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Unraveling the Nexus: Social Spending, Development, and Breaking the Cycle of Poverty

Yasmin Shehata
y.shehata@aucegypt.edu

The American University in Cairo

School of Business

Unraveling the Nexus: Social Spending, Development, and Breaking the Cycle of Poverty

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Yasmin Shehata

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Dr Noha Omar

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Abstract

This study examines the role of development, as indicated by the Human Development Index (HDI), in shaping the connection between social public spending on health, education, and social protection and poverty in terms of the poverty headcount ratio at \$3.65/day (2017 PPP). Empirical analysis is used to this end, employing a panel dataset of 68 countries at varied stages of development over the period 1995-2021. The empirical model is estimated using the Fixed Effects Two-stage Least Squares (2SLS). It is also re-estimated using the Instrumental Variable Generalized Method of Moments (IV-GMM) and Limited Information Maximum Likelihood (LIML) to test the robustness of the results. The 2SLS results reveal a significant negative effect of development on the effectiveness of social public spending to reduce poverty. In other words, the correlation between social public spending and poverty becomes more negative at higher HDI levels. These results are robust to different estimation techniques.

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List of Abbreviations

ARDL	**Autoregressive Distributed Lag**
COFOG	**Classification of the Functions of Government**
ECM	**Error Correction Model**
FEM	**Fixed Effects Model**
FGLS	**Feasible Generalized Least Squares**
GDP	**Gross Domestic Product**
GFS	**Government Finance Statistics**
GMM	**Generalized Method of Moments**
GNI	**Gross National Income**
HDI	**Human Development Index**
IMF	**International Monetary Fund**
IV	**Instrumental Variable**
LIML	**Limited Information Maximum Likelihood**
OLS	**Ordinary Least Squares**
PLS-SEM	**Partial Least Squares Structural Equation Model**
PPP	**Purchasing Power Parity**
REM	**Random Effects Model**
SDGs	**Sustainable Development Goals**
SUR	**Seemingly Unrelated Regression**
2SLS	**Two Stage Least Squares**
UNDESA	**United Nations Department of Economic and Social Affairs**
UNDP	**United Nations Development Programme**
VECM	**Vector Error Correction Model**
WDI	**World Development Indicators**
WESP	**World Economic Situation and Prospects**
WGI	**Worldwide Governance Indicators**

1. Introduction

"Poverty is the worst form of violence." - **Mahatma Gandhi**

"Poverty is the parent of revolution and crime." - **Aristotle**

"Poverty is not an accident. Like slavery and apartheid, it is man-made and can be removed by the actions of human beings." - **Nelson Mandela**

Conquering poverty remains an immense global challenge due to the complex multifaceted nature of poverty, transcending mere income limitations and affecting diverse populations across different stages of development. According to the World Bank's latest data, approximately 24 percent of the world's population still lives on less than $3.65 per day (World Development Indicators, 2019). An additional 165 million people are projected to fall below this poverty line between 2020 and 2023 (Ecker et al., 2023). Also, the path to ending poverty by 2030 as the first of the Sustainable Development Goals (SDGs) of the United Nations seems to be increasingly precarious due to several disruptions spanning the COVID-19 pandemic (Sumner, 2020), the Ukrainian-Russian war (Ecker et al., 2023), the escalation of the Palestinian-Israeli conflict, and the deteriorating climate changes that threaten to exacerbate inequalities in health, food access, and vulnerability to natural disasters (Jafino et al., 2020).

Evidently, income poverty is only the tip of the iceberg as poverty manifests in various other forms of deprivation including limited access to education or healthcare, inadequate housing, and poor sanitation (Sen, 1999). Many scholars such as Amartya Sen, Sabina Alkire, and James Foster have played an instrumental role in developing this multidimensional approach to analyzing and measuring poverty (Alkire & Santos, 2010; Alkire & Foster, 2011; Sen, 1999). Moreover, although income is the focal point of the World Bank's poverty monitoring, it recognizes the significance of multidimensional poverty in complementing income-based measures of poverty (Diaz-Bonilla et al., 2022). Despite the multidimensional nature of poverty, it is usually measured using one dimension, namely income. Proponents of measuring poverty using income suggest that the

income level indicates whether people can fulfill their basic needs such as food, shelter, and clothing (Ravallion et al., 2008). In this study, an income poverty measure, specifically the poverty headcount index, is employed due to data limitations related to multidimensional poverty. Data for the main multidimensional poverty measure developed by the United Nations, namely the Multidimensional Poverty Index (MPI), is not available before 2010 and it covers only 110 developing countries (UNDP, 2023). Also, only few data are available for the Multidimensional Poverty Measure (MPM), initiated by the World Bank inspired by the MPI covering only 121 economies.

The endeavor of alleviating poverty requires collaboration between international organizations, governments, non-governmental organizations, private entities, and informal financial support systems. However, this study specifically focuses on the role of governments in combating poverty, with particular emphasis on their social spending, including social protection, health, and education spending.

The focus on the role of social public spending in poverty reduction arises from the recognition of fiscal policy as a vital redistributive tool assisting in poverty and inequality reduction, combined with the acknowledgement of the paramount importance of determining the optimal level of government spending and achieving the best allocation of the government resources. Social spending can address the immediate needs of those living in poverty and help them access the necessary resources to improve their living conditions through social protection programmes. Moreover, it can have long-term effects on poverty reduction by investing in human capital to break the cycle of intergenerational poverty. Therefore, we include health, education and social protection spending in the measure of social spending. However, careful decision-making for government spending is primordial for two primary reasons.

Firstly, the fundamental economic problem of limited resources necessitates the consideration of opportunity costs associated with government spending. Expenditure in one area implies forgoing potential investments or initiatives in other areas, highlighting the need for prudent allocation of resources.

Secondly, the global trend towards fiscal consolidation further underscores the importance of governments informed decisions regarding their spending priorities (Ortiz & Cummins, 2013). This universal trend is particularly prompted by the austerity conditions imposed by the Bretton

Woods institutions through Structural Adjustment Programs in developing countries (Fan, 2008) as well as the austerity measures implemented by developed economies to mitigate effects of economic crises, reduce budget deficits, and/or control growing public debts (Batini et al., 2012).

Although both developed and developing countries grapple with poverty, the latter struggles disproportionately under its weight. Burdened by higher poverty rates, limited resources, and consequently higher debt rates, developing nations find themselves in a precarious position. Despite the efforts to relief debt burden and provide loans to the world's poorest countries such as the Heavily Indebted Poor Countries Initiative- launched by the International Monetary Fund (IMF) and World Bank in 1996- and the Poverty Reduction and Growth Facility -launched by the IMF in 1999- (O'Donnell et al., 2007), poverty rates in the developing world remain stubbornly high (Figures 1 and 2). Therefore, it is intriguing to question whether there are inherent characteristics associated with lower development that compromise the ability of these countries to fight poverty and impede their efforts, including social public spending, to achieve their desired goals. In the quest of identifying the development role in shaping the social spending and poverty nexus, the Human Development Index (HDI) is employed as an indicator of the degree of development due to its composite nature, reflecting various development aspects in addition to allowing to detect subtle differences in development between countries and in one country over time.

