THE DYNAMIC EFFECTS OF GOVERNMENT SPENDING SHOCKS ON INCOME AND CONSUMPTION INEQUALITY IN PAKISTAN

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CERTIFICATE

This is to certify that this thesis entitled: **"The Dynamic Effects of Government Spending Shocks on Income and Consumption Inequality in Pakistan"** submitted by **Ms. Zartasha Inayat** is accepted in its present form by the School of Economics, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree in Master of Philosophy in Economics.

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Dedications

To the grieving memory of my mother's love, and to Hira, for always having my back!

Acknowledgements

Abstract

There has been a shift in scholarly focus from understanding the determinants of inequality to understand the role of government in mitigating the inequality. The rise in inequality due to various crisis worldwide has caused the surge in understanding this role further. This study aims to estimate the dynamic effects of government spending shocks on income and consumption inequality in Pakistan. Using Household Integrated Economic Survey data (HIES) from Pakistan, for the time 1999-2019, the study first analyzes the evolution of inequality in Pakistan, followed by estimating the effects of government spending shocks on inequality measures over time using the impulse response functions. The results of the study reveal that inequality in total income and expenditure follows a consistent trend, rising almost equally over time. The effect of spending shock on income and consumption inequality indicate that while consumption and expenditure inequality decline after the positive spending shock, there is no significant impact on the reduction in income inequality. Similarly, for the income components, there is decline in financial inequality while the other components of income largely remain unaffected. There is also a significant decline in a reduction in inequality in interest-sensitive expenditures in response to spending shock. The results indicate that fiscal policy is largely ineffective in reducing income inequality in Pakistan. The government should, thus, focus on providing the targeted subsidies to low income groups, and reform the taxation system. Investment in human capital can have nuanced impacts on reducing the inequality in the long run. The countercyclical policies during the contractionary period can further enhance the economic activity and prevent the economically vulnerable groups to be susceptible to the poor living conditions.

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CHAPTER I

INTRODUCTION

1.1 Introduction

The persistent rise in inequality, in both developed and developing economies, specifically after the great recession in 2008, has been a major concern for academia and policymakers alike. The expanding inequality, marked by increasing disparities in income can pose significant challenges to inclusive economic growth and stability of the economy. To address this challenge of sprouting inequality, the government's role as a socio-economic agent for the redistribution of wealth in society has garnered significant attention as per the recent literature (e.g., Coibion et al., 2017; Cevik and Caro, 2020; Gunasinghe, 2021), as government spending has proven considerably effective in assisting low-income groups and promoting economic growth of the overall economy. For instance, during the global financial crisis of 2008, government spending played a substantial role in reducing income inequality. The noticeable steps taken by the government to protect the low-income groups at the time of crisis were the effective implementation of transfer programs and progressive taxation (Clements, de Mooij, Gupta, & Keen, 2015). Similarly, the government intervention during the recent coronavirus pandemic in 2019 is another noteworthy example of governments worldwide executing transfer payments and other relief packages to mitigate the effects of the pandemic by successfully raising household income (Romer, 2021).

The existing literature on the determinants of inequality and its aggregate level analysis is extensive, however, there is a limited amount of research on policy impact analysis of various government interventions. In recent years, as governments worldwide have responded to crises with interventions in the form of spending, the focus of literature has shifted from understanding

the aggregate causes of inequality to discussing the effectiveness of fiscal spending shocks as an intervention to reduce inequality. However, there is ambiguity on how spending shocks affect inequality, due to the different mechanisms through which these shocks affect households. This study tries to estimate the redistributive effect of government expenditure on both consumption and income inequality, identifies the underlying channels through which the redistributive effects of fiscal spending shocks become evident, as well as quantifies the effect of fiscal expenditure shocks on historical variations in inequality, focusing on the case of Pakistan.

To characterize the redistributive impact of government's spending shocks, this study focuses on understanding the dynamic responses of income and consumption inequality to government spending shocks in Pakistan. This study utilizes different measures of inequality that are derived and calculated using the Household Integrated Economic Survey (HIES). Collected by the Pakistan Bureau of Statistics, HIES is a nationally representative dataset, containing information about the income and consumption of households in Pakistan. It provides comprehensive data on Pakistan's households over the various income and consumption categories (i.e., durables, nondurables, services, wages, business income, and other income) and allows to study the various metrics of inequality (cross-sectional standard deviation, percentile differences of cross-sectional distribution, and the Gini coefficient) for various sub-categories of the income and expenditures of a Pakistani household. For each variable, this study first calculates the above measures of inequality and then estimates the dynamic response of these disparity measures to fiscal shocks.

Fiscal policy is undoubtedly a powerful tool to achieve inclusive economic growth, which could have distributional effects through various government measures e.g., government transfers through social development programs, public investment projects, and non-development expenditures. Fiscal policy is, thus, an effective way to reduce inequality, mitigate poverty, and

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enhance employment opportunities (Zulfiqar, 2018). Literature has studied the impact of both fiscal consolidations and expansions on income and consumption inequality. Studies demonstrate that government expansion can increase the national income, private consumption, real wages, and investment (Weonho, Jan, & Sugata, 2012). This expansion in government spending has proven to translate its effect in reducing income, consumption, and expenditure inequality (Dhital, Jiang, & Reese, 2023). Fiscal consolidations (the government's actions to narrow the fiscal deficit, either by reducing spending or enhancing taxation burden), however, tend to increase income inequality usually caused by tax hikes and/or reductions in government spending. The gap in incomes of rich and poor widens in response to fiscal consolidations, depending on the extent of fiscal consolidations as a percentage of Gross Domestic Product (Agnello & Sousa, 2014). The research has been conducted in Pakistan to analyze the effect of government spending shocks on the macroeconomic variables like unemployment, interest rate, and GDP, etc. (e.g., Yasmin Javid & Arif 2009, Shaheen & Turner, 2019 and Munir & Riaz, 2020). However, the study specifically examining the impacts of spending shocks on income and consumption inequality in the context of Pakistan is scarce. This study intends to fill the gap by evaluating the effect of government spending on micro level. Furthermore, the purpose of the study is to provide evidence on whether government spending in Pakistan has substantial impacts on reducing inequality in Pakistan or not. Thus, the study deals with estimating the distributional impact of spending by government on income and consumption inequality in Pakistan, both at aggregate and disaggregate levels.

Consumption and income inequality measures are used for evaluating consumer welfare, as they offer insights into the resource distribution and well-being of economic agents, particularly the household. Although income inequality has commonly been used as a measure of consumer welfare, consumption is now recognized as a more reliable measure for assessing household

welfare. For instance Meyer and Sullivan (2003) assert that survey data on consumption is less prone to underreporting as compared to income, and it also directly reflects the well-being of individuals. In a contemporary research Meyer, Mok and Sullivan (2015) imply that it is not advisable to use income inequality alone as a measure of inequality, because it can underreport the overall level of inequality. Researchers now also emphasize the importance of using consumption inequality along with income inequality because availability of consumption data and the wider recognition of consumption inequality as a direct measure of well-being. Additionally, consumption inequality may better capture the impact of shocks on welfare, as individuals who save, borrow, or receive support from family members or governments may react differently from those who rely completely on income (Attanasio & Pistaferri, 2016).

Given that HIES provides detailed information about the consumption and income of households, this information can be utilized to calculate several inequality measures of both income and consumption variables. There are many inequality indices used in literature, with each index having its strengths and weaknesses. Following (Coibion, Gorodnichenko, Kueng, & Silvia, 2017) this study employs three measures of inequality; cross-sectional standard deviation of log levels, percentile differences of the cross-sectional distribution of log levels, and the Gini coefficient, to avoid any bias in results. The Gini coefficient, a widely used tool for measuring inequality, provides a single value of inequality, the value ranging between 0 and 1, where 0 value suggests perfect equality and 1 suggests perfect inequality. The Gini coefficient summarizes an entire income distribution, capturing the extent of inequality within the distribution. In contrast, cross-sectional standard deviation measures the dispersion of income around the mean, yet it neglects the entire income distribution. As Cross-sectional standard deviation reduces the sensitivity to outliers, it is preferred over the Gini-coefficient. Moreover, while the Gini coefficient provides a

single value that summarizes the entire income distribution while capturing the extent of inequality within the distribution, the standard deviation measures the accurate and precise dispersion of incomes around the mean, retaining the scale of the data. The final measure of inequality that is used in this study, is the percentile differences of cross-sectional distribution, which focuses on specific points in distribution, such as the difference between 90th and 10th percentiles.

To calculate wages, total income, consumption, and total expenditure inequalities these above mentioned measures are commonly utilized. The approach of using different measures of inequality is necessary to avoid any bias, which may arise due to using only one measure. These measures can be used in combination to provide a retrospective understanding of distribution of resources within a population. To investigate consumption and income inequality, this study will utilize quarterly microdata from HIES which spans from 1999Q4 to 2019Q4.

This study utilizes the Local Projection method (2005) to estimate the impulse response function and to examine the effect of spending shocks on diverse consumption and income inequality measures. The study focuses on quarterly time series data for Government Expenditure, from 1999 to 2019 that is sourced from the Finance Division Pakistan, which will be used to identify spending shocks. The Local Projection method is preferred due to its flexibility and ability to capture the dynamic effects of shocks on different outcomes over a range of horizons. It is also computationally efficient and can be applied to HIES data of Pakistan. The study firstly constructs various metrics of inequality for expenditure and income and then estimates impulse response functions for government spending shocks and their impact on inequality variables.

The purpose of this study is to analyze the effects of government spending shocks on consumption and income disparities in the economic variables for a comprehensive analysis. Subsequently, the study utilizes local projection methods to compute impulse response functions of government

expenditure on income and consumption inequality measures. This approach allows for an understanding of the dynamic effects of government spending on economic disparities, contributing valuable insights into the policymaking for the country.

1.2 Research Problem

The private sector activity often declines during the recession causing the economic slowdown. During these times, governments intervene to rescue the economy from experiencing a downfall and offset this decline by boosting the aggregate demand and specifically preventing the lower-income groups from falling below the poverty line. The government intervenes through different channels during the recessions; either by investing in infrastructure programs and increasing the education and health spending or directly through cash transfers. Instances of such government intervention through the either of these channels could be found in history. The recent crises where governments worldwide provided relief to the economies are the global financial crisis and the coronavirus pandemic.

The coronavirus pandemic had a substantial impact on consumption and income patterns of households across developed and developing countries. The impact has been particularly pronounced on lower income groups, exacerbating the existing inequality. However, the government response during such crisis was crucial and played a vital role in mitigating the disparities. For instance, in the face of recent pandemic, governments around the world has taken aggressive measures by stimulating household incomes, in the form of transfer payments and health expenditures, to protect the low income groups. One such form of extensive fiscal response could also be found from global financial crisis in 2009-10 where government response proved to be effective in supporting households (Makin & Layton, 2021). Thus, the proactive fiscal measures

witnessed during the crisis underscore the role of government intervention in protecting the well-being of vulnerable groups and the overall economy.

When considering the effects of economic crises, Pakistan is not an exception and has experienced the profound impacts of such crises, including the 2005 earthquakes, military regime in the country, war on terror, the 2010 floods, and the coronavirus pandemic followed by the disastrous floods of 2022. Consistent with global trends, households in Pakistan have faced significant challenges in maintaining their incomes and adjusting their consumption patterns in response to the crisis. A study conducted in Pakistan found that 73.92% of surveyed households suffered income shocks as a result of the pandemic (Mehmood, Arshad, & Bashir, 2023). Given the impact of these crises on household incomes and overall economic activity in the country, it is crucial to observe the role of government spending shocks and their influence on consumption and income patterns.

Despite the significant implications of government spending shocks on economic outcomes, policymaking, and political support, there is a noticeable lack of research contextualizing the impacts of fiscal spending on varying consumption patterns and income inequality in Pakistan. This research aims to fill this gap by exploring the effects of government spending shocks on consumption and income inequality. While there has been significant increase in inequality after the coronavirus pandemic and 2022 floods, the available data only extends to 2019, limiting the analysis of the subsequent years.

Based on the problem statement, this study seeks to delve into the dynamic effects of government spending shocks on consumption and income inequality both at aggregate and disaggregate levels.

The underlying research questions and research objectives which will operationalize the study are as follows.

1.3 Research Questions:

1. How do government spending shocks influence household consumption and income inequality over time in Pakistan?

2. What have been the impacts of government spending shocks on historical fluctuations in inequality in Pakistan

1.4 Research Objectives:

1. To compute 3 measures of inequality; Gini Coefficient, Percentile differences of cross-sectional distribution, and Cross Sectional Standard Deviation, and trends of these measures from 1999-2019 in the case of Pakistan using household data obtained from HIES.

2. To estimate the dynamic relationship between government spending shocks and different inequality measures.

3. To explore, at the disaggregate level, which part of total consumption and income is mostly affected by spending shocks to discuss the possible transmission channels.

4. To understand the direct and indirect channels through which government can reduce the inequality.

5. 5. To calculate the historical contribution of government spending shocks to economic inequality in Pakistan.

1.5 Explanation of the Key Terms

The key terms going to be used in this paper are as follows, along with their explanation.

- Shock: Shocks are exogenous forces that are unrelated to each other and should be economically meaningful (Ramey, 2016).

- Government Spending Shocks: Government spending shocks are sudden changes in government expenditure, usually triggered by economic or natural events. There could be both positive (expansionary) and negative (contractionary) government spending shocks.

- Fiscal Consolidation: These are the measures taken by the government to reduce fiscal deficit and control overall debt, either by reducing government spending or increasing revenues.

- Consumption Inequality: Disparity in levels of spending/consumption between individuals or households within a population.

- Household (HH): A household is a single person or multi person group of people living together making a common provision for food and having nowhere else to live usually.

- Gini Coefficient: This is a measure of inequality, widely used for the calculation of inequality. Gini coefficient provides a single value of inequality, where the value ranges from 0 to 1, 0 indicating perfect equality in the economy and 1, on the other hand, indicates perfect inequality.

