD and inequality had an inverted U-shaped relationship. Destek et al. [34] scrutinized the GJ hypothesis after employing the ARDL from 1990–2015 for the Turkish economy. The study found that income inequality decreased due to an increase in growth and government spending. The results further exposed a positive and significant impact of inflation on income inequality. Moreover, an inverted U-shaped relationship was also witnessed between FMD and inequality in Turkey. Inflation was crucial for the whole economy, and especially it was not very pleasant for a fixed income group, and it reduced the consumers' purchasing power. In a dynamic analysis, Seo et al. [35] investigated a sample of 43 countries for a period 1991–2014. They corroborated that income inequality was harmful in both developed and developing countries, reducing investment and economic growth.

Skare and Stjepanovic [36] investigated the role of different macroeconomic factors in determining income inequality in 200 countries from 2000 to 2005. After using the panel data technique, the study found that employment in 5 out of 7 equations and population in 7 out of 8 equations significantly enhanced income inequality. At the same time, CPI and the labor force showed mixed findings where both were decreasing inequality in 3 out of 7 cases, and both were increasing inequality in 4 out of 7 cases. The results further exposed that per capita GDP significantly curtailed inequality while unemployment carried mixed

findings. Unemployment in 4 out of 6 equations was accelerating inequality, and in 2 out of 6 equations, it was diminishing inequality. Literature has also focused on the governance and income inequality relationship. For instance, Law and Soon [37] consider the effect of inflation on income inequality and found that inflation increased income inequality. Moreover, institutional quality helped to reduce it. Huang and Ho [38] highlighted the relationship between governance on income inequality in Asia and found that democracy helped reduce emerging countries' income inequality.

The above literature trail on poverty and income inequality ignores the importance of democratic accountability and portfolio investment concerning poverty and income inequality. After reviewing the literature, we may observe that the effects of governance on poverty and income inequality are scant in global literature and absent in Pakistan's case. Moreover, the disaggregated role of political risk components like the investment portfolio index and democratic accountability index in determining absolute and relative poverty is absent to the best of our knowledge. Therefore, this study is unique in considering the importance of democratic accountability and portfolio investment in determining poverty and income inequality in Pakistan.

3. Data, Model, and Methodology

This study analyzes the impact of the investment portfolio, democratic accountability, remittances, urban to rural ratio, inflation, employment, and literacy rate on poverty and income inequality. Our empirical analysis is based on annual time series data and ranges from 1984 to 2019. The data sources and descriptions are mentioned in Table 1.

Table 1. Variable Representation and Construction.

Variable Representation	Variable Construction	Variable Names	Data Source	Sample Period
$lnPOV_t$	ln (Head Count Ratio)	Poverty	Jamal [39], Amjad [40] and Government of Pakistan [41]	1984–2019
$lnGINI_t$	ln (GINI Coefficient)	Income Inequality	Government of Pakistan [41]	1984–2019
IP_t	Investment Portfolio Index	Investments	International Country Risk Guide [42]	1984–2019
DA_t	Democratic Accountability Index	Political Accountability	International Country Risk Guide [42]	1984–2019
$lnCPI_t$	ln (CPI)	Inflation	World Bank [43]	1984–2019
$lnURBRUR_t$	ln (Urban Population/Rural Population)	Urban to Rural Population Ratio	World Bank [43]	1984–2019
$lnEMP_t$	ln(Employment Rate)	Employment Level	Government of Pakistan [41]	1984–2019
$lnREMIT_t$	ln (Remittances/GDP)	Remittances	World Bank [43]	1984–2019
$lnLIT_t$	ln (Literacy Rate)	Literacy Level	Government of Pakistan [41]	1984–2019

Note: *t* represents time series.

The general form of models for the analyses are given below:

$$lnPOV_t = \beta_0 + \beta_1\, IP_{t-1} + \beta_2\, DA_{t-1} + \beta_3\, lnCPI_{t-1} + \beta_4\, lnURBRUR_{t-1} + \beta_5\, lnEMP_{t-1} + e_{1t} \quad (1)$$

$$lnGINI_t = \beta_0 + \beta_1\, IP_{t-1} + \beta_2\, DA_{t-1} + \beta_3\, lnCPI_{t-1} + \beta_4\, lnREMIT_{t-1} + \beta_5\, lnLIT_{t-1} + e_{2t} \quad (2)$$

Equation (1) shows that poverty ($lnPOV_t$) is a function of investment portfolio (IP_t), democratic accountability (DA_t), inflation ($lnCPI_t$), urban to rural ratio ($lnURBRUR_t$) and employment ($lnEMP_t$). Equation (2) describes that Income Inequality ($lnGINI_t$) depends on investment portfolio (IP_t), democratic accountability (DA_t), inflation ($lnCPI_t$), remittances

($\ln REMIT_t$) and literacy rate ($\ln LIT_t$). The subscript "t" represents time, and e shows the error term.