Figure 1. World Map of HDI levels (2021)
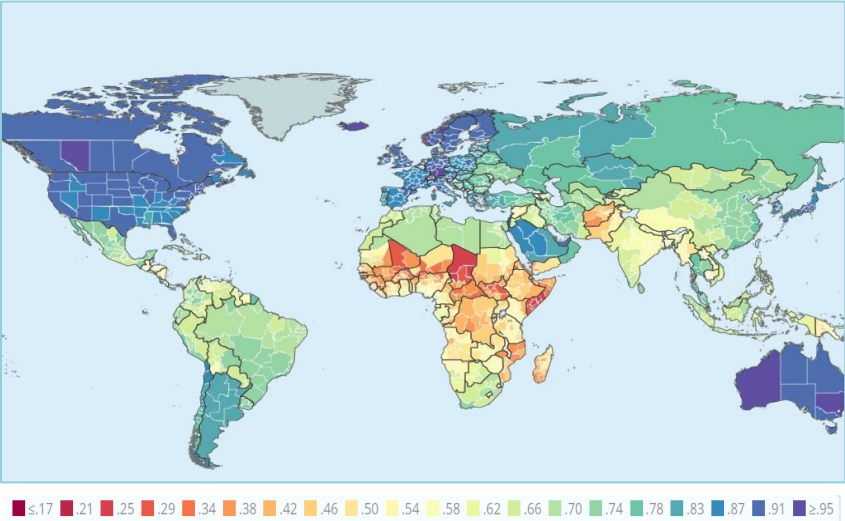
Source: Global Data Lab

Figure 2. World Map of Poverty Rates at $3.65/day (2017 PPP) (2019)
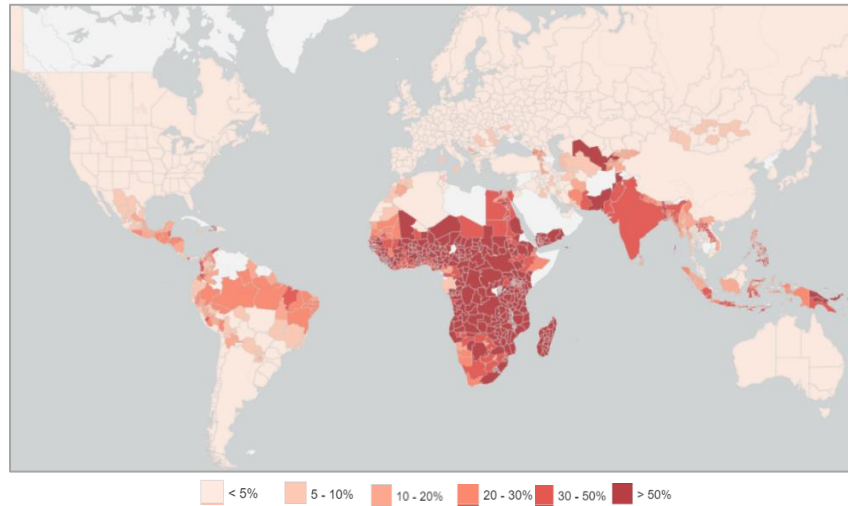
Source: Geospatial Poverty Portal, World Bank

The role of social public spending in poverty alleviation is heavily debated in theory and has relatively mixed evidence in empirical studies (Anderson et al., 2018; Agostini et al., 2010). Nonetheless, cross-national studies on the issue, especially those involving countries at different stages of development, are relatively few. Also, to our knowledge, there are no attempts to study the role of development in determining the social public spending correlation with poverty.

Therefore, to fill this research gap, we address the following question through our study: 'To what extent does the state of development influence the relationship of social public spending and poverty in 68 countries at varied stages of development over the period 1995-2021?'. Specifically, this study aims at examining the connection between social public spending (health, education, and social protection) and poverty, measured by the Poverty headcount ratio at $3.65/day (2017 PPP), conditional on the state of development, measured by HDI, across 68 countries at different development stages over the period 1995-2021. It is hypothesized that development, social public spending, and their interaction are negatively correlated to poverty. In other words, as the state of development improves or social public spending increases, the poverty rate is expected to decrease. In addition, the correlation between social public spending and poverty is anticipated to be more negative at later stages of development. To quantitatively test these hypotheses, a panel Fixed Effects Model (FEM) is estimated using Two-Stage Least Squares (2SLS).

The study is structured as follows: Following the introduction, chapter 2 offers a review of relevant theories to social public spending and poverty and selected empirical literature studying the relationship of social public spending and poverty as well as the role of country characteristics in affecting this relationship. Chapter 3 presents an analysis of social public spending and poverty across different regions and development levels. Chapter 4 is dedicated to empirical analysis, laying out the methodology, data, and econometric model used in the study and its limitations. Chapter 5 analyses the empirical findings of the used econometric model and its robustness checks. Finally, chapter 6 concludes with policy recommendations and directions for future research.

2. Reviewing the Effectiveness of Social Public Spending for Poverty Alleviation

The prolonged debate on social public spending effects on poverty primarily stems from the conflicting causal theories of poverty in addition to the contrasting views regarding government intervention in the economy. In an attempt to resolve this controversy, a vast body of empirical research explores the impact of different types of social public spending on various forms of poverty. In this chapter, we delve into the diverse strands of theory on social public spending and poverty in addition to the most relevant empirical literature examining their intertwined relationship.

2.1. Theoretical Framework for Social Public Spending and Poverty

Economic ideologies diverge in their understanding of the root causes of poverty, leading to varied opinions on the role of the welfare state. Classical, neoclassical, and neoliberal schools lean towards an individualistic view, attributing poverty primarily to personal characteristics. This predisposition translates into minimal support for government intervention among classical and neoclassical theorists. Neoliberals, however, while upholding personal responsibility, acknowledge the role of public spending in addressing inequalities and advocate for economic growth as the primary engine of poverty reduction (Musahara, 2004; Davis & Sanchez-Martinez, 2014; Calnitsky, 2018).

On the other hand, Keynesians and Marxists view poverty as a structural phenomenon embedded in macroeconomic conditions. Hence, for Keynesians, public spending plays a central role in poverty alleviation (Pressman, 1991). Keynes identifies multiple channels through which government expenditure can reduce poverty, including economic growth, human capital improvement by spending on health and education, and transfer programs (Pressman, 1991 and Davis & Sanchez-Martinez, 2014). Similarly, Marxists advocate for government intervention, but focus on regulating markets and ensuring higher wages (Blank, 2003). They argue that income growth alone may not be inclusive, potentially bypassing poorer segments of society.

In fact, harnessing the full potential of social public spending as a poverty reduction tool demands thorough consideration of the intricate network of factors that shape its impact. Targeting the expenditure to the poor on welfare or workfare, a seemingly obvious cornerstone to efficient

social public spending (Atkinson,1995; Ibarra et al., 2019; O'Donnell et al., 2007 and Westmore, 2018), sparks intense debates. [1] Contrasting the extensive support of targeted schemes, Ravallion & Datt (1995) claim that targeting on workfare reduces poverty less than universal cash handouts. In addition, targeting on welfare is criticized for driving people to provide inaccurate information, distorting incentives, stigmatizing the poor, and increasing administrative costs (Sen, 1995). Moreover, Besley and Coate (1992) affirm that welfare programs have been found to reduce the incentive to obtain the needed human capital to escape poverty. But indeed, there is a trade-off between the high administrative costs associated with targeting and leakage of resources to non-poor in universal poverty reduction schemes (Besley, 1990).