- Percentile differences of cross-sectional distribution: This measure of inequality focuses on specific points in distribution, such as the difference between 90th (upper income group) and 10th percentiles (lower income group).

- Cross Sectional Standard Deviation: Another measure of inequality, cross sectional standard deviation measures the dispersion of income around the mean. A higher standard

deviation indicates greater inequality, as it implies a wider spread of values across the population.

1.6 Units of Data Collection:

The units of data collection for this study are households, whose consumption and income patterns are recorded in Household Integrated Economic Surveys (HIES), starting from 1999 to 2019.

HIES data is provided by the Pakistan Bureau of Statistics (PBS) which collects data at the household level. Currently, ten rounds of HIES have been conducted, including data from 1999-2000, 2001-2002, 2004-05, 2005-06, 2007-08, 2010-11, 2011-12, 2013-14, 2015-16, and 2018-19.

The HIES is a nationally representative survey that uses a multi-stage cluster sampling technique with stratification to select households for inclusion in the sample. The number of households included in the survey varies by round where each round covers households between 14000 and 25000.

It is essential to understand the various terms used in the HIES for the accurate interpretation and analysis of the data. Understanding these terms is vital as they provide key insights into household data.

 In HIES, a household is defined as a single person household or multi person household. The multi person household has more than one member living together, providing food through different (or same) income sources, and have nowhere else to live. These people living together may pool their incomes together, and such people could be related or unrelated to each other.

Household members are those persons living together in a house, and have no other place as a usual residence, and these people could be related or unrelated. Those people temporarily absent from the house at the time of surveys, due to several reasons including travelling, hospitalized, or attending educational institutes are considered household members, but the persons living abroad are not considered household members. Their income also falls under remittances or transfers received. Servants or other household helpers, who live in the same house as family members, and have no residence elsewhere are also household members but not the family members.

The household head is defined as the household member, considered the head of household by all the household members living in that house. The household head is often determined based on factors such as age, relationship to the other household members, gender, employment status and decision making abilities. The household head is a key figure in the survey as various characteristics and attributes of the household are often linked to this person.

The employment status of a person in HIES depends on if the household member has worked for at least one hour in the month before the survey was conducted. Similarly, if someone doesn't have formal employment in the form of job, but runs a shop, or business entity or farm during the last year. Also, those household members aged 10 or above who contribute to the household income are considered earners of the house. However, members receiving pension, or rent from the building aren't considered economically active.

The household income includes wages, salaries, and wages in kind, rent from property, receipts or transfers, income from self-employment, all sorts of financial income, and agricultural income. For disaggregate analysis, this study also constructs the income variables including wage income, business income, financial income, and other income.

Household expenditure includes all money used for both consumption and expenditure purposes. HIES includes expenditure for all paid for and unpaid for commodities. These are further classified into commodities that are consumed after the amount being paid, or/and unpaid and consumed. While the former includes commodities bought for consumption, latter includes wages and salaries in kind consumed, own produced and consumed, or receipts from assistance, gifts, and dowry for consumption.

Household consumption expenditure, by definition, is the sum of expenditures made on durables, non-durables, and services. The durables include goods with a life expectancy of 1 or more years. Non-durables on the other hand are goods with less than a year's life expectancy. Expenditure on services is the amount paid for services received in return. Other than that, there is expenditure on the purchase of private vehicles, education, insurance, and housing rent/property tax.

Table 1. Sample Selection

	Dropped Obs.	Remaining HHs
Raw Data		194,800
Incomplete observations	18,105	176,695
Inconsistent data	417	176,278
Zero food expenditure	382	175896
Non-plausible health exp.	5237	170,659
Benchmark sample		170,659

After cleaning and removing any missing values, the dataset contains 170,659 unique households. The missing values for household code, gender of household head and weights are dropped. Similarly, certain restrictions are imposed on certain variables. Observations for food are excluded if the values are missing or zero. In addition, households with up to implausible are dropped. Furthermore, any observations where a household member's age is over 60 and there is no

expenditure on health are also excluded. The benchmark sample of HIES has been compiled after eliminating any irrelevant information. This sample effectively reflects the socio-economic indicators of the population under investigation.

1.7 Significance of Research

Understanding the dynamic impacts of fiscal shocks on consumption and income inequality in Pakistan is essential for evidence-based policymaking. The results of this analysis will provide insights into the prospective effects of fiscal policy changes on the welfare of Pakistan's households. Policymakers can use this information to design fiscal policies that are more equitable and considerate of the most vulnerable population. Policymakers can design effective fiscal policies that are specifically aimed at reducing disparities and promoting inclusive growth. The research can highlight the impact of targeted social spending on reducing income inequality. Alongside, it will also provide insights into the potential distributional effects of fiscal spending.

As per the socioeconomic significance of the study, it is impossible to deny the correlation of consumption and income inequality. Addressing the topics in research can help accelerate poverty alleviation efforts that ensure economic growth. Studies discussing inclusive development can promote governmental opportunities that are specifically designed for poverty alleviation.

The study provides empirical evidence by employing econometric methods and extensive data sets to provide crucial theoretical frameworks for current and future knowledge. The study is bound to validate existing theories and to generate new insights that are specific to Pakistan's economic and fiscal context. As discussed above, the study has significant implications for academia, policy and socio-economic development.

Furthermore, while the literature has studied the analyzing the dynamic effects of spending shocks on macroeconomics, and some of the development indicators like health and education, the study specifically examining the effects of spending shocks on income and consumption inequality is

scant in case of Pakistan. This study, thus offers insights into the distribution effects of spending shocks on inequality, thus filling the gap in the literature.

1.8 Organization of the Study:

The chapter 2 of the study outlines the important literature describing the importance of studying the distributional effects of spending shocks on income and consumption inequality worldwide, along with its significance in the context of Pakistan. Chapter 3 of the study comprises of the methodology used for the research, the data sources and the empirical model going to be employed in the study. Chapter 4, on the other hand, discusses the results of the study, first outlining the evolution of inequality in Pakistan, followed by analyzing the effects of spending shocks on inequality, both at the aggregate and disaggregate level.

CHAPTER II

LITERATURE REVIEW
2.1 Distributional Effects of Government Spending on Inequality

Fiscal policy serves as an important driver for government to achieve the redistributive effects, through different measures including transfer payments and other welfare benefits such as health care and education services. These measures in the form of government intervention ultimately lead to inclusive economic and fiscal growth in the country. In recent years, there has been a notable shift in the focus of literature in terms of fiscal policy and inequality. Instead of solely relying on understanding the causes of inequality, the attention of researchers has now turned to determining the effectiveness of government measures, which are aimed at the redistribution of wealth. This gradual shift reflects the essential role played by government interventions in addressing inequality worldwide. The significance of this transition is also underscored by the effectiveness of economic policy during the global financial crisis and COVID-19, thus highlighting the critical role of government intervention in protecting lower quintiles in the economy.

Given that both the fiscal and monetary sides of the economy can play an integral role in bringing stability in the economy, there has been a rise in the literature, investigating the causes of inequality and ways to reduce this inequality, through both monetary and fiscal measures. There has been considerable research conducted on the issue and the research extensively explores the role of monetary policy in plunging inequality, reflecting a rising interest in understanding the monetary policy shocks on the growing disparities. Analyzing the effectiveness of monetary policy on consumption and income inequality in United States (Coibion, Gorodnichenko, Kueng, & Silvia, 2017) suggest that contractionary monetary policy gave rise to consumption and income inequality

in the country, causing disparities to rise between lower and upper income groups. Authors also explored the different channels by which monetary policy shocks have an effect on the income inequality, finding that effect depends on nature of change in monetary policy. Similarly, using panel data of 32 countries, (Furceri, Loungani, & Zdzienicka, 2018) investigate the unanticipated changes in monetary policy on inequality, suggesting that expansionary monetary policy tend to decrease income inequality, while the constricting monetary policy has an opposite effect.

Due to an overtime increase in inequality, research on the redistributive effects of fiscal policy of the economy has also caught attention worldwide, causing literature on the impact of fiscal shocks to grow rapidly. For instance, (Anderson, Inoue, & Rossi, 2016) highlight that unanticipated fiscal shocks have substantially different effects on individuals, main factors including the age and income levels of individuals. Unlike previous studies that focus on aggregate data, this paper examines the effect on individual consumption by allowing for heterogeneity across households. Expansionary government spending tends to lower the consumption inequality by benefiting poorest individuals, while hurting the wealthiest and working-class individuals. Further contributing to this literature, (Agnello & Sousa, 2014) also emphasize that fiscal measures like spending cuts and increase in taxations lead to widening income gaps in the industrialized economies.

Inequality has gained quite a lot of attention in the developed world, where the focus of research is to reduce, if not eliminate, inequality in the longer run. In the developing countries, however, the evidence on distributional effects of government spending shocks is limited. Using the data from 103 developing countries from 1990 to 2015, (Furceri, Ge, Loungani, & Melina, 2022) constructed unanticipated government spending shocks and studied their effects on distribution of income. They analyzed how unforeseen fiscal expansions lower inequality, while fiscal

consolidations can have long lasting effect on increasing inequality. Thus, it is crucial to examine the fiscal policy measures that effect the inequality in the country.

Similarly, a few studies have been conducted in Pakistan analyzing the impact of fiscal policy on inequality, growth and other notable macroeconomic indicators, including GDP, interest rate, unemployment etc. Using the auto-regressive distributed Lag (ARDL) technique, the authors studied the impact of fiscal policy on inequality, finding out that while development expenditure lowers income inequality, budgetary deficit and urbanization worsen it((Khan & Hashmi, 2015). Another study employs the impact of macroeconomic variables on income inequality, and the findings suggest that economic growth in Pakistan is not inclusive and is positively correlated with income inequality. However, the development expenditure in the form of increased education expenditure positively contributes to reducing inequality, whereas the effect of health expenditure is insignificant.

2.2 Correlation of consumption and income inequality measures

The literature has long focused on the income as a welfare measure, however, now the discourse is extending beyond the scope of income inequality to widely recognized consumption inequality as a welfare measure. The increased focus of policy makers on consumption as a welfare measure has steered the literature towards the merits of consumption inequality. With income data considered to be susceptible of measurement error and under reporting (Meyer, Mok, & Sullivan, 2015), consumption inequality is considered as a preferred measure of consumer well-being. The reason that inequality of consumption is preferred over the income inequality lies in the fact that individuals tend to smooth their consumption over the life time which isn't the case

for income inequality. Similarly, income inequality alone doesn't account for the redistributive policies, which can lower the consumption inequality among the population, through the transfer payments to low income consumers (Hassett & Mathur, 2012). Also, consumption better reflects the over-time living standard of individual and is well reported, compared to the income (Meyer & Sullivan, 2012).

Similarly, against the popular belief that consumption inequality mirrors income inequality, studies suggest that a rise in income inequality has not been accompanied by subsequent rise in consumption inequality (Krueger & Perri, 2006). Another study indicates that consumption and income inequality measures moved in opposite direction in the US after 2006 (Meyer & Sullivan, 2009).

The joint analysis of consumption and income inequality can be advantageous in ways that it can show the presence and nature of income shocks i.e., whether these are temporary or permanent income shocks. Similarly, it can also reveal insights into poorest segments of society by taking consumption and income inequality measures differently (Attanasio & Pistaferr, 2016).

As HIES provides data for both consumption and income, this study aims to estimate both consumption and income inequality measures to capture the welfare of households of Pakistan. This can provide insights into the policy-driven analysis on the well-being of households. Analyzing the shocks affecting the measures of inequality, government intervention in the form of spending can emerge.

In Pakistan, the research on the impact of fiscal spending shocks on macroeconomic variables has been conducted. For example, estimating the Vector Autoregressive model, (Arif & Yasmin Javed, 2009) have analyzed the impact of fiscal spending on macroeconomic variables. While the interest

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rates respond positively to fiscal spending expansions, consumption and output are negatively related to increase in government spending. Similarly, using the SVAR model, (Munir & Riaz, 2020) have examined the effect of policy shocks on macroeconomic variables of Pakistan, showing that increased developmental government spending increases real GDP, while increase in current expenditure leads to increase in prices. The research has touched upon the impact of government spending on education in case of Pakistan, where the increase in government expenditure on education has a positive long term impact on the education quality and GDP of the country((Ali, Hakim, & Abdullah, 2017). Similarly, the spending by government on law and order and education has significantly contributed to the reduction of poverty in Pakistan, whereas the health sector hasn't contributed significantly in the reduction of poverty in the country (Asghar, Hussain, & Rehman, 2012).

While the research on fiscal spending shocks and their impact on overall economy has been conducted in Pakistan, there is a lack of study on the distributional effects of fiscal shocks. This study aims to bridge that gap by estimating the dynamic effects of government spending shocks on consumption and income inequality.

2.3 Identification of Fiscal Spending Shocks:

To understand the relationship between spending shock and inequality, it is important to identify the government spending shocks. There are various methods involved in identifying a shock in the literature.

The most common method used for shock identification is Cholesky Decomposition. In this method ordering of variables and the constraints imposed on contemporaneous coefficients are crucial components, allowing researchers to trace the dynamic responses of the system to shocks in a structured and interpretable way. Another approach for shock identification is the narrative approach. Researchers sometimes use historical events, policy changes, or other exogenous occurrences as natural experiments to identify shocks. This approach involves linking observed changes in economic variables to specific events (Ramey, 2016).

Another method is imposing restrictions over the long horizon. This method focuses on capturing the enduring relationships among variables. This approach can be particularly useful when the researcher has insights into the economic structure over the long term, allowing for the identification of structural shocks that have a persistent impact on the system. This method was used by (Galí, 1999) to evaluate the effect of a technological shock on economic variables, where he assumed that only technological innovation in form of shock can affect the productivity of labor in the longer run. Another method is forecast errors, which refer to the differences between predicted values and actual outcomes. This study also utilizes the forecast errors method for shock identification of spending. This approach offers certain advantages in identifying shocks compared to traditional approaches. The forecast error approach bypasses the challenge of zero observations, present in narrative approach, by focusing on the deviations from forecasted government spending (Auerbach & Gorodnichenko, 2013). Similarly, it also deals with the issue of fiscal foresight, by

aligning the available information. By addressing these challenges, this method provides a more reliable basis for shock identification.