The unit root is tested by applying the Ng-Perron unit root test of Ng and Perron [44]. Before applying the ARDL approach to cointegration, bound testing is required for further estimation procedures. The present study uses the ARDL approach of Pesaran et al. [45]. Lagged values of the explanatory variable are used in the model. Major diagnostic tests like normality test, heteroscedasticity test, serial correlation, and functional form test are applied. Lastly, CUSUM and CUSUMsq tests are also applied to verify the stability of the model. The equations of an ARDL model are specified as:

$$\begin{aligned}\Delta\,(\ln POV)_t = {} & \beta_0 + \beta_1(\ln POV)_{t-1} + \beta_2\,(IP)_{t-1} + \beta_3\,(DA)_{t-1} + \beta_4\,(\ln CPI)_{t-1} + \beta_5\,(\ln URBRUR)_{t-1} \\ & + \beta_6\,(\ln EMP)_{t-1} + \sum_{i=1}^{n}\delta_i\,\Delta\,(IP)_{t-i} + \sum_{i=0}^{n}\varepsilon_i\,\Delta\,(DA)_{t-i} + \sum_{i=0}^{n}\psi_i\,\Delta\,(\ln CPI)_{t-i} \\ & + \sum_{i=0}^{n}\eta_i\,\Delta\,(\ln URBRUR)_{t-i} + \sum_{i=0}^{n}\gamma_i\,\Delta(\ln EMP)_{t-i} + U_{1t}\end{aligned} \tag{3}$$

$$\begin{aligned}\Delta\,(\ln GINI)_t = {} & \beta_0 + \beta_1(\ln GINI)_{t-1} + \beta_2\,(IP)_{t-1} + \beta_3\,(DA)_{t-1} + \beta_4\,(\ln CPI)_{t-1} + \beta_5\,(\ln REMIT)_{t-1} \\ & + \beta_6\,(\ln LIT)_{t-1} + \sum_{i=1}^{n}\delta_i\,\Delta\,(IP)_{t-i} + \sum_{i=0}^{n}\varepsilon_i\,\Delta\,(DA)_{t-i} + \sum_{i=0}^{n}\psi_i\,\Delta\,(\ln CPI)_{t-i} \\ & + \sum_{i=0}^{n}\eta_i\,\Delta\,(\ln REMIT)_{t-i} + \sum_{i=0}^{n}\gamma_i\,\Delta(\ln LIT)_{t-i} + U_{2t}\end{aligned} \tag{4}$$

$$\begin{aligned}\Delta\,(\ln POV)_t = {} & \beta_0 + \sum_{i=1}^{n}\delta_i\,\Delta\,(\ln POV)_{t-i} + \sum_{i=1}^{n}\varepsilon_i\,\Delta\,(IP)_{t-i} + \sum_{i=1}^{n}\psi_i\,\Delta\,(DA)_{t-i} + \sum_{i=1}^{n}\theta_i\,\Delta\,(\ln CPI)_{t-i} \\ & + \sum_{i=1}^{n}\eta_i\,\Delta(\ln URBRUR)_{t-i} + \sum_{i=1}^{n}\gamma_i\,\Delta\,(\ln EMP)_{t-i} + \lambda\,(ECM)_{t-1} + U_t\end{aligned} \tag{5}$$

$$\begin{aligned}\Delta\,(\ln GINI)_t = {} & \beta_0 + \textstyle\sum_{i=1}^{n}\delta_i\,\Delta\,(\ln GINI)_{t-i} + \sum_{i=1}^{n}\varepsilon_i\,\Delta\,(IP)_{t-i} + \sum_{i=1}^{n}\psi_i\,\Delta\,(DA)_{t-i} + \\ & \textstyle\sum_{i=1}^{n}\theta_i\,\Delta\ln(\ln CPI)_{t-i} + \sum_{i=1}^{n}\eta_i\,\Delta\ln REMIT_{t-i} + \sum_{i=1}^{n}\gamma_i\,\Delta\,(\ln LIT)_{t-i} + \lambda\,(ECM)_{t-1} + U_t\end{aligned} \tag{6}$$

The coefficients of lagged level variables in Equations (3) and (4) can be normalized to find the explanatory variables' long-run effects. The coefficients of lagged differenced variables in Equations (5) and (6) would be interpreting the short-run effects.