Moreover, behavioral responses to public interventions, such as changes in consumption patterns, savings, and labor supply choices by the poor, can significantly impact the efficiency of poverty spending (Townsend, 1979; Ravallion & Datt, 1995; Van de Walle, 1998). Likewise, the level of governance plays a crucial role in determining the distributive outcomes of social spending, ultimately affecting poverty levels (Prasetyo & Zuhdi, 2013; Wong, 2017)[2]. In addition, the source of funding for social public spending has its own set of complexities. Tax-based financing, for instance, can disproportionately burden the poor (Higgins & Lustig, 2016; Inchauste & Rubil, 2017). Public borrowing, while seemingly attractive, can lead to soaring debt and potentially negative impacts on economic growth and poverty reduction (Anderson et al., 2006). Finally, crowding out private sector investments through excessive public spending can negate its positive effects on poverty reduction (Rajkumar & Swaroop, 2008).

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[1] While welfare programs impose no restrictions on the recipients, workfare programs- also known as "Public Employment Schemes"- are self-targeted programs where individuals should provide labor in exchange for benefits. Proponents of targeting on workfare assume that it reduces the leakage of benefits to the nonpoor as only the poor will be motivated to participate in them (Van de Valle and Nead, 1995).

[2] According to World Bank (2007), ''Governance refers to the manner in which public officials and public institutions acquire and exercise the authority to provide public goods and services, including the delivery of basic services, infrastructure, and a sound investment climate. Corruption is one outcome of weak governance''. The World Bank measure of governance includes six indicators: Corruption control, Rule of law, Government effectiveness, Voice and Accountability, Political stability and Absence of violence, and Regulatory quality.

2.2. Beyond Theory: Empirical Insights on the Social Public Spending Relationship with Poverty

A rich body of empirical literature, dominated by time-series and panel studies, quantifies the relationship of social public spending and poverty. These studies scrutinize the impacts of different spending categories such as health, education, social protection, infrastructure, and agriculture spending on a range of poverty facets such as income, energy (Bousnina & Gabsi, 2023 and Nguyen & Su, 2022), child (Nygard et al., 2019 and Sanchez & Navarro, 2021), and rural poverty (Fan et al., 2000 and Fan et al., 2008).

Some studies also investigate the effect of public spending on other societal outcomes such as inequality (Furceri et al., 2022 and Sedik, 2021), welfare (Breisinger et al., 2021 and Hendren & Sprung-Keyser, 2020), wellbeing (Haushofer & Shapiro, 2016), food security (Hidrobo et al., 2018), and health and education outcomes (Artige & Cavenaile, 2023, Gupta et al., 2002b, Orji et al., 2021, Rajkumar & Swaroop, 2008, and Urzua, 2019).

The studies that explore the relationship between social spending and poverty, either adopt the microeconomic, which discusses individual or household poverty (Banerjee et al., 2015; Blattman et al., 2020; Han et al., 2022; Skoufias et al., 2013; Westmore, 2018) or the macroeconomic framework, which takes a wider view to assess the correlation on entire regions or countries.

This section focuses on the macroeconomic strand of the literature exploring the impact of various social public spending types on income/multidimensional poverty. It embarks on surveying relevant research on this direct link, then delves into studies examining how country-specific factors shape this intricate relationship.

Before delving deeper into the specific details of individual studies, it would be useful to highlight some of their overarching features. In examining the relationship between public spending and poverty across the studies, the outcome variable of poverty is consistently measured by the poverty headcount ratio, poverty gap, or per capita income. Also, the main independent variable is measured by the different types of social public spending, either per capita or as percentage of GDP. While the selection of control variables varied across studies, a shared commitment to examining the role of GDP is evident. All studies unanimously control for GDP

using real GDP, real GDP per capita, or their growth rates. This reflects the held belief that GDP plays a key role in poverty reduction (Glick & Menon, 2009). The control variables further encompassed a broad range of factors, including inequality measures (e.g., Gini index), demographic indicators (e.g., age dependency ratio and population trends), governance quality, educational levels, foreign aid, private credit, trade volume, and inflation and unemployment rates, etc.

2.2.1. The Social Public Spending and Poverty Nexus

Unveiling the intricate link between social public spending and poverty has been a quest for decades. A quite consistent negative relationship between social public spending and poverty is revealed from research on developed countries, which is rather limited. However, studies focusing on developing economies paint a more nuanced picture with more mixed findings.

One of the pioneers to study the relationship in developed countries is Kenworthy (1999), who finds a positive relationship between social spending and poverty reduction, using data for 15 industrialized countries over the period 1960-1991 and Ordinary least Squares (OLS).

In addition, Jung et al. (2015) uses panel data to estimate a Fixed Effects Model (FEM), assessing the impact of education, health, and public welfare spending in 1420 southern counties across 16 states in the United States for the years 1990, 2000, and 2010. Although contributing to the understanding of the social spending and poverty link in developed countries, the study only focuses on poverty hot-spot counties. The results show that increases in education spending reduce poverty rates in a poverty hot-spot county and its neighbouring counties, while increases in health spending are accompanied by higher poverty rates in neighbouring counties. Also, increases in public welfare spending do not affect poverty rates inside or outside the county.

Finally, Cammeraat (2020) employs a panel of 22 member countries of the European union and the Organization for Economic Cooperation and Development spanning 1990 to 2015 to estimate the model using both OLS and 2SLS with year and country fixed effects. The author finds that public social expenditure (unemployment, health, housing, family, incapacity, and old age) is negatively related to poverty and inequality. Moreover, social expenditure on family, housing and unemployment turns out to have the greatest effect on poverty reduction.

On the other hand, studies on developing countries present a less-conclusive picture. For example, Ousundina et al. (2014) assess the impact of government spending on construction, transportation, education, and health on poverty in Nigeria using time-series analysis for the period 1970-2012 with Vector Error Correction Model (VECM). They find a significant positive effect of construction public spending on per capita income. They equally find a significant negative effect of transportation spending on per capita income. Nonetheless, they reveal an insignificant effect of health and education spending.

Similarly, Omari & Muturi (2016) employ a VECM to find an insignificant education spending effect on poverty in Kenya from 1964 to 2010. Their time-series analysis also reveals a robust long-run relationship between specific government spending sectors and poverty levels and a negative relationship between infrastructure spending and poverty reduction. They suggest allocating resources to agriculture and health sectors to effectively reduce poverty.

In addition, Sasmal & Sasmal (2016) estimate FEM and Random Effects Model (REM) for a panel of 21 major Indian states during the period 1990-2010 to assess the effect of capital (investment for long-term growth), revenue (wages and salaries, pension, subsidy and allowances and interest payment on public debt), infrastructure (irrigation, power, roads, transport, and communication), and social services (health, education, social security, nutrition, and sanitation) expenditure on poverty. The results imply that although social services expenditure helps in reducing poverty, infrastructure spending contributes most to poverty reduction.