2.4 Theoretical Framework:

While exploring the effects of fiscal spending shocks on the consumption and income inequality, the theoretical framework relies on the heterogeneous agent model, an economic model that explains how individuals respond differently in their consumption patterns to a policy shock. This model is opposite to the homogenous model of economics, which assumes that all economic agents are the same and act in the same way in response to policy shocks. The different frameworks in the heterogeneous agent model explain the interaction between consumer behavior and government spending. One of the prominent framework is Real Business Cycle (RBC), according to which, individuals tend to decrease their consumption, after there is an increased government spending shock. The anticipation of the rise in future taxes by individuals, because the current government expenditure is financed either by debt or could be a reason of fiscal deficit, cause the individuals to reduce their current consumption and hold that money as savings. The lifecycle hypothesis suggest that individuals base their consumption decisions on lifetime income and thus tend to save during the period of high income and lower their consumption. This is considered a negative wealth effect because even after the rise in real income, the individuals tend to lower their consumption. The individual behavior also depends on the income level of households, where the households with high income have a low marginal propensity to consume (MPC), and those with low income have higher MPC. Thus lower income households tend to increase their current consumption when their disposable income increases, unlike higher income households, who tend to save the money.

On the other hand, the Non-Ricardian Model assumes that individuals don't fully internalize the future increase in taxes associated with debt liabilities thus leading to an increase in the current consumption. Consumers, thus don't adjust their consumption behaviors based on future expectations, and a positive government spending shock can lead to increased current consumption by households. The crowding out effect, which is strong in the RBC model, and which suggests that with increase in government spending (usually financed by borrowing) crowds out the private sector and lowers the aggregate demand, is not effective in the non-Ricardian model, and the aggregate demand is higher with increase in spending by government.

The difference in behavioral response of consumers to the government spending shocks can be explained by heterogeneous agents' theory, studied in literature (Galí, et al., 2007, Anderson, et al., 2016, Ma, 2019). In the RBC model, there are infinitely lived households, that make consumption decisions based on the intertemporal budget constraint. Thus, there is a negative wealth effect and a lowering of the current value of after-tax income due to an increase in government spending. However, the rule of thumb consumers react differently to government spending according to the Non-Ricardian theory. In this model, credit-constrained consumers react positively to increased government spending, while rich individuals respond negatively (Anderson, Inoue, & Rossi, 2016). Using these theoretical models, this study develops an empirical model to understand the behavioral response of individuals.

The literature review delves into four major themes. Firstly, it discusses the increased attention of researchers towards understanding the government interventions to mitigate the disparities in income and consumption, from the monetary or fiscal side of the economy. Secondly, the usage of both income and consumption variables are important to measure inequality to avoid any underreporting in the disparities, and to emphasize on different ways consumption and income

measures can change the outlook of the inequality. Furthermore, it is essential to analyze whether the inequality is arising from the consumption or income, or both. Thirdly, along with estimating the inequality, the different methods of shock identification are also discussed, highlighting the strengths and weaknesses of each method, and, the measure going to be used in this study has what advantages over the other methods. Lastly, theories including Real Business Cycle and the Non-Ricardian Model support or oppose the argument of decline in inequality due to surge in fiscal spending. While the wide range of research, using different methods of shock identification and estimating the effects of these shocks on inequality, has been conducted worldwide, this study plans to estimate the same effect in case of Pakistan, to fill the gap in literature and open the pathways for future research to explore the different scope of the study.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Data Sources

The quarterly data from Household Integrated Economic Survey (HIES) is utilized in this study, to calculate the consumption and income variables for further analysis. The quarterly analysis is valuable to study because it will allow us to observe the seasonal variations in the data set, which can not only help us understand the varying consumption and income inequality, but can also be useful in grasping the varying consumption patterns in a country like Pakistan, where the consumption can fluctuate in different seasons based on agricultural activities and religious festivals etc. The study site encompasses urban and rural areas across all provinces and regions of Pakistan, giving a comprehensive picture of consumption and income patterns from across the country.

The HIES data is a cross-sectional dataset, collected by the Pakistan Bureau of Statistics in alternate years, if not annually, thus capturing thorough socio-economic information from a diverse sample of households. The dataset spans multiple survey rounds, starting from 1999 to 2019, allowing for a comprehensive analysis of fiscal policy dynamics, consumption patterns, and income inequality across different regions and socio-economic groups in Pakistan. Including data on household consumption, expenditure, income from different sources, assets ownership (both agricultural and non-agricultural), demographics, and other relevant variables, this data is the most reliable data which is officially available for this study. HIES is a nationally representative survey that uses a multi-stage cluster sampling technique with stratification to select households for inclusion in the sample, according to Pakistan Bureau of Statistics (2020). The number of

households included in the survey varies by round where each round covers households between 14000 and 25000. The quarterly data from 1999 to 2019 is used for the disaggregate analysis. For identification purposes, a unique household ID is assigned to each household within the dataset.

The primary variables of interest, for this study, from HIES data include expenditure and earnings derived from diverse sources. Subsequently, these variables undergo adjustment through the Consumer Price Index (CPI). Quarterly data for CPI is sourced from International Financial Statistics (IFS) from the time period 1999 to 2019. IFS provides reliable and robust data for CPI, which is essential for analyzing inflation and cost of living changes over time. The base year for the CPI data is 2010, meaning that the index is normalized to 100 for that year, and all other year's index values are calculated in comparison to this year. This allows us for a consistent comparison for price changes over time, with prices in 2010 as a reference point. To ensure the CPI data accurately reflects the consumption patterns of households in Pakistan, the weights for certain categories of goods and services are derived from HIES data. These weights were applied to CPI, ensuring that this integration reflect the relative importance of goods and services according to spending patterns of households of the country.

Consumption of the households includes consumption of durables, non-durables, and services, whereas the income is divided into business income, financial income, wages income, and other income which includes transfer payments and pension, etc.

Consumption expenditure includes the consumption of durables, non-durables and services. The durables are items that are expected to have a long lifespan, such as household appliances, furniture, vehicles, and other capital goods. Non-durable goods are items that are consumed or used up in a short period, such as food, clothing, and personal care products. The services category encompasses various services that households consume, such as housing, utilities, healthcare,

transportation, and recreation. Household consumption, thus, is the sum of durables, non-durables, and services, while total expenditure includes consumption and expenditure on vehicles, education, insurance payment, and housing rent and housing property tax.

The household income includes wages, salaries, and wages in kind, rent from property, receipts or transfers, income from self-employment, all sorts of financial income and agricultural income.

Dependent variables:

- Consumption Inequality Indices: Gini coefficient, percentile differences of cross-sectional distribution, and cross-sectional standard deviation.

- Income Inequality Indices: Gini coefficient, percentile differences of cross-sectional distribution, and cross-sectional standard deviation.

Independent Variables:

- Government Spending Shocks: Quarterly Government Expenditure data from Finance

Division of Pakistan

- Household Characteristics: age of household head, gender of household head, highest education of household head, number of households

3.2 Empirical Model

The empirical method going to be used for this study is Local Projection method, which was developed by Jordà (2005). This method will allow for flexible, and data driven analysis of effect of spending shocks on consumption and income inequality in Pakistan.

The Local Projections (LP) method is used to compute impulse response functions. However, impulse response functions created by LP are different from Vector Autoregressive (VAR) model's response function because former could be computed without specifying and estimating a multivariate dynamic system. Also, LP involves estimating the response of each variable to a shock at a specific point in time, without making assumptions about the underlying structure of the entire system. This is different than VAR model, which often involves extrapolating impulse responses into distant horizons. Thus, both LP and VAR model may produce same impulse response functions in the short run, but VAR produces different IRF at intermediate and long time periods (Li, Plagborg-Møller, & Wolf, 2024).

Local Projections Method is preferred over VAR and SVAR, because of certain reasons. Firstly, LP estimators exhibit a lower bias than VAR estimators, and are more reliable (Li, Plagborg-Møller, & Wolf, 2024). Secondly, LP estimators can be estimated using straightforward regression techniques (Jordà, 2023). The LP method also requires fewer restrictions to produce Impulse Response functions and estimators of LP exhibit increased robustness. This method can also accommodate nonlinearities in the response function (Auerbach & Gorodnichenko, 2012).

While LP method is preferred over VAR in this study for its advantages, there are few limitations of the method as well. The method is less efficient when it comes to small samples compared to VAR, because VAR model estimates the entire sample simultaneously, thus improving precision even in the smaller samples. LP is also observed to have significantly increased variance, particularly at intermediate and long horizons (Li, Plagborg-Møller, & Wolf, 2024).

The equation going to be used to estimate causal effect of government spending shocks on inequality is following.

$$y_{t+h} - y_{t+h-1} = c^{(h)} + \sum_{j=1}^{j} \alpha_j^h (x_{t-j} - x_{t-j-1}) + \sum_{i=0}^{I} B_i^{(h)} e_{t-i}^g + \varepsilon_{t+h} = 0,$$

$$h = 1, 2, 3, \ldots, H. \qquad \text{Eq (3.1)}$$

In above equation, y_t is the inequality measures that are primary variables of interest, including Gini Coefficient, Standard deviation, 90th and 10th percentile difference, h is the forecast horizon, and e_t^g are the quarterly government spending shocks. Equation 1 generates the accumulated response functions from the estimated $\{\hat{\beta}_0^H\}_{h=0}^H$. This study also presents p-values indicating whether the null hypothesis, which states that government spending shocks have no impact on the different inequality measures across entire range of horizons $h=0\ldots H$, is rejected or not.

CHAPTER IV

RESULTS AND DISCUSSION

4.1 Analyzing the Evolution of Inequality in Pakistan

This section underscores the evolution of consumption and income inequality in Pakistan for the past 20 years. It also characterizes the evolution of income inequality at the disaggregate level, taking in account wages, financial, business, and other income inequality, and consumption inequality in durables verses non-durable goods. Furthermore, the inequality in interest-sensitive and non-interest-sensitive expenditures is also highlighted, to capture the comprehensive picture of consumption inequality.

Figure 1 illustrates the measures of consumption and income inequality for total income, total expenditure financial income, and consumption. These measures are calculated by Cross Sectional Standard Deviation, Gini coefficient and difference of 90th-10th Percentiles, shown in Panel A, Panel B and Panel C, respectively.
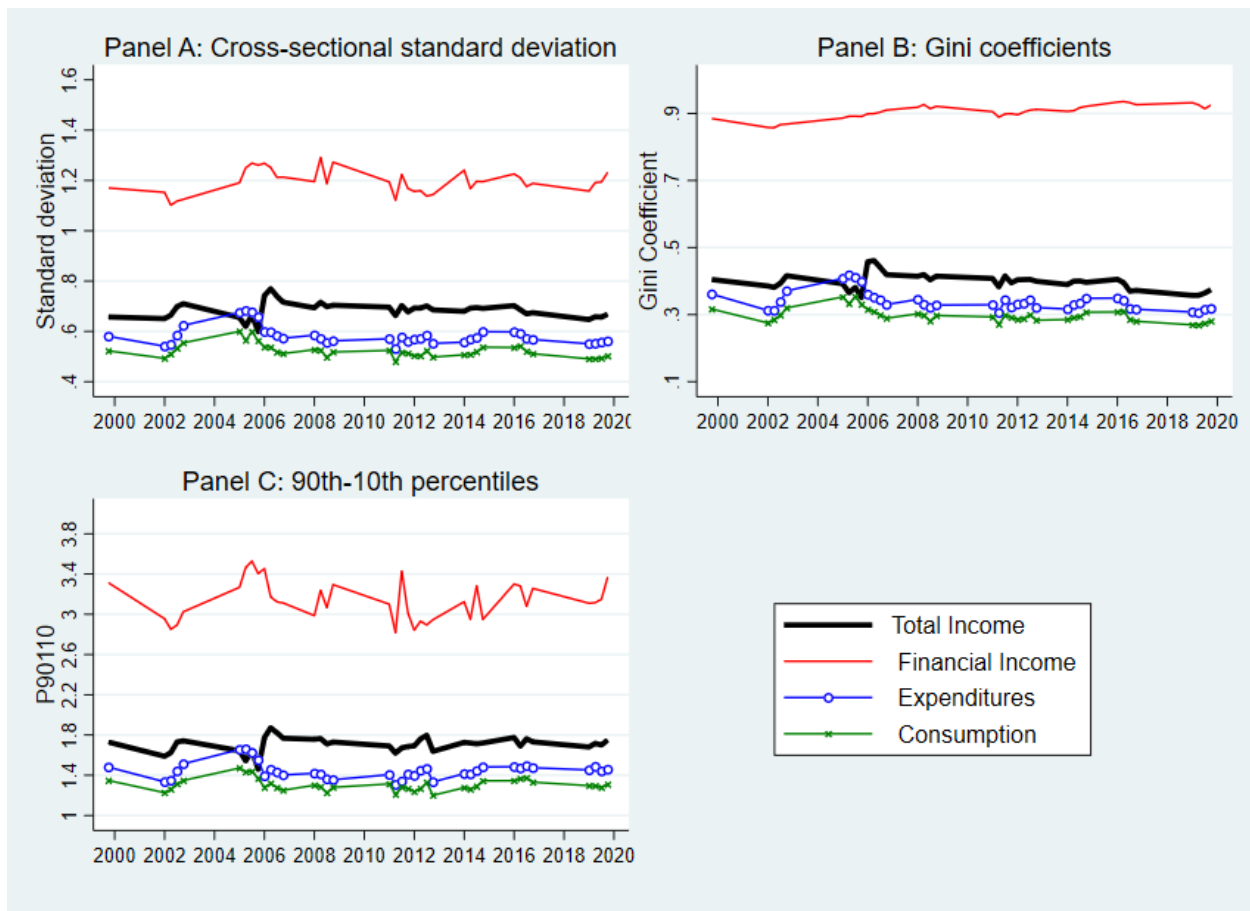
Figure 1. **Income, expenditure, financial, and consumption inequality in Pakistan 1999-2019**

The figure above demonstrates that while inequality in financial income (constituting savings, jewelry sold, dividends, insurance and loans) has fluctuated throughout the time period for both Cross Sectional Standard Deviation and 90th-10th Percentile measures of inequality, it has shown a relatively stable trend for the Gini Coefficient. Furthermore, financial income inequality is quite higher in magnitude for all the three measures of inequality, and shows an upward trend, indicating that financial inequality has increased over the years. The increase in financial disparities can be attributed to lower financial inclusion of rural region and the lower income groups, making the lack of access to finance and capital a barrier in narrowing this gap of financial inequality (Zulfiqar, Chaudhary, & Aslam, 2016). Similarly, the rise in interest rate

during this time period is also accompanied with the rising financial inequality. Income inequality, on the other hand, declines with slight fluctuations till 2006, the results consistent with the existing research (Hamid & Akram, 2014), after which it exhibits a sudden spike and then it tends to smooth down until 2020 with minor upward movements. Expenditure and consumption inequality move in a similar pattern, increasing till 2006 and then remaining relatively stable with minor fluctuations till 2020. This movement of consumption and expenditure disparity can be explained in terms that consumption of middle class grew from 32% to 55% between 2002 and 2011 in Pakistan, raising the real aggregate demand and stabilizing the consumption gap (Ghani, 2014). Moreover, the analogous movement of consumption and income inequality, validates the popular belief that consumption inequality mirrors income inequality (Aguiar & Bils, 2015), albeit consumption inequality being lower in magnitude than income inequality.