4. Results and Discussions

In Table 2, the value of standard deviation for each variable explains the average divergence of individual values from their mean value. Skewness and Kurtosis were calculated, and the values of all variables range from 0 to 3, representing the normal distribution except $\ln EMP_t$. To confirm the joint-significant difference from 0 to 3, this study employed the Jarque–Bera test to test variable normality [46]. All variables other than $\ln EMP_t$ were normally distributed. This study avails the central limit theorem to assume the asymptotic normality of $\ln EMP_t$.

Table 2. Descriptive Statistics.

Variables	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability	Observations
$lnPOV_t$	3.4217	0.1425	−0.0756	1.8949	1.866	0.3934	36
$lnGINI_t$	3.6333	0.0945	0.5929	2.0196	3.5505	0.1694	36
IP_t	0.6	0.166	−0.0862	1.9901	1.5745	0.4551	36
DA_t	0.5094	0.3107	0.3389	1.9866	2.2298	0.3279	36
$lnCPI_t$	3.8602	0.8463	−0.0004	1.7997	2.161	0.3394	36
$lnURBRUR_t$	−7.0315	1.0497	−0.1637	1.8669	2.0867	0.3523	36
$lnEMP_t$	3.9187	0.0339	−4.7296	26.5022	962.748	0.0000	36
$lnREMIT_t$	1.4905	0.4925	−0.6003	2.5727	2.436	0.2958	36
$lnLIT_t$	3.8336	0.2701	−0.401	1.8195	3.0557	0.2170	36

4.1. Cointegration Analyses

Once the data are assessed based on descriptive stats, the next step is to apply the unit root test to check if the time series is stationary or not. In order to obtain reliable time series results, the time series data should be stationary. We used the Ng–Perron unit root test to see whether the series or its difference are stationary or not. Ng and Perron [44] constructed four Generalized Least Square (GLS) based test statistics, MZ_a, MZ_t, MSB, and MPT, to identify the unit root. It is an improved version of Phillips and Perron [47]. If the absolute values of test statistic MZ_a are larger than the absolute critical values. Then, we may reject the null hypothesis. Table 3 presents the results at the level and first difference. We can see that the values for MZ_a are greater than the critical values in the case of IP_t, DA_t, and $lnEMP_t$ at their level. Hence, these variables are level-stationary. Moreover, values of MZ_a are larger than critical values for all differenced variables. Based on these results, we found a mixed order of integration in both the poverty and income inequality models.

Table 3. Ng–Perron test results.

Variables	Unit Root Test at Level			
	MZ_a	MZ_t	MSB	MPT
$lnPOV_t$	−1.641	−0.768	0.468	12.643
$lnGINI_t$	−1.193	−0.520	0.436	13.027
IP_t	−8.372	−1.907	0.228	3.435
DA_t	−11.498	−2.190	0.190	2.905
$lnCPI_t$	1.765	3.299	1.869	261.820
$lnURBRUR_t$	0.451	0.262	0.581	25.414
$lnEMP_t$	−18.400	−3.032	0.165	1.337
$lnREMIT_t$	−3.713	−1.316	0.355	6.612
$lnLIT_t$	0.766	0.623	0.813	46.128
Variables	**Unit Root Test at First Difference**			
	MZ_a	MZ_t	MSB	MPT
$lnPOV_t$	−16.106	−2.797	0.174	1.671
$lnGINI_t$	−14.106	−2.645	0.188	1.778
IP_t	−24.558	−3.495	0.142	1.029
DA_t	−16.958	−2.911	0.172	1.447
$lnCPI_t$	−9.461	−2.137	0.226	2.734
$lnURBRUR_t$	−5.836	−1.704	0.292	4.209
$lnEMP_t$	−26.137	−3.615	0.138	0.937
$lnREMIT_t$	−24.843	−3.505	0.141	1.050
$lnLIT_t$	−14.623	−2.691	0.184	1.725

The critical values for MZ_a statistic at 1, 5, and 10 percent level of significance are −13.8, −8.1, and −5.7, respectively.