Contrary to previous studies, Oriavwote & Ukawe (2018), show a positive significant impact for all types of spending (health, education, and construction) on per capita income in Nigeria throughout the period 1980-2016 using the Error Correction Model (ECM) and OLS estimation.

Taruno (2019), however, finds that health and education spending have a significant negative effect on poverty rate in rural areas in Indonesia while only health spending proves to be effective in urban areas. Also, social protection spending turns out to be insignificant to poverty reduction in rural and urban contexts. The author uses a panel of 31 provinces in Indonesia for the years 2009-2018 with FEM and REM. This matches the findings of Alamanda (2020), who shows that social aid, subsidies, and grants have an insignificant effect on poverty rates, while infrastructure expenditure has a significant negative effect, especially in rural areas. The author also uses a panel of 33 provinces in Indonesia over the period 2005-2017 with FEM, REM, and Seemingly Unrelated Regression (SUR).

Moreover, using Autoregressive Distributed Lag (ARDL) model with time-series data for 1990-2018 in Nigeria and differentiating between current and capital public expenditures, Obayori (2020) finds that capital public expenditure has a negative significant impact on poverty, while current expenditure has a positive impact on poverty.

This is in line with results of Joy et al. (2021), who examine the effect of public capital expenditure on poverty rate in Nigeria, using data for the period 1981-2015 and ARDL to reveal a statistically significant relationship between increased capital spending and poverty reduction. Based on their findings, they recommend prioritizing investments in sectors like education, healthcare, electricity generation, and economic services to effectively address poverty challenges in Nigeria.

However, these results slightly contradict Falade & Babatunde (2021), who equally investigate the effect of capital and current expenditure on poverty and unemployment in Nigeria over the period 1980-2017 using ARDL to find that administrative and transfer components of capital public expenditure reduce poverty in both the short and long run, while capital expenditure on economic and social services has no direct impact on poverty. Moreover, they find that functional current expenditure has no significant relationship with poverty in the short and long run.

A crucial landmark summarizing the state of research in public spending and poverty literature is Anderson et al. (2018). The authors perform a meta regression analysis for the relevant literature with special focus on low- and middle-income countries. They find no evidence to support the hypothesis that higher public spending reduces income poverty in these countries, prompting closer attention to the role of different country characteristics such as region, degree of development, and governance level in determining the extent to which public spending affects poverty. Inspired by their findings and building upon their valuable insights, our research concentrates on how the state of development shapes this complex relationship.

2.2.2. The Role of Country Characteristics

Amid the diverse constellation of country characteristics influencing social public spending and poverty, governance takes center stage. The direct impact of governance on poverty levels and its mediating role in subtly shaping how effectively social public spending translates into positive poverty outcomes are both studied in the literature.

Gupta et al. (2002a) use OLS and Instrumental Variable (IV) techniques to study the relationship between corruption, poverty, and inequality in a cross-section of developed and developing countries during the period 1980-1995. The authors demonstrate that an increase of one standard deviation in corruption growth rate is associated with a decrease of 1.6 percentage points in income growth of the poor per year. They also affirm that income growth of the poor is higher in countries with higher social spending. Also using panel data, Agostini et al. (2010) show that the impact of cash transfers in reducing poverty and inequality is affected by the amount of transfers and the quality of local government. They use county-level data from 13 regions in Chile in 2002/03 to estimate a SUR model.

Adding the development dimension to their study of the direct link between governance and poverty, Kwon & Kim (2014) investigate the data of 98 countries (32 least developed and 66 lower and upper middle-income countries) over the period 2002-2009 using pooled OLS. They conclude that good governance helps in alleviating poverty only in middle-income countries but not in least developed ones.

Furthermore, Takeshima et al. (2021) emphasize that improved governance is positively associated with poverty reduction in 120 countries of various income categories. They equally suggest that public spending on agriculture and health play an important role in achieving SDGs, while spending on education and social protection show mixed effects on poverty. This matches the results of Fagbemi et al. (2022), who demonstrate that infrastructure spending and better governance are significant to poverty reduction in Nigeria over the period 1996-2019 using ARDL.

In addition, focusing on the mediating role of governance in affecting the relationship between public spending and poverty, Masduki et al. (2022) use a Partial Least Squares Structural Equation Model (PLS-SEM) to conclude that quality government spending can reduce poverty and improve HDI in all underdeveloped areas on Java Island in Indonesia throughout the years 2010-2018. Two studies especially include interaction terms between social public spending and governance to assess their combined impact on poverty. Ben Mimoun & Raies (2022) use a panel of developing countries over the period 1980-2019 to assess the role of governance and political freedom in affecting the public spending impact on poverty. They estimate their model using Feasible Generalized Least Squares (FGLS) and GMM. Their results show that better quality of governance and freer political regimes lead to a stronger correlation of health and education public spending with poverty. Moreover, Komarudin (2022), using 2SLS and first-difference GMM, finds that

increasing public health spending leads to greater reduction in poverty in countries with higher governance levels across 24 developing countries for the years 2003-2016.

Decentralization is another country characteristic whose role in affecting social spending impact on poverty is studied. Litschig & Morrison (2013) use regression discontinuity analysis to investigate the impact of intergovernmental transfers at municipality level on education and poverty outcomes in Brazil from 1980 to 1991. They focus on education, transportation, housing, and urban infrastructure spending. They find that extra financing from central government leads to better education outcomes and lower poverty rates. In contrast, Elkhdari & Sarr (2018) show that more decentralized regions and those with high expenditure and revenue to GDP ratios are less efficient in reducing poverty, inequality, and vulnerability, while regions who raise their own revenues to finance their spending tend to be more efficient. They use non-parametric Data Envelopment Analysis for 16 regions and 1503 municipalities in Morocco over 2005-2009.

It is evident that existing studies show mixed evidence regarding the impact of different types of social public spending on poverty. These inconsistent findings can be attributed, in part, to the intricate tapestry of poverty itself. There is a myriad of poverty definitions, ranging from a simple lack of income to a multidimensional view encompassing access to health, education, and other essentials (Sen, 1995). Further muddying the waters, measures of poverty are quite diverse (Mckay, 2002), given the distinction between relative and absolute poverty, measured against national averages or certain subsistence levels (Foster, 1998). Determining these subsistence levels or poverty lines is inherently challenging as they vary considerably within a country especially between urban and rural areas, let alone across different contexts (Taylor & Lybbert, 2020). Adding another layer of complexity, international poverty lines set by the World Bank are subject to periodic revisions to reflect changes in the global economic conditions, making data for different time periods incomparable.

Further contributing to the inconclusive picture are the limitations of data accessibility in developing countries (Sasmal & Sasmal, 2016; Van de Walle, 1995) and the inherent difficulty of capturing the indirect and long-term effects of government spending. Finally, methodological choices employed by different studies, including the selection of controls, data types, econometric models, and estimation techniques, can also lead to diverse conclusions (Anderson et al., 2018). Given this range of factors influencing research outcomes, it is worth exploring whether

differences in development levels across countries might offer an additional explanation for the observed variability in findings.