It is crucial to understand and characterize the different measures of inequality at the disaggregated level, as each component of the consumption and income exhibits distinct behavior.
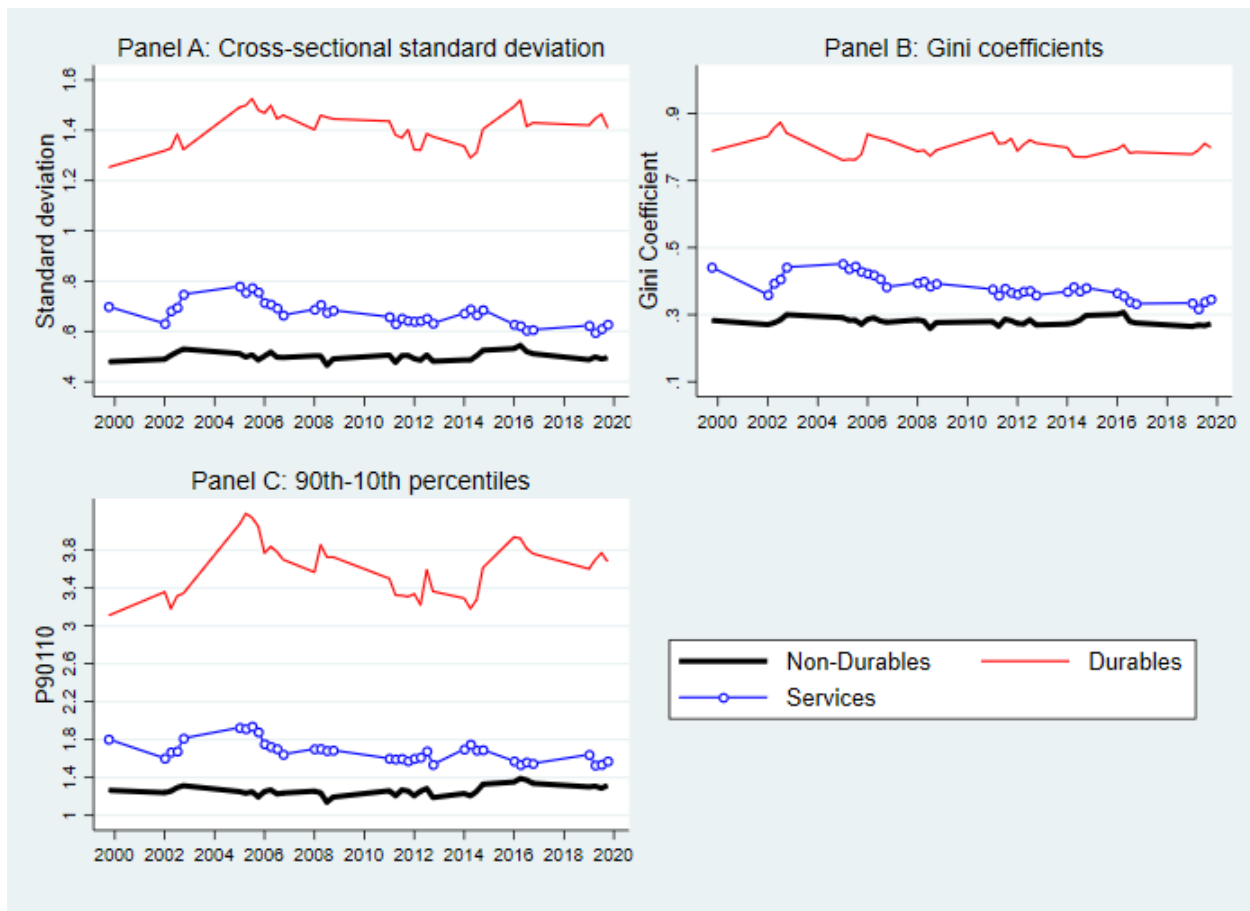
Figure 2. **Inequality in Durables, Non-durables and Services**

Figure 2 portrays the inequality in each component of consumption (durables, non-durables and services) and how these differ in each inequality measures. Consistent with results by Idrees and Ahmad (2010) the graph depicts that durable goods (or non-food consumption) have inconsistence movements of all, and thus consumption inequality of durables goods, for all three measures of inequality, is higher than the non-durables and services. This could be explained in terms that durable goods constitute goods that are usually interest sensitive, i.e., vehicles, housing and education etc., which affect lower income group more than the upper income group, because now lower interest rates allow them to buy durable goods which were expensive earlier. Thus, when interest rate declines, the poor tend to increase their consumption of durable goods,

while the rich, being largely unaffected by the decline in interest rate, have similar consumption of durable goods, causing the inequality of durable goods to decrease. Also, it is important to note that inflation rate significantly impact the increase in prices of commodities, making them inaccessible for the poor. The expensive education, the consistent increase in fuel prices and the unaffordable household items, being considered luxurious, rise the disparity in consumption between rich and poor, where former doesn't get affected by the change in prices, while latter either reducing or altogether discontinuing the consumption of these goods. The consumption inequality of durable goods increase till 2006, a trend consistent with the total consumption shown in Figure 1, and then declines briefly, but overall showing quite fluctuations in its trend from 2008 to 2020.

The inequality in services goods exhibit a similar pattern to non-durable goods, but with a lower magnitude, thus increasing till 2006, and then showing a consistently declining trend until 2020, with a slight increase from 2012 to 2014. This shows that access to basic services is usually available for both rich and poor, with rich having advantage on a few services, which are not affordable for poor. Those services could either be in form of health, personal beauty services, and/or the services in the education etc. Inequality in non-durables, however, doesn't show any erratic behavior exhibiting minor fluctuations, thus being considered stable throughout the time period. Non-durables goods are necessities and their prices affect both upper and lower income distribution groups equally. Although the graph of durables good is relatively stable, it does increase from 2014 onwards, indicating the slight rise in inequality. This inequality can be originated from the increase in indirect taxes on the essential items, making them expensive for poor (Idrees & Ahmad, 2010). However, the increase in this inequality is not significant, unlike the other two components of consumption.

The disaggregate analysis for interest and non-interest sensitive expenditures is important to analyze the whole picture of consumption and expenditure inequality. This is because of the fact that consumption of durable goods constitutes only of general household expenditures, excluding the major household expenses like housing rent, education and vehicles etc. The interest sensitive expenditures, thus include larger household expenses components like household appliances, expense on education, housing rent and taxes, and vehicles. The rest of the household expenses are the part of non- interest sensitive expenditures. It is vital to understand how consumption of interest sensitive and non-interest sensitive goods can affect the top and bottom percentiles differently.
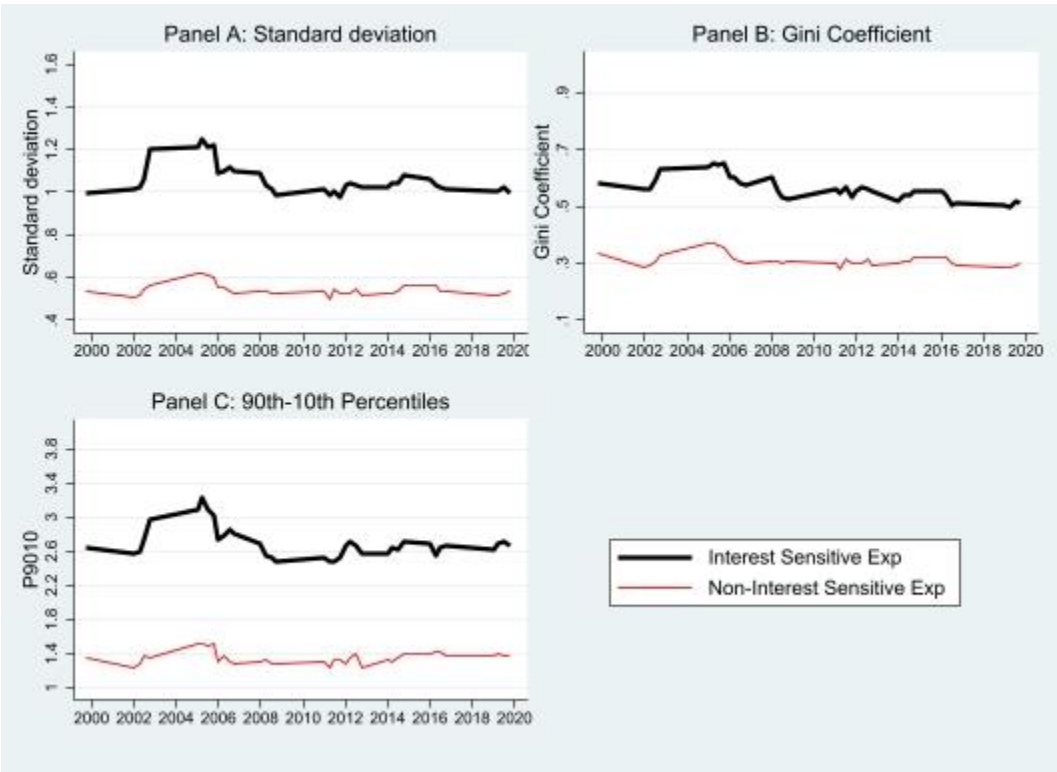

Figure 3 **Inequality in interest and non-Interest sensitive expenditures**

Figure 3 shows disaggregate analysis of interest and non-interest sensitive expenditures for all metrics of inequality. Interest sensitive expenditure tend to rise till 2005 and then there is a sharp decline, with the trend continuing till 2020, with slight fluctuations, for both cross-sectional standard deviation and 90th-10th percentiles. For the Gini coefficient, however, the interest-sensitive expenditures don't exhibit a sharp increasing or declining behavior. Non-interest expenditures, on the other hand, show a relatively stable trend throughout the period for all metrics of inequality, supporting the concept that non-interest-sensitive goods are equally demanded by the rich and the poor, and their consumption cannot be compromised.

Similarly, like the disaggregate analysis of consumption and interest-sensitive expenditures, it is essential to analyze income at the disaggregate level. The following figure shows the inequality in financial, business, wages, and other income for all three measures of inequality.
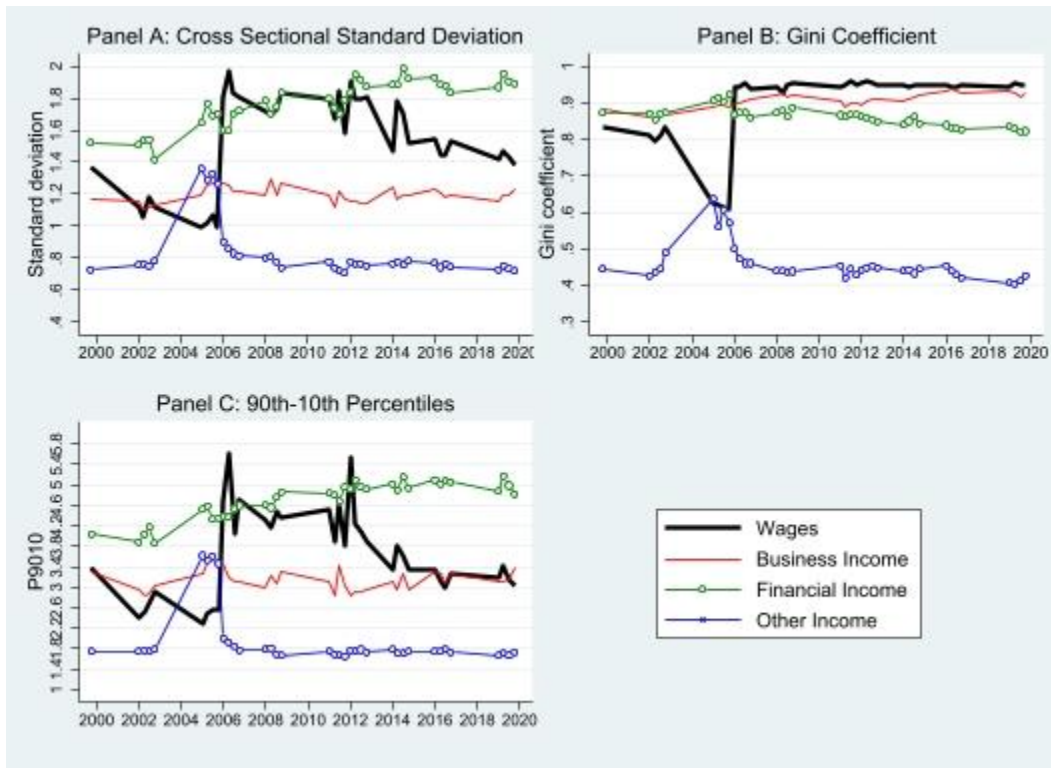

Figure 4. **Inequality in all components of income**

Income components show quite peculiar behavior in their movements. Business income (property rent, property value, share, rent, and selling value of agricultural property and livestock sold), for instance, depicts a decline till 2005 for Cross-sectional standard deviation and 90th-10th percentiles, after which it rises suddenly with a sharp spike, and then shows a falling trend till 2012, after which it increases again, only to decline again till 2020. Gini, for the business income, on the other hand, tends to decline till 2005, after which it increases with a sharp spike and then shows a relatively stable movement throughout the remaining period. The other peculiar movement is shown by wages (salary, wages, wages in kind, income from other occupations), which rose till 2005 for all the three metrics of inequality and then suddenly declined, only to smooth down until 2020. The mechanization of industrial and agricultural sectors after the 1990s led to a low demand for labor, where the surplus supply of labor caused the wage rates to decline in Pakistan. Similarly, the demand for high-skilled labor increased, pushing the already poor and unskilled labor to further down the poverty line, and causing a surge in wage disparity (Asad & Ahmad, 2011). The sharp hike followed by a decline in other income (pension and transfers received) from 2003 to 2006, can be explained by the reduction of social safety net expenditure during that period (Asghar, Hussain, & Rehman, 2012), leading to a widening inequality gap. Although financial income exhibits a stable pattern and doesn't exhibit any sharp increase or decline throughout the whole period, the high financial inequality could be explained in terms of lack of access to credit and high interest for the poor, excluding them from the financial development of the country.