Table 4 presents the results of ARDL bound testing. F-statistic values were found to be greater than the upper bounds at 5%, that is, 5.9897 > 4.4795 in the poverty model

and 5.9195 > 4.4795 in the model of income inequality. We can conclude the cointegration in both poverty and income inequality models. The diagnostic tests are also presented in Table 4, including serial correlation, functional form, normality, and heteroscedasticity. All diagnostic tests' probability values are higher than 0.1 in both models of poverty and income inequality. Hence, we accept all the above-said diagnostics' null hypotheses and conclude that the results are robust.

Table 4. Bound Test.

Estimated Models	Poverty	Income Inequality
Optimal lags	(1,2,1,1,0,0)	(1,0,0,0,1,0)
F–statistics	5.9897	5.9195
Significance Level	Critical Bounds For F–Statistics	
	Lower Critical Bound	Upper Critical Bound
5 percent	3.0566	4.4795
10 percent	2.5336	3.3770
	Diagnostic Tests	
R^2	0.9544	0.9809
Adjusted–R^2	0.9346	0.9757
F–Statistics	48.13 [0.000]	190.27 [0.000]
DW–Statistic	2.2564	1.7991
Serial Correlation	2.1410 [0.143]	0.4341 [0.510]
Functional Form	2.1309 [0.144]	1.9838 [0.159]
Normality	0.3728 [0.830]	1.2895 [0.525]
Heteroscedasticity	0.0073 [0.932]	1.2827 [0.257]

[] represents Probability Values.

In Table 5, the long and short-run results of the poverty model reveal that the investment portfolio coefficient (IP_t) shows a negative and statistically significant sign in the long and short run. It is indicating that the increasing investment portfolio in Pakistan has a crucial role in decreasing poverty. Democratic accountability (DA_t) also has a negative and statistically significant effect on poverty, as democratic accountability tends to be weak in many developing countries like Pakistan. If the government in a developing country does not fulfill its promises as per manifestoes, it will not be reelected in the new elections. Nevertheless, the finding is as per our expectations that when democratic accountability is strengthened, the government would deliver as per their manifesto and try all possible efforts to condense poverty and improve income distribution in the country. This finding is a guide that helps many other economies to hold accountable their democracies for improving social sustainability such as cutting down poverty and controlling income disparity between the rich and the poor. The coefficient of $lnCPI_t$ is positive and significant. Hence, increasing inflation may increase poverty by 0.63% and income inequality by 0.36% in the long run and vice versa for decreasing inflation. The finding of inflation for income inequality is consistent with Ganaie et al. [31] and Destek et al. [34]. The role of the urban to rural ratio is also indispensable in case of poverty. The coefficient of urban to rural ratio carries a negative sign in the short and long run. Hence, 1% increasing urban to rural population ratio may reduce 0.34% poverty level in the long run. Lastly, the impact of employment on poverty is negative but statistically insignificant in the long and short run. The coefficient value (−0.94) of Error Correction Term (ECT_{t-1}) is negative and shows a convergence speed toward long-run equilibrium in almost one year and one month.

Table 5. Coefficients for the selected ARDL Model.

Variable	Poverty	Income Inequality
	Coefficients	**Coefficients**
	Long Run	
IP_t	−0.2259 [0.010]	−0.0967 [0.140]
DA_t	−0.1326 [0.002]	−0.0881 [0.097]
$lnCPI_t$	0.6267 [0.000]	0.3591 [0.000]
$lnURBRUR_t$	−0.3379 [0.003]	–
$lnEMP_t$	−0.2292 [0.371]	–
$lnREMIT_t$	–	0.1213 [0.000]
$lnLIT_t$	–	−0.8421 [0.002]
Intercept	−0.2650 [0.845]	5.4014 [0.000]
	Short Run	
ΔIP_t	−0.2647 [0.003]	−0.0406 [0.161]
ΔIP_{t-1}	0.2051 [0.011]	–
ΔDA_t	−0.01601 [0.778]	−0.0340 [0.062]
$\Delta lnCPI_t$	0.4472 [0.037]	0.1506 [0.001]
$\Delta lnURBRUR_t$	−0.3166 [0.004]	–
$\Delta lnEMP_t$	−0.2147 [0.324]	–
$\Delta lnREMIT_t$	–	0.0307 [0.059]
$\Delta lnLIT_t$	–	−0.3532 [0.003]
ECT_{t-1}	−0.9369 [0.000]	−0.4194 [0.000]
	Diagnostics	
R^2	0.7035	0.6599
Adjusted-R^2	0.5746	0.5684
F–Statistics	7.7951 [0.000]	8.4094 [0.000]
Akaike Information Criterion	60.6942	90.7886
Schwarz Bayesian Criterion	52.2993	84.6832
DW–Statistic	2.2564	1.7991