In conclusion, the vast majority of research on the impact of public spending on poverty employs time-series or panel data analysis, with Fixed Effects Model (FEM) and Random Effects Model (REM) being the most used in panel analysis and Autoregressive Distributed Lag (ARDL) and Vector Error Correction Model (VECM) in the case of time-series analysis. Ordinary Least Squares (OLS), Two-Stage Least Squares (2SLS), Generalized Method of Moments (GMM) are the most common estimation techniques. Notably, the research landscape leans heavily towards single-country studies, which may delve into specific localities within that nation. Multi-country studies exist, but often restrict their focus to nations sharing similar development levels or regional contexts. Additionally, research on developed countries remains relatively limited. This varied methodological landscape and uneven geographic distribution, coupled with the mixed evidence regarding the effectiveness of different types of public spending in reducing poverty, leads to a crucial question: Could differences in development across countries offer a missing explanation for the observed discrepancies in research findings?

3. Analysis of the Interplay Between Social Public Spending and Poverty

This chapter aims to conduct a qualitative analysis of the correlation between social public spending and poverty across regions and development categories.

3.1. Pattern of Poverty and Social Public Spending

Figure 3 illustrates the correlation between social public spending and poverty in the sample dataset. Most data points in the right-hand side of the figure show that countries with high social public spending are clustered at low poverty rates. There are few outliers with relatively high poverty rates despite the high level of social spending. Conversely, in the left-hand side of the graph, poverty rates tend to be relatively higher with low social public spending. This suggests a negative relationship between social public spending and poverty. In other words, there is a tendency for high social public spending to be associated with low poverty rates and vice versa.

Figure 3. Social Spending (% of GDP) and Poverty Rate Scatterplot
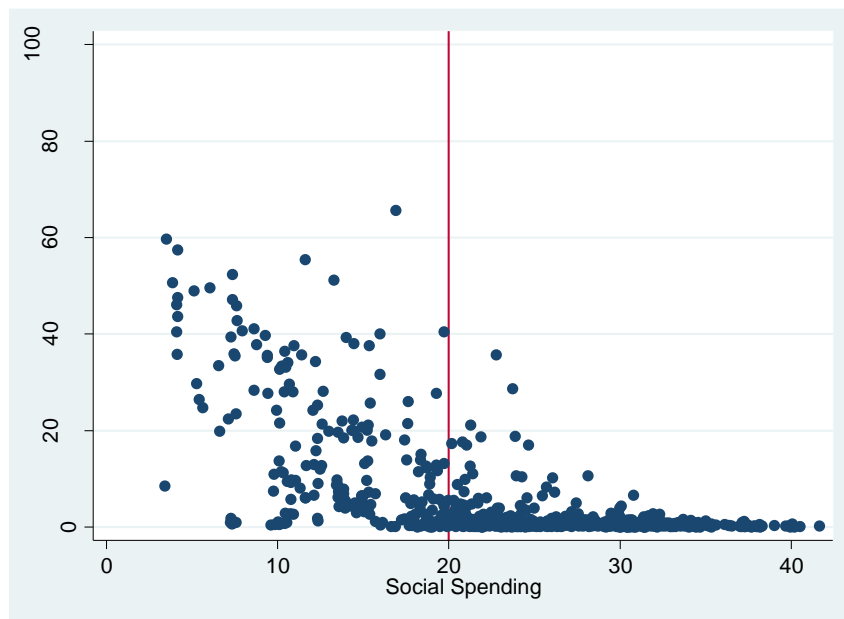
Source: Prepared by author, based on the World Bank's WDI and IMF GFS data

At the regional level, figure 4 shows that Africa has the highest average poverty rate, followed by Asia, America, and Europe over the period 1995-2021. Additionally, it reveals that Europe has the highest level of social public spending, followed by America, Asia, and Africa. These findings

align with the conclusion drawn from Figure 3, that suggests a negative correlation between social public spending and poverty rates. However, it is important to note that the differences in poverty rates between Asia and Africa, as well as America and Europe, are greater than the disparities in social public spending. This observation raises the possibility of regional variations in the effectiveness of social public spending in poverty reduction.
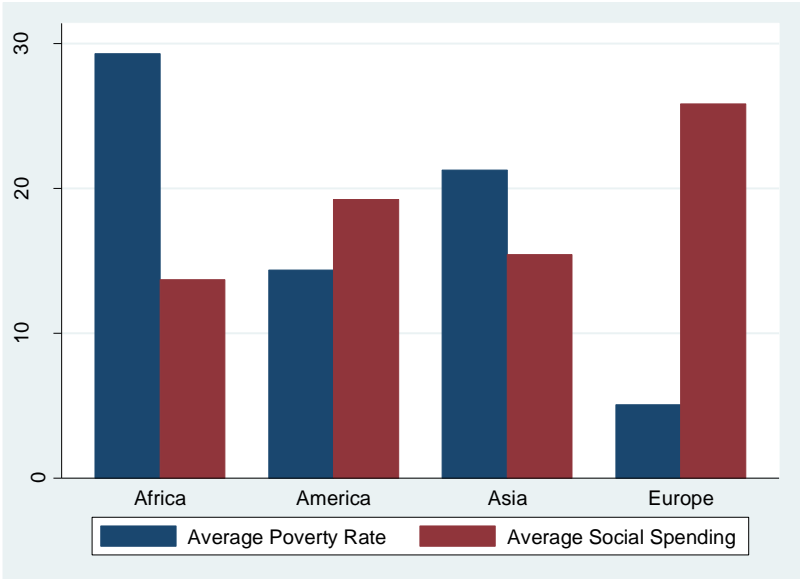
Figure 4. Average Poverty Rate and Social Spending (% of GDP) by Region

Source: Prepared by author, based on the World Bank's WDI and IMF GFS data

The state of development appears to be an effective mediator for translating social spending into poverty reduction. Figure 5 depicts the average social spending and average poverty rates, accounting for the state of development using the HDI indicator. It conforms with the conclusions drawn from Figures 3 and 4, affirming the negative correlation between social spending and poverty rates. The figure also demonstrates that countries with lower HDI levels tend to have lower average social public spending and higher average poverty rates. Conversely, countries with higher HDI levels exhibit higher average social spending and lower poverty rates. Notably, the disparity in poverty rates between lower and higher HDI countries surpasses the disparity in social public spending, highlighting the significance of a nation's development level in translating social spending into effective poverty reduction.

Figure 5. Average Poverty Rate and Social Spending (% of GDP) by HDI Level
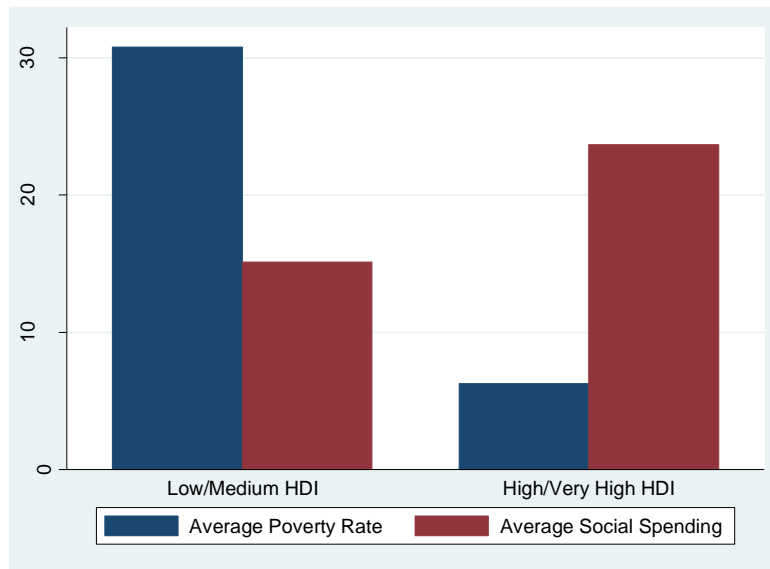
To further understand the role of HDI in strengthening the influence of social spending on poverty reduction, figure 6 displays the distribution of social spending categories (health, education, and social protection) by region. Social protection spending constitutes the largest share in social spending in all regions, with health spending taking precedence in Europe and America, and education spending taking precedence in Asia and Africa, on average over the studied period. Additionally, Europe has consistently the highest levels of social spending across all categories. On average, Europe's social protection spending significantly surpasses that of all other regions, followed by Asia, America, and Africa. Additionally, Europe's average health spending slightly exceeds that of America, with Asia and Africa following suit. Similarly, European education spending marginally surpasses that of Africa, followed by America and Asia.