4.2 Effect of Government Spending Shocks to Inequality

This section presents the effects of government spending shocks on consumption and income inequality in Pakistan. This is done by estimating the impulse response function of inequality at both aggregate and disaggregate levels. Using Jorda's Local Projection model, the impulse response functions are generated for all three measures of inequality. The first part of this section outlines the identification method of government spending shock, followed by the effects of these shocks on all measures of inequality. Finally, the discussion on the robustness check of results concludes the section.

4.2.1 Shock Identification:

The study first identifies government spending shocks using the deviation from the longrun trend, which is the difference between actual spending and forecasted growth.

$$G_t^{shock} = G_t - \overline{G}$$

Following (Zakir & Malik, 2013) these shocks are generated through the Vector Autoregressive (VAR) model, using the equation given below.

$$Y_t = c + \sum_{m=1}^{m} b_{11} Y_{t-m} \sum_{m=1}^{m} b_{12} Tax_{t-m} + \sum_{m=1}^{m} b_{13} GDP_{t-m} + \sum_{m=1}^{m} b_{14} interest_{t-m} + u_t$$

(Eq. 5.1)

In the above equation, the Y_t is the total government spending, and development spending alternatively. The m is number of lags used in the VAR model, which are 2 lags for the total spending shock, and 4 for the government spending shock. The lag length criteria is chosen by the Akaike Information Criterion (AIC) and Shwartz Information Criterion (SIC). All the variables used in the above equation are stationary, and model doesn't exhibit any

autocorrelation. The u_t is the total expenditure and development expenditure shock generated alternatively through using the relevant Y_t.

The shocks generated through VAR are shown below.

Figure 5 illustrates the generated total government spending shocks, with sudden increase and decreased in government spending between time period 2000 and 2005. Similarly, the spending fluctuates around the mean line till 2020.
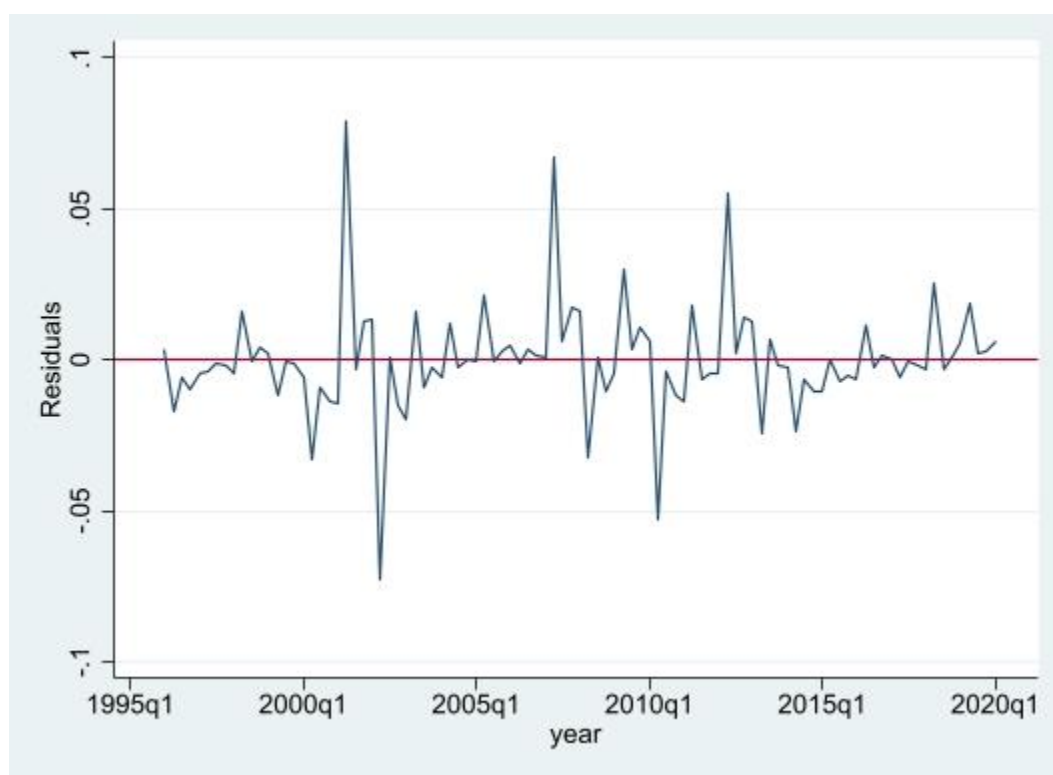

Figure 5. **Total Government Expenditure shock**

The study doesn't solely rely on government expenditure shock, but also takes in account for government development expenditure to identify whether the results are robust and doesn't show any sharp fluctuations when a different measure is used for the estimation of results. Following figure shows the fluctuations in government development expenditure shocks.
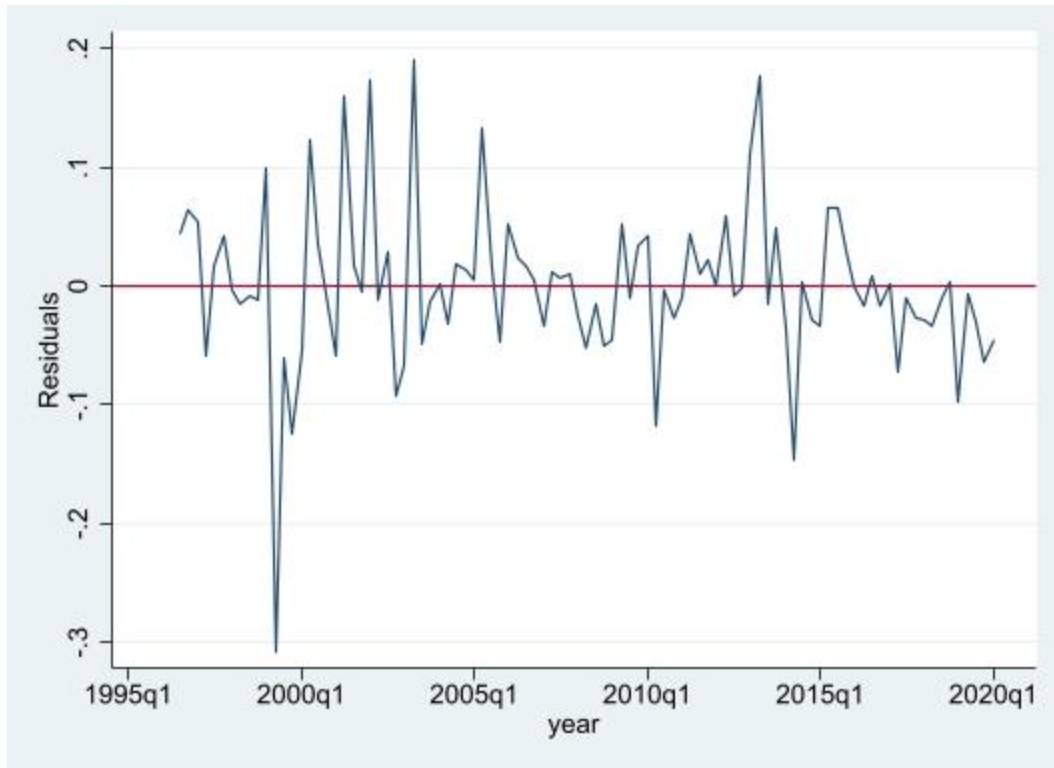
Figure 6. **Development Expenditure Shock**

The development expenditure shock exhibits a sharp decline around 1999, after which it shows

fluctuation around the mean. These shocks are used further to analyze the effect of spending on

consumption and income inequality in Pakistan.

4.2.2 Effect of Government Spending shocks to inequality:

The following figure shows the impulse response function for all three measures of inequality at the aggregate level, using data from 1999Q4 to 2019Q4 at the 90% confidence interval, as estimated by equation 3.1. The different forms of inequality, including expenditure, income, consumption inequality, etc. are presented column-wise, while all three measures of inequality are presented row-wise.

Figure 7 shows that the standard deviation and Gini coefficient initially decline, for consumption, at the first horizon when the spending shock is introduced, followed by a sharp increase, with further decline from the 6th horizon onwards, and showing fluctuations in between. This shows that consumption inequality demonstrates a significant decline after the fiscal expansion for all measures of inequality, except the difference between the 90th and 10th percentile, which doesn't show any significant decline in consumption inequality. Expenditure inequality shows a similar response to consumption inequality after an expansionary spending shock, where it initially declines, increases for a brief period, and then stabilizes to zero, indicating no significant decline in expenditure inequality in response to spending shock.

The standard deviation and Gini coefficient for total income briefly increase after the spending shock, indicating that the initial response to government spending shock on total income is positive. The effect is significant, and then the income inequality shows a sharp decline in the 3rd horizon, followed by sudden increasing and decreasing movements between the 5th and 7th horizons, after which it stabilizes, indicating an insignificant decline in inequality after the spending shock. Similarly, for the difference between the 90th and 10th percentiles, the initial response is negative which then fluctuates around zero, throughout the period, indicating no significant impact of spending shock on inequality.

For financial income, the response of spending on all measures of inequality briefly increases initially, except for the Gini coefficient, which indicates a delayed response. For all three measures, financial inequality varies around zero, indicating stabilization in the financial inequality but it tends to fluctuates in the short term, as it could be seen from the sharp dips and sudden rise in the graph. This could be explained in terms that the upper percentile usually has easy access to credit, disproportionately allowing them to benefit from government interventions like quantitative easing, which lowers the interest rate and increases the money supply, or/and boosting the asset prices which could be beneficial for rich holding more assets than poor. The poor, generally have lower access to credit markets and they face financial constraints in the country, denying them financial inclusion and thus widening the gap.
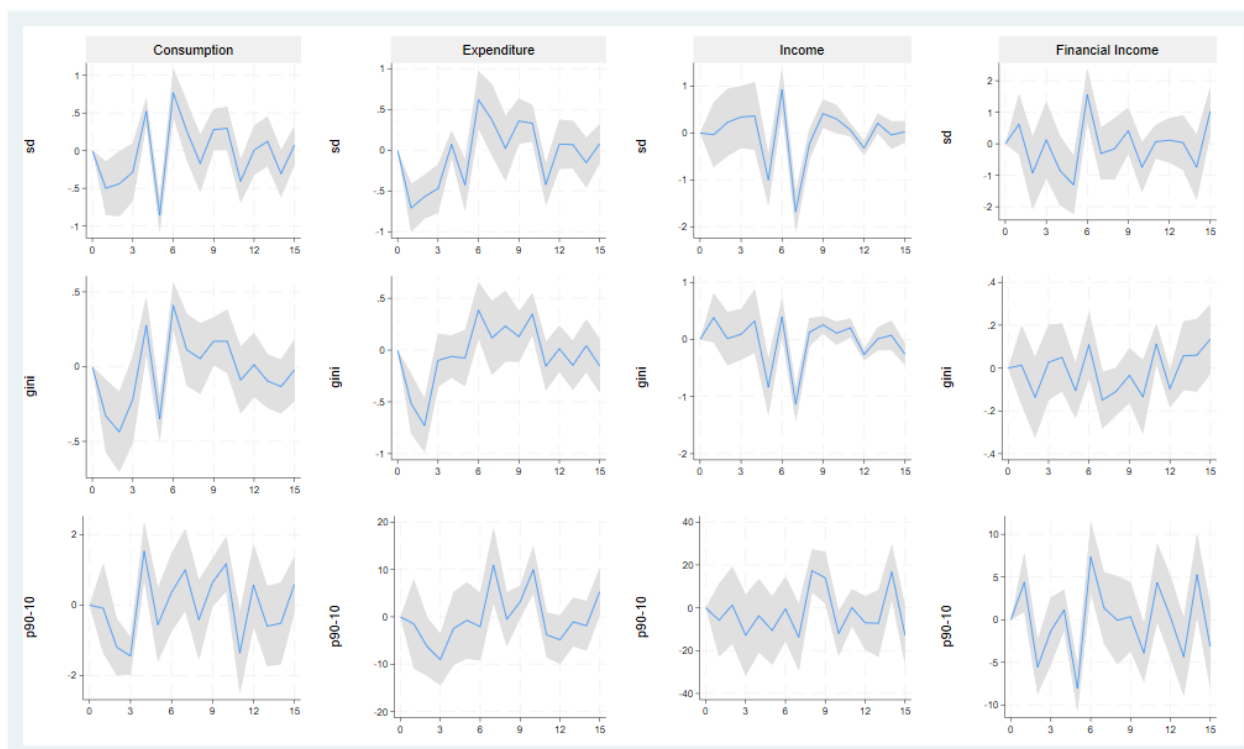
Figure 7. Response of inequality to expansionary government spending shock

Note: The figure illustrates the impact of spending shocks on overall inequality using a 90% confidence interval. The time is in quarters, presented on the horizontal axis, and the measures of inequality are on the y-axis. The blue lines show the impulse responses, whereas the grey shaded area shows the 90% confidence interval, for overall inequality, including consumption, expenditure, total income, and financial income shown in the first, second, third, and fourth columns respectively. Similarly, three different measures of inequality are presented in rows, where the cross-sectional standard deviation is in the first row, the Gini coefficient in the second row, and the difference between the 90th and 10th percentile in the third row.