The results of the income inequality model are also displayed in Table 5. The results reveal that the investment portfolio's coefficient has a negative sign but is statistically insignificant both in the long and short run. Hence, there is no evidence of a relationship between portfolio investment and income inequality. The coefficient of democratic accountability is negative and statistically significant in both the long and short run. Hence, increasing democratic accountability helps to reduce income inequality in Pakistan. In another interpretation, decreasing democratic accountability would increase income inequality. The literacy rate has a large negative effect on income inequality. The coefficient of $lnLIT_t$ shows that a 1% increase in literacy rate could reduce 0.84% of the income inequality in the long run. Hence, increasing the literacy rate may play a significant role in reducing income inequality. This relationship behaves the same way in the short and long run. The long and short-run coefficients of inflation and remittance are positive and statistically significant. Hence, the increasing inflation and remittance would increase the level of income inequality in Pakistan. The coefficient of $lnCPI_t$ shows that a 1% increase in the consumer price index may increase income inequality by 0.36% in the long run. In contrast, controlling inflation would be beneficial to reducing income inequality. Further, it also corroborates a fact in Pakistan that increasing inflation helps rich people become more prosperous and vice versa. The coefficient of $lnREMIT_t$ shows that 1% increasing remittance would increase income inequality by 0.12% in the long run. On the other hand, decreasing remittance would decrease the level of income inequality. In the short run, the coefficient of ECT_{t-1} (−0.42) shows a convergence toward long-run equilibrium in almost two years and five months. Figure 1 shows the testing of the stability of the selected ARDL models.

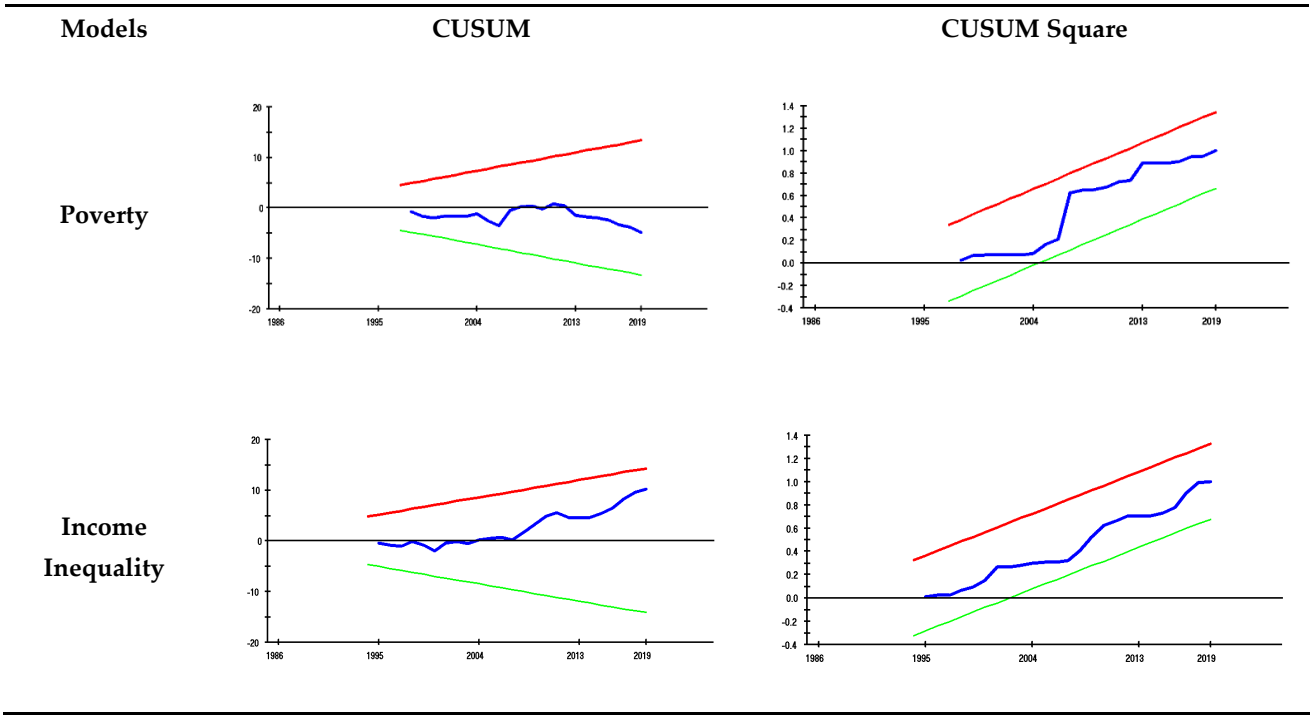

Figure 1. Stability Test for the selected ARDL Models.