Figure 6. Average Social Spending (% of GDP) by Category across Regions
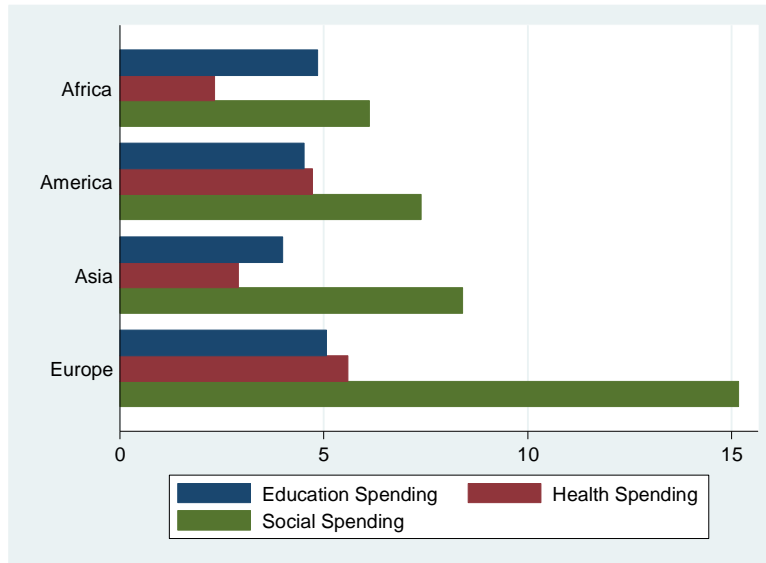
Source: Prepared by author, based on the IMF GFS data

Moreover, Figure 7 provides insights into the allocation of social public spending as percentage of GDP across different HDI levels. It reveals that countries with higher HDI levels allocate a greater proportion of their GDP to all types of social spending than lower HDI countries, although the magnitude of the difference varies with the type of spending. Notably, social protection spending exhibits a significant disparity, with higher HDI countries allocating substantially more resources to this area. In contrast, there is a relatively smaller gap in average health spending and only a slight difference in average education spending between lower and higher HDI countries.

In higher HDI countries, the majority of social spending is directed towards social protection, followed by health and education. The gap between social protection spending and the two other types of social spending is relatively wide in these countries. On the other hand, lower HDI countries primarily allocate their social spending to social protection, followed by education, and lastly health with relatively smaller gaps between the different types of spending.

Figure 7. Average Social Spending (% of GDP) by Category across HDI Levels

Note: Low HDI: < 0.55, Medium HDI: 0.55-0.699, High HDI: 0.7-0.799, Very High HDI: ≥ 0.8

3.2. Evolution of Poverty and Social Public Spending

Figure 8 (a and b) displays the trends in average poverty rates and average social public spending as percentage of GDP across regions over time in the dataset. Figure 8(a) indicates that Europe consistently exhibits the highest levels of social spending over the years, followed by America, Asia, and Africa. The spikes in social spending observed in America and Europe around 2010 might be attributed to the impact of the Great Recession during that period. Additionally, the overall increase in social spending across all regions around 2020 can be attributed to the global crisis caused by the COVID-19 pandemic.

Figure 8. Evolution of Average Poverty Rates and Social Spending (% of GDP) by Region

(a)   **(b)**
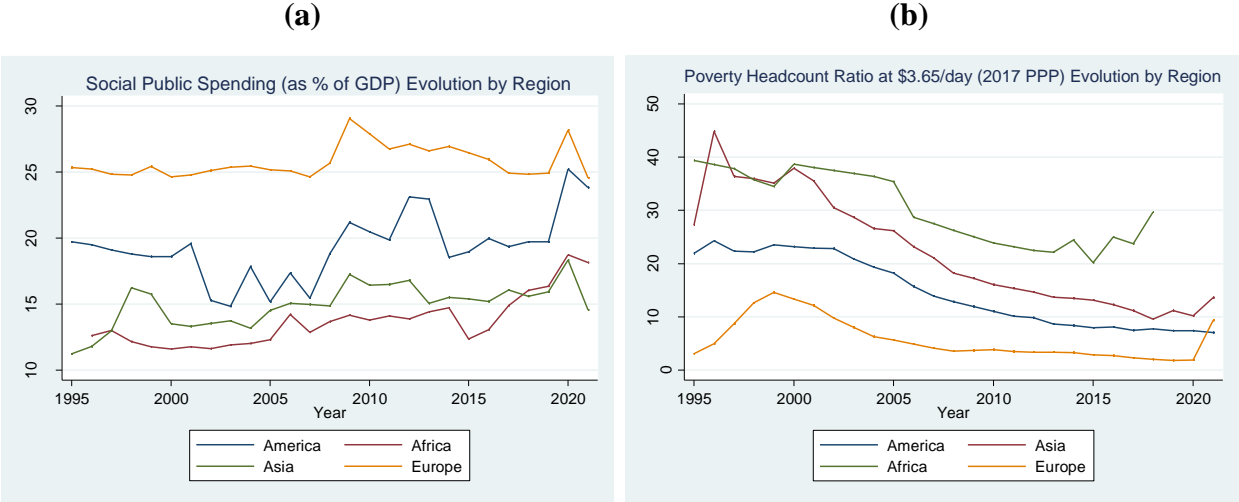
Source: Prepared by author, based on the World Bank's WDI and IMF GFS data.
Note: The Poverty Headcount Ratio data is interpolated.

Figure 8(b) highlights that Europe has consistently maintained the lowest poverty rates among regions in the dataset since the early 2000s following a spike, likely caused by worsening economic conditions in Western Europe (UNDESA, 2002). However, around 2020, there was a noticeable increase in the European poverty rates, surpassing those in America, which is likely attributed to the COVID-19 crisis. In contrast, America generally experiences higher poverty rates compared to Europe with a downward trend followed by relative stability, seemingly unaffected significantly by the pandemic. This suggests effective policies to mitigate the negative economic consequences of the COVID-19 crisis in the American region. Asia, while having relatively higher average poverty rates than America over the years, displays a downward trend interrupted in 2020, likely due to the pandemic. Lastly, Africa exhibits the highest poverty rates among all regions, with a general downward trend, although less steep and stable compared to other regions.