The effect of spending shocks on disaggregated measures of inequality in income components is also analyzed, to assess which component of income is facing more inequality. It is important to analyze the source of inequality to figure out from where the inequality is arising. This information can be helpful for the policy making to figure out which part of the inequality can be targeted first to alleviate poverty and can be useful in reduction of inequality in the country. Figure 8 shows that both standard deviation and the difference between the 90th and 10th percentiles experience a sudden decline in the first 3 horizons for wages, followed by a sharp

increase around the 5th horizon, but then stabilizes around zero, indicating an insignificant impact of spending on wages. This reduction in inequality in wages can be explained in terms that, increase in fiscal expenditure, either in the form of infrastructure or health and education expenditure, raises the wages of lower income groups, thus narrowing the gap between the rich and the poor. The Gini coefficient, on the other hand, shows a fluctuating behavior, which is also insignificant, implying that fiscal spending has a trivial impact on wages. Similarly, the salary income is a component of wages, and the rise of salary for public sector employees, and the subsequent rise in minimum wages could be a possible explanation for the stabilization of wage inequality.

For the business income, both Gini coefficient and standard deviation show an insignificant response, however, the 90th-10th percentile shows a decline in inequality, followed by a sharp rise, indicating that the gap between poor and rich widens for the business income.

 Financial income shows some significant fluctuations for all three measures of inequality, which could be again aligned with the financial income inequality, where due to lack of access to credit and financial constraints, the lower percentile experienced a significant pushback limiting their economic opportunities. Other income, which includes income from pension and transfers received, also shows a decrease in inequality in response to spending shock, but only with standard deviation showing a significant increase. This is consistent with the World Bank's findings (2024) explaining that targeted transfers in Pakistan are small and have no substantial outcome in reducing inequality in Pakistan.
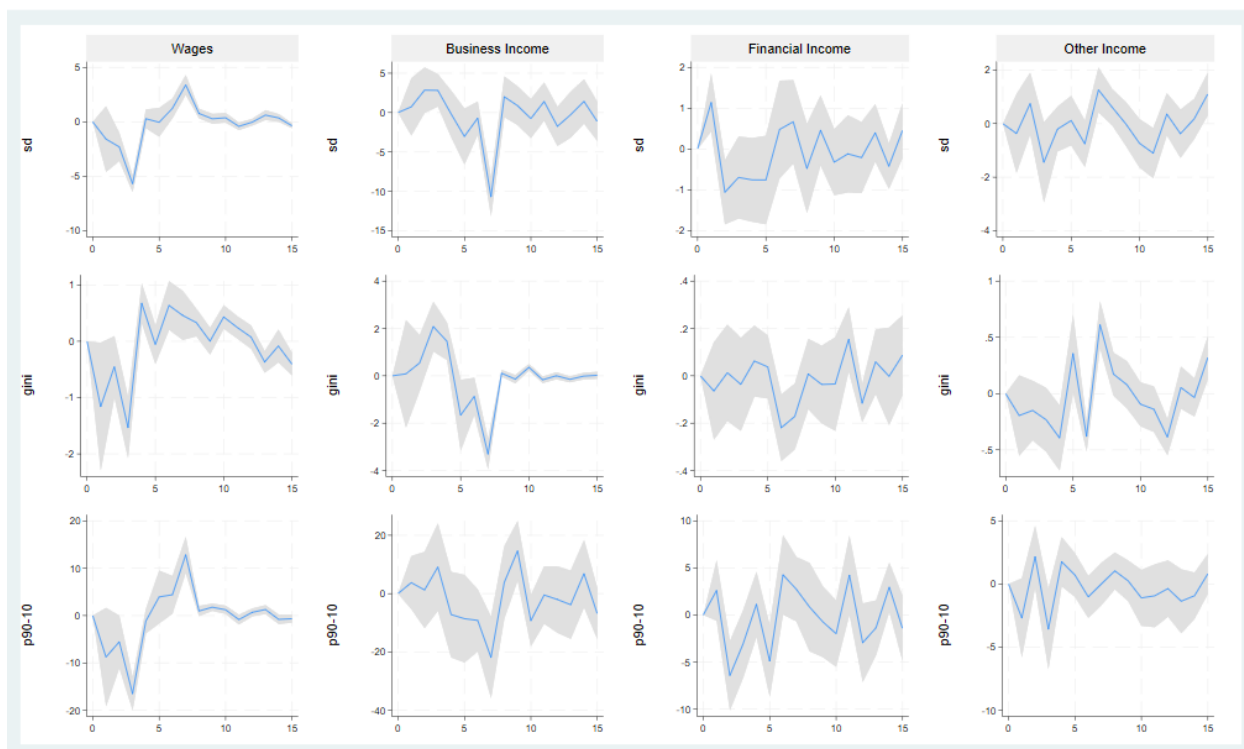
Figure 8. **Disaggregated response of spending shock on inequality**

The study also broadens the analysis to evaluate the effect of government shock impulse response functions for interest sensitive and non interest sensitive expenditures. For interest sensitive expenditures, all three measures of inequality, show an initial decline in response to government spending shock. This result shows that with an expansionary spending shock, the inequality of interest sensitive goods, which are durables, declines. The literature shows that expansionary fiscal policy is often accompanied with a rise in interest rate, thus affecting the upper and lower quintiles differently, where upper quintiles significantly reduce their consumption due to increase in interest rate, leading to reduction in inequality. The inequality, however, rose during the third horizon, and then again declines for all three measures except for standard deviation, which stabilizes around the zero. Only Gini coefficient is significant for the interest sensitive expenditures, confirming that inequality declines for interest sensitive

expenditures in response to spending shocks. The inequality in non-interest sensitive expenditures shows a fluctuating behavior, indicating that consumption inequality of non-interest sensitive expenditures is insignificant due to a spending shock.
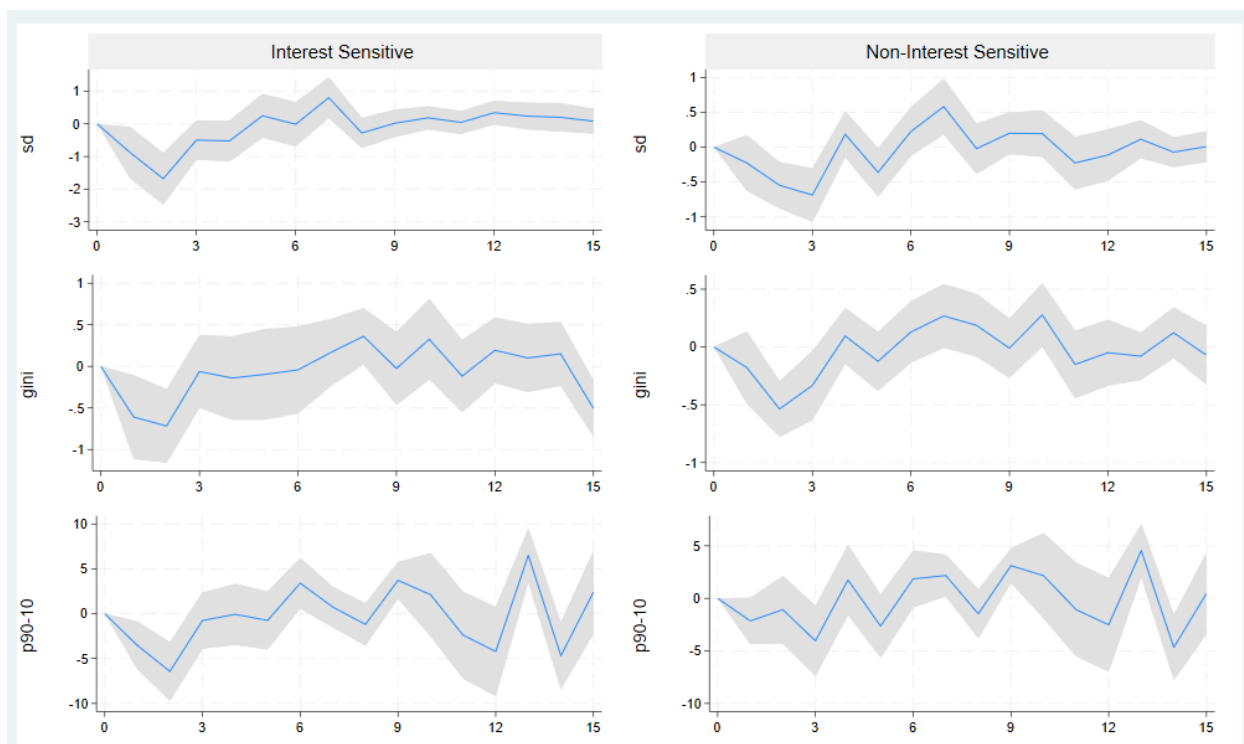

Figure 9. **Response of Inequality to interest sensitive and non-interest sensitive expenditures**

4.3 Robustness Analysis:

The study considers a robustness check for the sensitivity analysis of the benchmark results, to confirm that results are not sensitive to the particular method used in the study. Using the development spending shock, instead of the total government spending shock, the study performs additional analysis to check the reliability of the results. The results of the shock of development expenditure (shown in figures 10, 11, and 12 in the appendix) indicate that the benchmark results of this study are consistent and don't show any peculiar behavior and are mostly unaffected.

4.4 Qualitative Analysis:

The section contextualizes the distributive effects of government spending on inequality in Pakistan, thus analyzing the qualitative side of the research. This is done through evaluating the interviews conducted from government officers in Ministry of Planning Commission, Pakistan, and from the renowned economist from University of Bristol, United Kingdom. The section first outlines the importance of government spending shocks on inequality and the methods through which spending can affect inequality, evaluating the way government spending is financed, followed by the disaggregated analysis of possible consumption and income inequality response to spending shocks, and finally assessing the contribution of research on policy analysis in Pakistan.

It is important to investigate that whether fiscal policy in form of government spending can enhance equity and be effective in reducing inequality, because government spending, with strongest effect from social welfare and spending on health and education, has proven to reduce disparities (Anderson, D'Orey, Duvendack, & Esposito, 2017).

Along with analyzing the distributional effects of government spending, it is vital to look at the channels through which it does effect inequality. There are channels which can narrow the gap between rich and poor through government intervention. These channels are spending on education, health and infrastructure, transfers and subsidies, the indirect channels are the way the spending is financed.

There are few important tools by which government can directly reduce consumption and income inequality in Pakistan. The first channel is government expenditure on health and education. These being the necessities, can help improve the economic and social condition of a

country. The research indicates that government spending on education has a substantial impact on reducing inequality in Pakistan (Ali, Hakim, & Abdullah, 2017).

The next important channel is spending on infrastructure. Investment on physical and financial infrastructure is vital for the inclusive growth and development, so that no growth is being made at the expense of poor. While the financial infrastructure makes the access to credit easy for everyone, the physical infrastructure extends the employment opportunities. The spending on financial and physical infrastructure has proven to lessen the inequality in Pakistan (Batool, Haroon, & Sohail, 2022). The composition of public spending also matters, when it comes to spend on development projects. Research shows that there needs to be an optimal balance between development and recurrent budget for the better allocation of resources and how these resources are utilized to alleviate inequality in Pakistan (Farooq, 2016).

Fiscal Policy incidence is another important channel to reduce inequality. Designing government policies in such a way that income after taxes should not significantly impact the welfare of people, can be useful in reduction of inequality. Thus using direct taxes and transfers to poor, governments can intervene in narrowing the disparities (Lustig, 2016). Research in Pakistan also suggests the similar results, where the role of direct taxes in reducing the inequality is proven, while the opposite is true for indirect taxes and fiscal deficit, where debt is usually financed by indirect taxes (Khan & Padda, 2021). However, given that major portion of taxes in Pakistan comprise of indirect taxes, the regressive taxation system, narrow tax base and inefficient tax administration plays a significant role in increasing disparities (Zulfiqar, 2018).

The next channel through which government can reduce inequality is through transfers and subsidies. By providing targeted subsidies to relatively poor households and assisting them through cash transfers, government can directly affect the household consumption and lowering

the disparities in country. One such example of cash transfers is Benazir Income Support Program (BISP), which has reportedly lifted 23 million people out of poverty in Pakistan, between the time periods of 2001-2014 (World Bank, 2020). The government can also provide targeted subsidies to the lower income households through reducing electricity/fuel prices to increase their overall consumption.

It is also important to consider the way government spending is financed, and how different financing methods can affect consumption behaviors accordingly, thus impacting consumption and income inequality. Considering the case of debt based spending, households might not increase their expenditure, anticipating an increase in taxes in future, thus lowering the consumption and saving the significant portion of their income to pay back that debt. Households also might increase their current consumption in the short run, but the consumption will decline in medium to long run, thus not reducing the consumption inequality in longer run.

Another way spending is financed is through tax based financing, where a tax on the rich, which finances consumption of the poor will increase overall consumption. However, a tax on the poor to finance spending of the poor may not increase overall consumption. This is because the poor have higher marginal propensity to consume than the rich.