We applied the Cumulative Sum (CUSUM) and CUSUM square (CUSUMSQ) tests to check the estimated model's structural stability and report the results in Figure 1. CUSUMSQ is derived from the cumulative sum of squared residuals. Both tests are conducted on a 5% significance level, and critical values are shown in the parallel lines in Figure 1. The parallel lines show lower and upper critical bounds. In the case of both models, the estimated plotted lines are inside the critical bound parallel lines. Hence, we can conclude that there is no change in the process mean, and the estimated results are stable. In other words, neither test rejects the null hypothesis of stable coefficients.

4.2. Simulation-Based Prediction of Poverty and Income Inequality

After estimating the long effects from ARDL, we substituted the long-run slope coefficients of the poverty model mentioned in Table 5, in Equation (1) mentioned in Section 3, to get Equation (7). Moreover, we also put the average values of independent variables in Equation (8) and found the estimated value of poverty in Equation (9).

$$\begin{aligned}\ln\hat{POV}_t = {} & -0.2650 - 0.2259 \times \overline{(IP_t)} - 0.1326 \times \overline{(DA_t)} + 0.6267 \times \overline{(\ln CPI_t)} \\ & -0.3379 \times \overline{(\ln URBRUR_t)} - 0.2259 \times \overline{(\ln EMP_t)}\end{aligned} \quad (7)$$

$$\begin{aligned}\ln\hat{POV}_t = {} & -0.2650 - 0.2259 \times (0.600) - 0.1326 \times (0.5094) + 0.6267 \times (3.8602) \\ & -0.3379 \times (-7.0315) - 0.2259 \times (3.9187)\end{aligned} \quad (8)$$

$$\ln\hat{POV}_t = 3.4418 \quad (9)$$

To reach the desirable equation to find the predicted values of poverty, we may use the simulated mean values of an investment portfolio or democratic accountability or both at different percentage levels ranging from 0% to 10%. For this purpose, we substituted mean values of all the independent variables except mean values of the investment portfolio and democratic accountability in Equation (7) in the following way:

$$\ln\hat{POV}_t = -0.2650 - 0.2259 \times [\overline{(IP_t)} + m \times \overline{(IP_t)}] - 0.1326 \times [\overline{(DA_t)} + n \times \overline{(DA_t)}] + 0.6267 \times (3.8602) - 0.3379 \times (-7.0315) - 0.2259 \times (3.9187) \quad (10)$$

$$\ln\hat{POV}_t = -0.2650 - 0.2259 \times [\overline{(IP_t)} + m \times \overline{(IP_t)}] - 0.1326 \times [\overline{(DA_t)} + n \times \overline{(DA_t)}] + 2.4192 + 2.3759 - 0.8852 \quad (11)$$

$$\ln\hat{POV}_t = 3.6449 - 0.2259 \times [\overline{(IP_t)} + m \times \overline{(IP_t)}] - 0.1326 \times [\overline{(DA_t)} + n \times \overline{(DA_t)}] \quad (12)$$

The values of "m" and "n" may range from 0% to 10%. Based on Equation (12), we may predict poverty by simulating the mean values of the investment portfolio from 0% to 10%, keeping the mean value of democratic accountability fixed at 0% (n = 0). The results are presented in column 4 of Table 6. Similarly, the values of poverty are predicted by keeping the mean value of the investment portfolio fixed at 0% (m = 0) and using simulated mean values of democratic accountability from 0% to 10%. The results are reported in column 5 of Table 6. Moreover, we utilized the simulated mean values of investment portfolios and democratic accountability from 0% to 10% to predict poverty. The results are presented in column 6 of Table 6.

Table 6. Simulation-based Prediction of Poverty.