In summary, the patterns evident in average social spending and average poverty rates align with the conclusions drawn from preceding graphs. Across all regions, an increase in social spending correlates with either stable or decreased poverty rates. Notably, it is crucial to highlight a distinct trend emerging in Africa since 2015: despite a noticeable rise in average social spending, there is an absence of a corresponding decrease or stabilization in the average poverty rate.

Lastly, Figure 9 illustrates the trends in social public spending and poverty across countries with low/medium and high/very high HDI. It reinforces the observed correlation between a higher HDI and increased average social spending as a percentage of GDP, coupled with lower poverty rates. Notably, the figure reveals instances where the average social spending converges between lower and higher HDI countries, while no corresponding convergence in average poverty rates is observed. Instead, the rates appear to move in parallel, sustaining a consistent gap between the two groups.

Figure 9. Evolution of Average Poverty Rate and Social Spending (% of GDP) by HDI Level
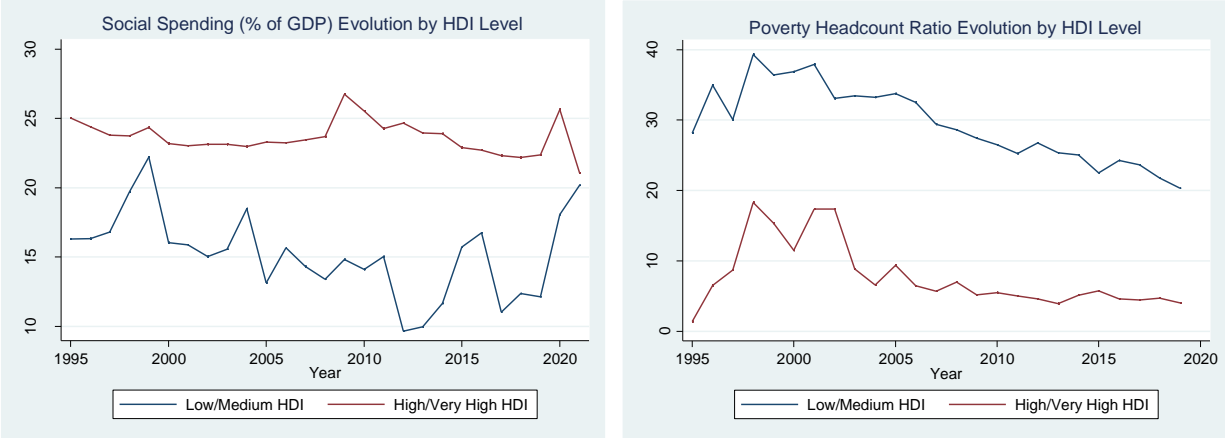
Source: Prepared by author, based on the World Bank's WDI and IMF GFS data
Note: Low HDI: < 0.55, Medium HDI: 0.55-0.699, High HDI: 0.7-0.799, Very High HDI: ≥ 0.8

In conclusion, both social public spending and development play crucial roles in reducing poverty, but their interaction may affect this relationship. While increased social public spending generally tends to correlate with lower poverty rates, the level of a nation's development seems to act as a critical mediator, influencing how effectively social public spending translates into poverty reduction.

4. Does the Development level matter? Empirical Model

4.1. Methodology

This study employs an empirical quantitative approach to investigate how the development level of countries, as measured by HDI, influences the relationship of social public spending and poverty. The used regression model is a panel data model, combining both cross-sectional (N) and time-series (T) dimensions. This allows for having a relatively more informative large database with more variability and less collinearity than cross-section and time-series (Baltagi & Song, 2006) and it allows for more degrees of freedom (Alamanda, 2020). The estimated model is specified as follows:

$$Pov = \beta_0 + \beta_1 Soc + \beta_2 HDI + \beta_3 (Soc * HDI) + \beta_4 \, logGDPC + \beta_5 \, Gini + \beta_6 Gov + \beta_7 Age + \in$$

Table 1   Summary of Variables

Variable	Description	Source	Units
Pov	Poverty Headcount Ratio at 3.65$/day (2017 PPP)	WB- WDI	%
Soc	Social Spending	IMF-COFOG	% of GDP
HDI	Human Development Index	UNDP-Latest HDI Dataset	Scale of 0 to 1
GDPC (log)	Real GDP per capita	WB- WDI	Constant 2015 USD
Gini	Gini Index	WB-WDI	Scale of 0 to 100
Gov	Governance Level	WB-WGI	Scale of -2.5 to 2.5
Age	Age Dependency Ratio	WB-WDI	%

Source: Prepared by author

This model is rooted in Keynesian economics, which suggests that increased social public spending boosts employment, income, and overall welfare, thereby reducing poverty (Pressman, 2014) in addition to the social investment theory, which advocates investing in human capital such as education, healthcare, and social protection to achieve positive socio-economic outcomes like lower poverty rates (Hemerijck, 2018). Moreover, the model draws on the poverty trap theory, which explores the role of development interventions in breaking poverty traps and creating opportunities for upward mobility (Sachs, 2005). The model follows the lines of Haile & Niño-Zarazúa, (2018) and Chong & Calderon (2000) and ensures the best fit of the model to the data.

The dependent variable of the model is the Poverty Headcount Ratio at $3.65 a day (2017 PPP), which is the percentage of the population living under the $3.65 income poverty line. Despite criticisms to relative poverty measures, the poverty headcount ratio is used because it is clear and simple (Asian Development Bank, 2012). The $3.65 international poverty line is used instead of national poverty lines for comparability reasons. Moreover, this poverty line is specifically chosen instead of the $2.15 poverty line as the used sample does not involve low-income countries due to lack of data. The sample includes lower-middle-, upper-middle-, and high-income countries according to the World Bank's latest country classification (World Bank Country and Lending Groups, 2024).[3]

The two main regressors are the social public spending as percentage of GDP and the Human Development Index (HDI). The social spending covers three types of pro poor spending, namely education, health, and social protection spending. Education spending is classified into pre-primary and primary education, secondary education, postsecondary nontertiary education, tertiary education, education not definable by level, subsidiary services to education, Research and Development (R&D) and education not classified elsewhere. Besides, health spending includes medical products, appliances, and equipment, outpatient services, hospital services, public health services, R&D, and health not classified elsewhere. As for social protection spending, it is directed towards old age, sickness and disability, unemployment, survivors, family and children, housing,

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[3] According to the latest updates of the World Bank's international poverty lines in September 2022, the $2.15, $3.65, and $6.85 poverty lines reflect poverty in low-income, lower-middle income, and higher-middle income countries, respectively (Jolliffe et al., 2022).

R&D, and social exclusion and protection not classified elsewhere. Social public spending is measured as a percent of GDP to reflect the size of the economy.