While the multifaceted impact of government spending on inequality, encompassing components like infrastructure development and direct welfare programs, reduces inequality in developed economies, the case of middle and low income countries, could be quite different. The incidence of indirect taxes and poorly targeted subsidies to lower income groups leave the poor households further poor.

Similar is the case for Pakistan, where the government spending, with enhanced focused on subsidies to industrial groups, makes it difficult for the redistributive policies to be efficient and effective in the reduction of inequality and poverty. While the progressive taxation and transfer payments are effective tools in lowering inequality, the Pakistan's regressive taxation system, relying heavily on indirect taxes, burdens the poor further, thus widening the disparities.

The income and consumption inequality can have different response to changes in the government spending. Taking the case of consumption disparity, it can be directly reduced through the transfer programs, which are however, not significant in magnitude in Pakistan. Another way of reducing consumption inequality through targeted subsidies to lower income groups to increase their consumption basket. For instance, by subsidizing the necessary food items, medicines and fuel prices for a specific group of income group that is in dire need of assistance by government, the consumption of lower income groups can be increased.

The income inequality, on the other hand, is affected mainly through increased investment in infrastructure programs, which increases the demand for labor, reducing unemployment in the economy, and thus boosting the wages of labor, causing their income to increase. Similarly, investment in education and health can also have long-term impact on the reduction of disparities in income groups.

The research is significant in the context of policy-making, as it allows policymakers to make meaningful decisions for the welfare of the marginalized groups in Pakistan. Through effective safety net programs, the focus of policymaking can be turned, from providing hefty subsidies to industrial groups, to increase targeted transfers to the lower income groups, creating a harmony in the society. Similarly, increase in development expenditure in form of increased investment in

education, health and infrastructure can ensure the inclusive economic growth, thus uplifting the poor segment of the society.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

With the overall increase in inequality worldwide, it is vital to study the government's role in effectively reducing the inequality in the economy. The case of Pakistan is no different from other countries where there has been an increase in the disparity between lower and upper income groups, and according to World Bank (2024) the inequality is further exacerbated by back to back shocks in Pakistan, including macroeconomic and political instability, Covid-19 and flood shocks, causing the welfare disparities to persist across provinces, rural and urban regions.

This study, aimed at finding the inequality trends in Pakistan, followed by how government can effectively reduce the disparities in Pakistan, observes that inequality in total income and expenditure follows a consistent trend, rising almost equally but not significantly over the time. The income components show quite peculiar behavior in change in inequality over the time, with most fluctuations shown in wages inequality from the time period 2006 to 2014, probably due to low development expenditure, the slow transition of unskilled labor from agricultural to manufacturing sector, and the rising inflation, hurting the poor by lowering their overall income (Jamal, 2009). Financial inequality, persistently remains high for all measures of inequality, indicating that lower income group's constrained access to credit makes them disadvantaged and harms their welfare.

The inequality in consumption components rise significantly over the time, where the durable goods, have the highest inequality in consumption, and significantly rise for the difference in 90th-10th percentiles, explaining how the purchasing power of lower income group for the

durable goods remain low. This could be coupled with interest sensitive expenditures, the inequality for which is also high, but declines after the 2006. This decline could be explained because of the rise in interest rate, usually associated with increase in government spending. This rise in interest rate significantly affect the consumption basket of rich, who tend to reduce their consumption of interest sensitive(durable) goods, thus causing a decline in inequality in interest sensitive expenditures. The consumption of non-durables, however, show the most stable trend, possibly because the consumption of non-durables, being the essential commodities, is not impacted by the change in prices.

The effect of spending shock on inequality in Pakistan is also evaluated to show whether the trend of reduction in inequality in response to expansionary fiscal policy is consistent with other developed and developing countries. The findings, however, show that while consumption and expenditure inequality declines after the spending shock, there is no significant impact on reduction in income inequality. Similarly, for the income components, there is decline in financial inequality while the other components of income largely remain unaffected. There is also significant decline in reduction in inequality in interest sensitive expenditures in response to spending shock.

The results show that fiscal policy in Pakistan is largely ineffective in reducing inequality in Pakistan. The government expenditure largely comprises of subsidies, whereas the transfers to poor are low, and investment in education, health and infrastructure is also small, indicating that the design of fiscal policy fails to assist the lower income groups. Similarly, the decline in spending of BISP in FY24, further exacerbates the inequality, as per World Bank's report (2024).

Given the inequitable design of fiscal policy, a few recommendations should be taken in notice. To create an environment for inclusive growth, the focus of policy making should be on the long term structural reforms in the fiscal policy. Therefore, to enhance the welfare of the society, there should be increased focus on targeted transfers and the scale of the regressive subsidies should be lowered, because the subsidies mostly benefit the upper percentiles, further widening the inequality in the country. The government should focus on providing the targeted subsidies to poor, and a proper system for the identification of such households should be established and made transparent, to avoid any discrepancy. Government can also provide short term relief in the form of targeted energy and food subsidies, and alleviate the financial burden because of the rising costs of these commodities. This can ensure that the low income groups are not prone to experience a decline in their living standards and the targeted subsidies can act as a buffer against the rise in inflation.

The investment in human capital should increase, in form of health, education and skill enhancement, to not only temporarily benefit the lower income groups (usually done through direct cash transfers) but also to empower them in the long run. Along with focusing on the spending side of the fiscal policy, the taxation side cannot be neglected, as the regressive taxation system of Pakistan increases the burden of indirect taxes on lower income group of the country. By turning its reliance from indirect to direct taxes, Pakistan can not only widen its tax base, but can also protect the lower percentiles, by ensuring that poor are not giving too much to the economy compared to what they are receiving. To make the tax system more progressive, the broadening of tax base is required, which could be done through taxing the historically under taxed sectors such as retail, agriculture and real estate. The shift of tax burden from poor to rich can benefit the welfare of marginal groups.

Although this study effectively tries to estimate the effects of spending shocks on consumption and income disparities in Pakistan, there are certain limitations that exist for this study. The first limitation is in HIES data, which is susceptible to errors. Furthermore, the inequality in both income and consumption has reportedly increased for most of the countries after the COVID-19 pandemic, however, the HIES data is available till the 2019; before the pandemic, excluding the disparities emerged from Covid-19 and flood crisis in Pakistan, which caused increase in inequality across different occupational groups in the country((Ahmad, Rehman, & Sarwar, 2022). Similarly, the available data has detailed consumption categories from which the consumption inequality is calculated, which could be prone to recall bias when respondents struggle to report the accurate consumption of items. Also, due to the unavailability of quarterly data for fiscal variables like government expenditures and revenues (which are essential in shock identification) for early time period of 1999 and 2000, the yearly data for these variables was interpolated using Eviews and converted into quarterly frequency. However, the interpolated data assumes the even distribution of the data, failing to capture the seasonality in the data set. Furthermore, the study draws on conclusion based solely on the government expenditure side of fiscal policy, whereas the impact of effective taxation on reducing inequality is not taken into account in this study. Future research can make use of the taxation system of Pakistan and analyze its role in either hampering or raising the inequality.

References

Agnello, L., & Sousa, M. R. (2014). How does fiscal consolidation impact on inequality. *Review of Income and Wealth, 60*(4), 702-726.

Aguiar, M., & Bils, M. (2015). Has Consumption Inequality Mirrored Income Inequality. *American Economic Review, 105*(9), 2725–2756.

Ahmad, N., Rehman, F. U., & Sarwar, N. (2022). COVID-19 induced national lockdown and income inequality: evidence from Pakistan. *Oxford Development Studies*, 66-81.

Ali, A., Hakim, R., & Abdullah, H. (2017). *Relationship between Government spending on education and economic growth of Pakistan.*

Alpanda, S., Song, H., & Zubairay, S. (2021). Household Debt and the Effects of Fiscal Policy. (No. 20210928-001).

Anderson, E., D'Orey, M. A., Duvendack, M., & Esposito, L. (2017). Does Government Spending affect income inequality? A Meta-Rgression Analysis . *Journal of Economic Surveys* , 961-987.

Anderson, E., Inoue, A., & Rossi, B. (2016). Heterogeneous Consumers and Fiscal Policy Shocks. *Journal of Money, Credit and Banking, 48*(8), 1877-1888.

Arif, U., & Yasmin Javed, A. (2009). Dynamic Effects of Changes in Government Spending in Pakistan's Economy. *The Pakistan Development Review, 48*, 973-988.

Asad, M. A., & Ahmad, M. (2011). Growth and Consumption Inequality in Pakistan. *Pakistan Economic and Social Review, 49*(1), 69-89.

Asghar, N., Hussain, Z., & Rehman, H. U. (2012). The impact of government spending on poverty reduction: Evidence from Pakistan 1972 to 2008. *African Journal of Business Management,, 6*(3), 845-853.

Attanasio, O. P., & Pistaferr. (2016). Consumption Inequality. *Journal of Economic Perspectives*, 3–28.

Attanasio, O. P., & Pistaferri, L. (2016). Consumption Inequality. *Journal of Economic Perspectives, 30*(2), 3-28.

Auerbach, A. J., & Gorodnichenko, Y. (2012). Fiscal Multipliers in Recession and Expansion. *National Bureau of Economic Research*, 63 - 98.

Auerbach, A. J., & Gorodnichenko, Y. (2013). Output Spillovers from Fiscal Policy. *American Economic Review, 103*(3), 141-146.

Aye, G. C., & Odhiambo, N. M. (2022). Dynamic effect of fiscal policy on wealth inequality: Evidence from middle-income countries. *Cogent Economics & Finance, 10*(1).

Bank, W. (2022). *Poverty and Shared Prosperity World Bank.* World Bank.

Batool, Z., Haroon, M., & Sohail, M. (2022). Assessing the Contribution of Physical and Financial Infrastructure to Inclusive development in Pakistan. *Pakistan Journal of Social Research,, 4*(2), 514-525.

Cevik, S., & Correa-Caro, C. (2020). Growing (un)equal: fiscal policy and income inequality in China and BRIC+. *Journal of the Asia Pacific Economy, 25*(4), 643-653.

Clements, M. B., de Mooij, R. A., Gupta, M. S., & Keen, M. M. (2015). *Inequality and Fiscal Policy.* International Monetary Fund.

Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2012, August). Innocent Bystanders? Monetary Policy and Inequality in the U.S. *IMF Working Paper*. Retrieved from https://www.imf.org/external/pubs/ft/wp/2012/wp12199.pdf

Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2017, August). Innocent Bystanders? Monetary Policy and Inequality . *Journal of Monetary Economics, 88*, 70-89. Retrieved from https://www.imf.org/external/pubs/ft/wp/2012/wp12199.pdf

Dhital, S., Jiang, S., & Reese, J. (2023). Effects of monetary and government spending policy on economic inequality. *Journal of Macroeconomics, 77*, 103547.

Farooq, N. (2016). Public Expenditures and Economic Growth: A Case study of Pakistan. *American Journal of Social and Management Sciences , 10*(2), 33-41.

Fisher, J., Johnson, D., Latner, J., Smeeding, T., & Thompson, J. (2016). Inequality and Mobility using Income, Consumption, and Wealth for the Same Individuals. *RSF: The Russell Sage Foundation Journal of the Social Sciences, 2*(6), 44-58.

Furceri, D., Ge, J., Loungani, P., & Melina, G. (2022). The Distributional Effects of Government Spending Shocks in Developing Economies. *Review of Development Economics, 26*(3), 1574-1599.

Furceri, D., Loungani, P., & Zdzienicka, A. (2018). The Effects of Monetary Policy Shocks on Inequality. *Journal of International Money and Finance, 85*, 168-186.

Galí, J. (1999). Technology, Employment, and the Business Cycle: Do Technology Shocks Explain Aggregate Fluctuations? *American Economic Review, 89*(1), 249-271.

Galí, J., López-Salido, D. J., & Vallés, J. (2007). Understanding the Effects of Government Spending on Consumption. *Journal of the European Economic Association, 5*(1), 227-270.

Ghani, J. A. (2014). The Emerging Middle Class in Pakistan: How it Consumes, Earns, and Saves. *International conference on marketing .*

Gunasinghe, C., Selvanathan, E. A., Naranpanawa, A., & Forster, J. (2020). Rising income inequality in OECD countries: does fiscal policy sacrifice economic growth in achieving equity? *The European Journal of Development Research , 33*, 1840–1876.

Hamid, A., & Akram, N. (2014). Multi-dimensional income inequality in Pakistan. *International Journal of Economics and Business Research, 8*(1), 21-35.

Hassett, K. A., & Mathur, A. (2012). A New Measure of Consumption Inequality. *AEI Economic Studies*.

(2020). *Household Integrated Economic Survey 2018-19.* Pakistan Bureau of Statistics .

Idrees, M., & Ahmad, E. (2010). Measurement and decomposition of consumption inequality in Pakistan. *The Lahore Journal of Economics, 15*(2), 97-112.

Jamal, H. (2009). *Income Inequality in Pakistan; Trends, Determinants and Impact.* UNDP.

Jordà, Ò. (2005). Estimation and Inference of Impulse Responses by Local Projections. *American Economic Review, 95*(1), 161-182.

Jordà, Ò. (2023). Local Projections for Applied Economics. *Annual Review of Economics, 15*, 607-631.

Khan, R. E., & Hashmi, B. J. (2015). Fiscal policy and income inequality in pakistan: An ARDL approach. *European Journal of Economic Studies*, 161-174.

Khan, S., & Padda, I. u. (2021). The Impact of Fiscal Policy on Income Inequality: A Case Study of Pakistan . *The Lahore Journal of Economics*, 57-84.

Krueger, D., & Perri, F. (2006). Does Income Inequality Lead to Consumption Inequality? Evidence and Theory. *The Review of Economic Studies, 73*(1), 163-193.

Li, D., Plagborg-Møller, M., & Wolf, C. K. (2024). Local Projections vs. VARs: Lessons From Thousands of DGPs∗. *Journal of Econometrics*, 105722. doi:10.3386/w30207

Lustig, N. (2016). Fiscal policy, inequality and the poor in the developing world. *Center for Global Development, 441*.