Percentage Increase in IP_t and DA_t	Simulated Mean Values of IP_t	Simulated Mean Values of DA_t	Percentage Increasing IP_t, Keeping DA_t Constant	Percentage Increasing DA_t, Keeping IP_t Constant	Percentage Increasing IP_t and DA_t
Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**	**Column 6**
0%	−0.1355	−0.0675	3.4418	3.4418	3.4418
1%	−0.1369	−0.0682	3.4405	3.4411	3.4398
2%	−0.1383	−0.0689	3.4391	3.4405	3.4378
3%	−0.1396	−0.0696	3.4377	3.4398	3.4357
4%	−0.1410	−0.0702	3.4364	3.4391	3.4337
5%	−0.1423	−0.0709	3.4350	3.4384	3.4317
6%	−0.1437	−0.0716	3.4337	3.4378	3.4296
7%	−0.1450	−0.0723	3.4323	3.4371	3.4276
8%	−0.1464	−0.0730	3.4310	3.4364	3.4256
9%	−0.1477	−0.0736	3.4296	3.4357	3.4235
10%	−0.1491	−0.0743	3.4283	3.4351	3.4215

It is concluded from column 4 in Table 6 that the predicted value of poverty decreases from 3.4418 percent to 3.4283 percent with the increasing mean value of the investment portfolio from 0% to 10%, keeping constant the role of the mean values of other variables at 0%. Column 5 demonstrates the decreasing predicted values of poverty from 3.4418 percent to 3.4351 percent due to the increasing mean value of democratic accountability from 0% to 10%, keeping the constant effect of all the other factors at 0%. Column 6 represents the decreasing behavior of the predicted values of poverty from 3.4418 percent to 3.4215 percent in response to increasing mean values of both investment portfolio and democratic accountability, considering the constant effect of all other variables at 0%.

We repeated all the above simulation procedures on the income inequality model. We substituted the long-run slope coefficients of the income inequality model mentioned in Table 5, in Equation (2) mentioned in Section 3, to approach Equation (13). Moreover, we put the average values of independent variables in Equation (14) and found the estimated value of income inequality in Equation (15).

$$\ln\hat{GINI}_t = 5.4014 - 0.0967 \times \overline{(IP_t)} - 0.0881 \times \overline{(DA_t)} + 0.3591 \times \overline{(\ln CPI_t)} + 0.1213 \times \overline{(\ln REMIT_t)} - 0.8421 \times \overline{(\ln LIT_t)} \quad (13)$$

$$\ln\hat{GINI}_t = 5.4014 - 0.0967 \times (0.600) - 0.0881 \times (0.5094) + 0.3591 \times (3.8602) + 0.1213 \times (1.491) - 0.8421 \times (3.834) \quad (14)$$

$$\ln\hat{GINI}_t = 3.6369 \quad (15)$$

Next, we find the predicted values of income inequality. To serve the purpose, we substituted the mean values of all the independent variables except the mean values of the investment portfolio and democratic accountability in Equation (13). Afterward, we may substitute the simulated mean values of the investment portfolio or democratic accountability, or both at various percentage levels ranging from 0% to 10%. The procedure is as follows:

$$\ln\hat{GINI}_t = 5.4014 - 0.0967 \times [\overline{(IP_t)} + m \times \overline{(IP_t)}] - 0.0881 \times [\overline{(DA_t)} + n \times \overline{(DA_t)}] + 0.3591 \times (3.8602) + 0.1213 \times (1.491) - 0.8421 \times (3.834) \quad (16)$$

$$\ln\hat{GINI}_t = 5.4014 - 0.0967 \times [\overline{(IP_t)} + m \times \overline{(IP_t)}] - 0.0881 \times [\overline{(DA_t)} + n \times \overline{(DA_t)}] + 1.3862 + 0.1809 - 3.2286 \quad (17)$$

$$\ln\hat{GINI}_t = 3.7398 - 0.0967 \times [\overline{(IP_t)} + m \times \overline{(IP_t)}] - 0.0881 \times [\overline{(DA_t)} + n \times \overline{(DA_t)}] \quad (18)$$

The values of "m" and "n" may range from 0% to 10%. Based on Equation (18), we may predict income inequality by simulating the mean values of the investment portfolio from 0% to 10%, keeping the mean value of democratic accountability fixed at 0% (n = 0). The results are presented in column 4 of Table 7. By keeping the mean value of the investment portfolio fixed at 0% (m = 0), the values of income inequality are predicted by simulating the mean values of democratic accountability from 0% to 10%. The results are reported in column 5 of Table 7. Moreover, we used simulated mean values of both investment portfolio and democratic accountability from 0% to 10% to predict the income inequality, and the results are presented in column 6 of Table 7.

Table 7. Simulation-Based Prediction of Income Inequality.