Ma, E. (2019). The Heterogeneous Responses of Consumption between Poor and Rich to Government Spending Shocks. *Journal of Money, Credit and Banking, 51*(7), 1999-2028.

(2024). *Macro Poverty Outlook, Country-by-country Analysis and Projections for the Developing World.* World Bank.

Makin, A. J., & Layton, A. (2021). The global fiscal response to COVID-19: Risks and repercussions. *Economic Analysis and Policy, 69*, 340-349.

Mehmood, Y., Arshad, M., & Bashir, M. K. (2023). Household income and food security during the COVID-19 pandemic in the urban slums of Punjab, Pakistan. *Local Environment, 28*(12), 1573-1589.

Meyer, B. D., & Sullivan, J. X. (2003). Measuring the Well-being of the poor Using Income and Consumption. *National Bureau of Economic Research*. doi:10.3386/w9760

Meyer, B. D., Mok, W. K., & Sullivan, J. X. (2015). Household Surveys in Crisis. *Journal of Economic Perspectives, 29*(4), 199–226.

Meyer, B., & Sullivan, J. X. (2009). Five decades of consumption and income poverty . *National Bureau of Economic Research*.

Meyer, B., & Sullivan, J. X. (2012). Identifying the Disadvantaged: Official Poverty, Consumption Poverty, and the New Supplemental Poverty Measure. *Journal of Economic Perspectives, 26*(3), 111-136.

Munir, K., & Riaz, N. (2020). Macroeconomic Effects of Exogenous Fiscal Policy Shocks in Pakistan: A Disaggregated SVAR Analysis. *Hacienda Publica Espanola, 233*, 141-165.

(2024). *Pakistan Development Update; Fiscal Impact of Federal State Owned Enterprises.*

(2024). *Pathways out of poverty: a cluster analysis* . Poverty and Equity, World Bank.

Ramey, V. (2016). *Handbook of Macroeconomics* .

Romer, C. D. (2021). The Fiscal Policy Response to the Pandemic . *Brookings Papers on Economic Activity*, 89-110.

Weonho, Y., Jan, F., & Sugata, G. (2012). Macroeconomic Effects of Government Spending Shocks: New Evidence Using Natural Disaster Relief in Korea.

Zakir, N., & Malik, W. S. (2013). Are the effects of monetary policy on output asymmetric in Pakistan? *Economic Modelling, 32*, 1-9.

Zulfiqar, K. (2018). Fiscal Policy for Inclusive Growth: A case study of Pakistan. *Pakistan Economic and Social Review, 56*(1), 21-46.

Zulfiqar, K., Chaudhary, M. A., & Aslam, A. (2016). Financial Inclusion and its implications for inclusive growth in Pakistan. *Pakistan Economic and Social Review, 54*(2), 297-325.

Appendix:

Data Chapter:

This section describes the data construction for the benchmark sample for this study, using files from Household Integrated Economic Survey. HIES data is cross sectional data collected and published by Pakistan Bureau of Statistics. The data from micro files of HIES from 1999Q4 to 2019Q4 is collected for further analysis. The focus variables are all consumption and income variables, however, the household characteristics are also extracted from the data files including age, number of household members, education and gender. Mainly the information about household head is retained, because they play a significant role in decision making related to consumption.

Given that HIES data is cross sectional data, where duplicate Household Id's can exist across the years, unique ID for each household from 1999Q4 to 2019Q4 are assigned for unique identification of each household.

For this study, the quarterly data of households spanning from 1999 to 2019 is used. Given the unavailability of information for the first three quarters of the year 1999, all of the observations for that year start from the 4th quarter. The disaggregate data of number of households, organized by year and quarter is given below.

Table 2. HIES disaggregated data from 1999Q4 to 2019Q4.

Years	Quarters				Total Households
	Q1	Q2	Q3	Q4	
1999	0	0	0	14,835	14,835
2002	2,820	4,488	4,411	3,193	14,912
2005	3,655	3,607	3,334	3,380	13,976
2006	3,733	3,712	3,666	3,608	14,719
2008	3,749	3,739	3,749	3,765	15,002
2011	3,937	3,933	3,897	3,934	15,701
2012	3,676	3,742	3,841	3,849	15,108
2014	4,473	4,400	4,382	4,244	17,499
2016	6,026	6,127	6,020	5,999	24,172
2019	6,210	6,242	6,196	6,087	24,735
Total HHs	38,279	39,990	39,496	52,894	170,659

Consumption and income variables are important variables for the analysis, as mentioned earlier, so these variables are aggregated into categories based on their nature. The final income variables are wages, financial income, other income and total income. The wages, include all income from salaries, daily wages, wages in kind and income from the secondary occupation, if any. Similarly, financial income includes savings, interest earned on savings, income from jewelry sold, dividend and stocks, net loan, benevolent fund and group insurance. Business income includes all kind of agricultural and non-agricultural business income, including the property business. Other income, includes the passive income one receives without engaging in any work, i.e., pensions, income from quantities sold, and transfers received. Finally, total income is sum of all the incomes.

Consumption variables are categorized on the nature of their durability. The non-durable goods are goods that are perishes quickly, such as food, medicines, footwears, and fuel etc. Durable

goods, on the other hand, are expected to not wear out quickly and have a life expectancy of more than one year, including vehicles, household appliances, furniture etc.

Once the consumption and income variables are constructed, all the three measures of inequality; Cross sectional standard deviation, Gini Coefficients, and difference between 90th and 10th percentiles are calculated using data from consumption and income variables to estimate the consumption and income inequality level in Pakistan. All the measures of inequality are then seasonally adjusted using X12.
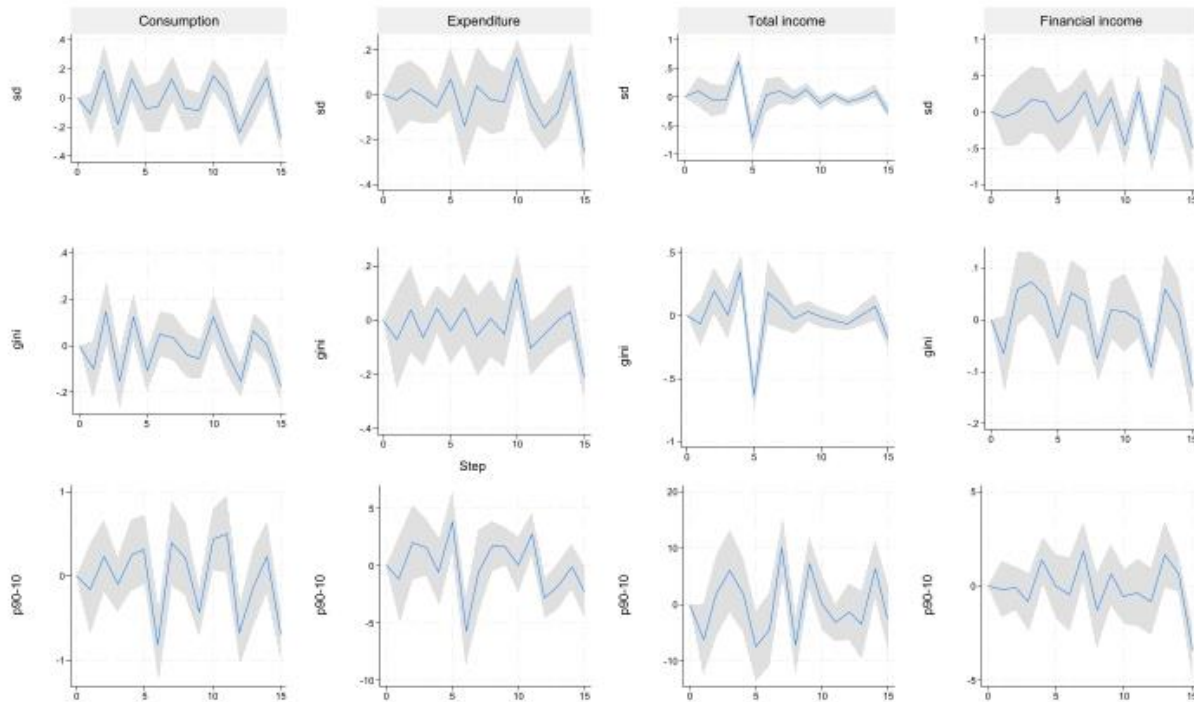

Figure 10. **Effect of Government Development Spending on overall inequality**
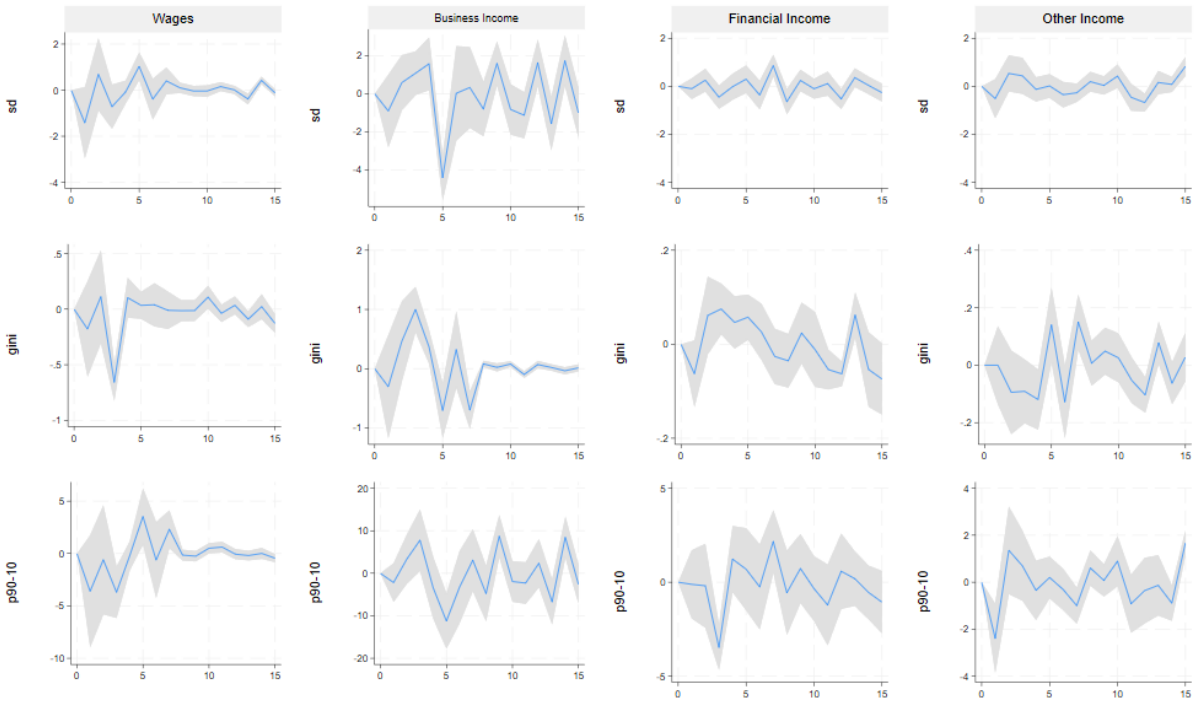
Figure 11. **Effect of Government Spending on inequality in income components**
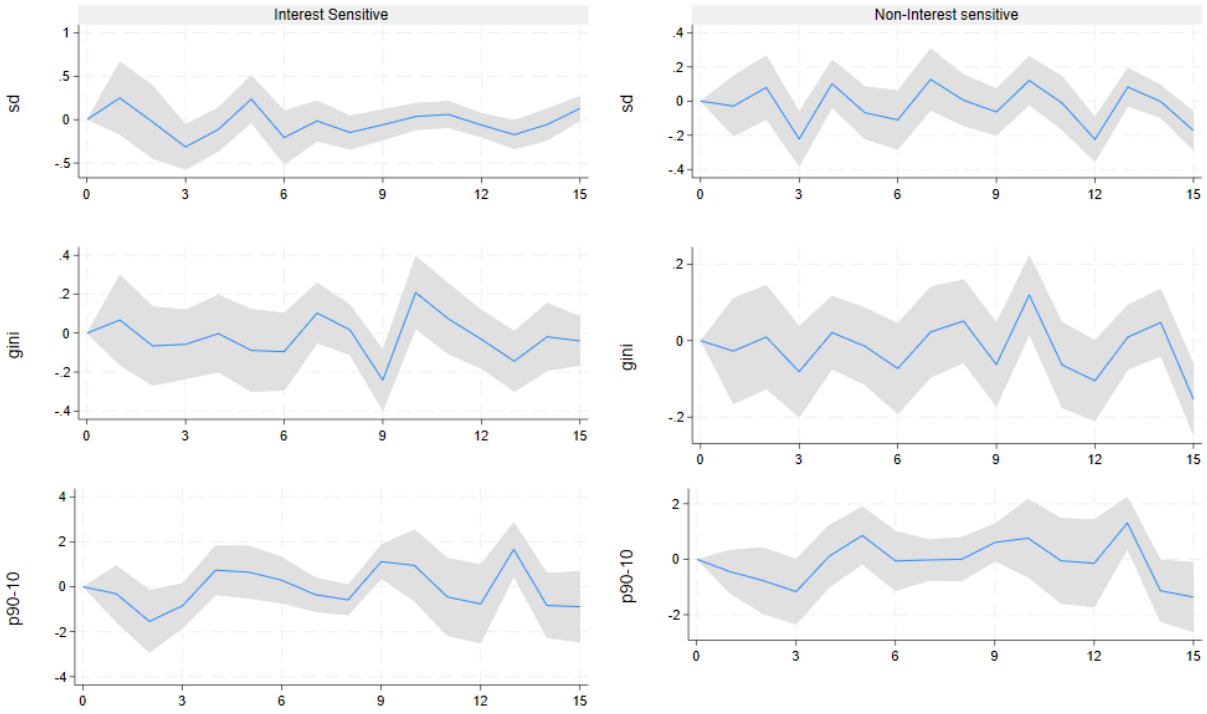
Fig.12 Effect of Government Development Spending on Interest and Non-interest sensitive expenditures