Percentage Increase in IP_t and DA_t	Simulated Mean Values of IP_t	Simulated Mean Values of DA_t	Percentage Increasing IP_t, Keeping DA_t Constant	Percentage Increasing DA_t, Keeping IP_t Constant	Percentage Increasing IP_t and DA_t
Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**	**Column 6**
0%	−0.0580	−0.0449	3.6369	3.6369	3.6369
1%	−0.0586	−0.0453	3.6363	3.6365	3.6359
2%	−0.0592	−0.0458	3.6357	3.6360	3.6348
3%	−0.0598	−0.0462	3.6352	3.6356	3.6338
4%	−0.0603	−0.0467	3.6346	3.6351	3.6328
5%	−0.0609	−0.0471	3.6340	3.6347	3.6318
6%	−0.0615	−0.0476	3.6334	3.6342	3.6307
7%	−0.0621	−0.0480	3.6328	3.6338	3.6297
8%	−0.0627	−0.0485	3.6323	3.6333	3.6287
9%	−0.0632	−0.0489	3.6317	3.6329	3.6276
10%	−0.0638	−0.0494	3.6311	3.6324	3.6266

Table 7 shows the results in column 4 that the predicted values of income inequality decrease from 3.6369% to 3.6311% with the increase in the mean simulated value of the investment portfolio from 0% to 10%, keeping constant the mean values of other variables at 0%. Column 5 demonstrates that the predicted values of income inequality decrease from 3.6369 percent to 3.6324 percent due to the increasing mean value of democratic accountability from 0% to 10%, keeping constant the effect of the mean values of all the other factors at 0%. Column 6 represents the decreasing behavior of the predicted values of income inequality from 3.6369 percent to 3.6266 percent due to increasing mean values of

both investment portfolio and democratic accountability from 0% to 10%, considering the constant effect of the mean values of all other variables at 0%.

5. Conclusions and Policy Recommendations

Pakistan is facing problems of poverty and income inequality since her independence. In this context, governance is crucial to improve the social sustainability of the country. The governance of any country is essential because it may increase individuals' security and bring development and prosperity to the economy. This present study analyzes the impact of governance on poverty and income inequality in a developing country, Pakistan, using a period from 1984–2019 and the ARDL approach to cointegration. The study's findings reveal that increasing investment portfolio and democratic accountability play an influential role in reducing poverty in Pakistan both in the long and short-run and vice versa. Further, democratic accountability has a significant role in reducing income inequality in Pakistan. However, the effect of the investment portfolio was found to be statistically insignificant on income inequality. Moreover, all the control variables show the expected effects on poverty and income inequality, which align with the theory. For example, the literacy rate has a negative effect on income inequality. Hence, the increasing literacy rate would help to redistribute income fairly among the population. Inflation has a positive effect on both poverty and income inequality. It shows that increasing inflation enhances Pakistan's poverty and income inequality, and decreasing inflation may reduce poverty and income inequality. It is an eye-opener to the policy advisors that inflation could damage social sustainability by worsening poverty and income inequality indicators in Pakistan. Moreover, remittance inflows have a positive effect on income inequality. Hence, remittance inflows are increasing income inequality. Lastly, the urban to rural population has a negative effect on poverty. Hence, urbanization helps to reduce poverty.

Based on the results reported in Tables 5–7, both governance indicators, the investment portfolio and democratic accountability, help to control social issues such as poverty and income inequality. By simulating both measures of governance, we corroborate that both issues can be controlled. Hence, there is a dire need to target both investment portfolio and democratic accountability for reducing poverty and improving income distribution in Pakistan. Then, it may ensure social sustainability in Pakistan. Besides governance measures, we corroborate that rural to urban migration helps to control poverty, while literacy rate improves income distribution. Therefore, by rationally allocating funds to improve the literacy rate, income distribution can be improved. Moreover, monitoring rural to urban migration to meet required labor in the cities would help to control poverty. We also found that inflation is an important macroeconomic factor that is worsening social sustainability because increasing inflation reduces the purchasing power of people and increases poverty. It may also redistribute income in favor of the rich because inflation would shift the wealth from fixed-salaried labor to the business class. Therefore, serious efforts should be made to control inflation by activating price control committees to maintain the purchasing power of the people in Pakistan. It would improve the standard of living of the people and would also improve income distribution in Pakistan. Further, policies should be designed to manage inflows of remittances to improve income distribution because it is widening the rich-poor gap in Pakistan. These steps would possibly improve social sustainability in Pakistan.

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