Developed by the United Nations Development Programme (UNDP) in 1990, the HDI stands as a more holistic measure of development than GDP. The HDI covers three main aspects of development, namely health, knowledge, and standard of living. The health aspect is reflected in the life expectancy at birth, the education aspect is quantified by the average schooling years for adults aged twenty-five years and more and expected schooling years for children at school starting age, and the standard of living is measured by the GNI per capita. The HDI takes values between 0 and 1. An HDI of less than 0.55 is considered low, less than 0.7 is considered medium, less than 0.8 is considered high, and an HDI of 0.8 or higher is classified as very high (UNDP Data Center, 2023). Although there is no single established convention for designation of developed and developing countries, the HDI is used as an indicator for the state of development due to its composite nature encompassing various aspects of development. Besides, it allows to capture the subtle differences in the state of development in different countries and in one country over time as it offers a wide spectrum of possible development levels instead of only categorizing countries into developed and developing.[4]

An interaction term for HDI with social public spending as percentage of GDP is used in the model to assess how the correlation between public spending and poverty rates varies with the stage of development.

In addition, a set of control variables is included in the model according to the literature. This set includes real GDP per capita (logged) (Haile & Niño-Zarazúa, 2018, Chong & Calderon, 2000), Gini index (Saha & Qin, 2023; Gutiérrez-Romero & Ahamed, 2021; Omar & Inaba, 2021; Chong & Calderon, 2000), age dependency ratio (Haile & Niño-Zarazúa, 2018; Kiendrebeogo et al, 2017; Sepulveda & Vazquez, 2011), and governance level (Ben Mimoun & Raies, 2021; Chong & Calderon, 2000).

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[4] The classification of countries by development level can be according to their income levels and it can be a sovereign decision of a state to identify itself as developed or developing.

The real GDP per capita (GDP per capita in constant 2015 USD) is included in the model since there is virtually a consensus in theory that the GDP level and growth rate affect poverty rates. We opt for the real GDP instead of nominal to account for inflation. In addition, the per capita GDP is used instead of total to reflect the population dimension. This indicator is expected to be negatively correlated with poverty. Moreover, since inclusive growth is not constantly achievable, the benefits of a high or growing GDP may not be equally distributed among the population. Therefore, the Gini index should be incorporated into the model. The Gini index measures the degree of inequality in income distribution in a country and it is measured on a scale of 0 to 100, where higher values imply greater inequality. So, it is expected to be positively correlated with poverty. Many studies also show that governance plays an important role in the distribution of resources among the members of the society as for example high corruption rates can lead to the misuse of public resources, deterring them from reaching the most vulnerable. Therefore, the governance level is included as control. A governance index was constructed using Principal Component Analysis, showing a negative significant correlation with poverty. Yet, the unweighted average is ultimately preferred for simplicity. The governance level is hence an average of six indicators: government effectiveness, corruption control, rule of law, political stability and absence of violence, voice and accountability, and regulatory quality. This indicator is measured on a scale of -2.5 to 2.5, where higher values reflect better governance. Hence, it is expected to be negatively correlated with poverty. In addition, the age dependency ratio is added to measure the number of dependents (people younger than 15 or older than 64) relative to the working-age population (people aged 15-64) as countries with high age dependency ratio are expected to have higher poverty rates.

Data

The study uses unbalanced panel data for 68 countries at different development stages over 27 years (1995-2021).[5] Countries in the sample are selected to represent different regions and stages of development (Table 1). The study was intended to include data starting 1990, which marks the beginning of Structural Adjustment Programs (SAPs) in many countries with poverty reduction as one of the aims (yet under austerity conditions). However, the lack of adequate data on poverty

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[5] The poverty headcount ratio for countries with short data gaps (Albania, Australia, Chile, China, Colombia, India, Iran, Philippines, and Malaysia) is interpolated to improve the balance of the data.

before 1995 constrained the timeframe to start in 1995. It is worth noting that poverty data is not published on a yearly basis for all countries, resulting in an unbalanced panel data model.

Data for the poverty headcount ratio, real GDP per capita, Gini index, and age dependency are extracted from the World Development Indicators (WDI) of the World Bank. Data for education, health and social protection spending as percent of GDP are taken from the Expenditure by Government Function (COFOG) tables of the IMF Government Finance Statistics (GFS). Governance indicators are obtained from the Worldwide Governance Indicators (WGI) database of the World Bank. Finally, HDI data is collected from the UNDP Data Center.

Table 2 Summary of Countries by Region

Europe		America		Asia		Africa
Albania	Denmark	Argentina	El Salvador	China	Malaysia	Egypt
Armenia	Estonia	Bolivia	Honduras	India	Mongolia	Ivory Coast
Belarus	France	Brazil	Mexico	Indonesia	Philippines	Morocco
Austria	Georgia	Canada	Peru	Iran	Serbia	Tunisia
Belgium	Germany	Chile	Panama	Japan	Thailand	Mauritius
Bulgaria	Greece	Colombia	Paraguay	Jordan	Turkey	South Africa
Croatia	Hungary	Costa Rica	Uruguay	Kazakhstan	Russia	
Cyprus	Iceland	Ecuador		Kyrgyzstan		
Ireland	Portugal					
Italy	Romania					
Kosovo	Slovakia					
Latvia	Spain					
Lithuania	Sweden					
Moldova	Ukraine					
Netherlands	United Kingdom					
Poland						

Source: Prepared by author based on the United Nations Standard Country or Area Codes for Statistical Use

4.2. Model Estimation

First, data is tested for multicollinearity using collinearity diagnostics and pairwise correlation matrix (Tables 2 and 3 in Appendix). Both show no multicollinearity between the model variables, except for the social spending and its interaction with the HDI. It is normal, however, to find such multicollinearity between the main predictor and the cross product (Shieh, 2010; Balli & Sørensen, 2010; McClelland et al., 2017; Disatnik & Sivan, 2016).

Stationarity is tested using the Fisher Augmented Dickey-Fuller test. The poverty headcount ratio, HDI, governance, age dependency, and Gini Index turn out stationary. However, the results for social expenditure as percent of GDP and real GDP per capita reveal non-stationarity. So, their first differences are tested for unit root, and they prove stationary. Thus, the social expenditure as percent of GDP and real GDP per capita are used in first differences to ensure stationarity.

Past literature sheds light on potential endogeneity of social spending in models where the poverty rate is the dependent variable, mainly due to reverse causality. We also presume potential endogeneity of the HDI and GDP per capita due to the same reason (Priambodo, 2021 and Arimah, 2004). Therefore, the Two-stage Least Squares (2SLS) is used to estimate the model to address potential endogeneity. The 2SLS is an instrumental variable estimation method, which involves two stages. In the first stage, a reduced form equation, composed of a linear projection of the endogenous variable onto all exogenous variables, is estimated by OLS. Then in the second stage, the reduced form equation is plugged into the main model equation (Wooldridge, 2010). We employ fixed effects to control for unobserved country-specific attributes which are constant over time. We also use clustered standard errors to account for heteroscedasticity and autocorrelation. Furthermore, we carry out robustness checks by using different methods of estimation, namely the Instrumental Variable Generalized Method of Moments (IV/GMM) and the Limited Information Maximum Likelihood (LIML). The model is estimated using Stata package.

At first, we used the lagged social spending, share of agriculture in GDP and log of population as instruments for social spending, according to the literature (Haile & Niño-Zarazúa, 2018 and Gebregziabher & Niño-Zarazúa, 2014) and we used lagged values of HDI and GDP per capita as instruments for HDI and GDP per capita (Barros et al., 2019; Dolakhia, 2003; Alvi & Senbeta, 2012) to run the regression.

Endogeneity was then tested using both the David-Mackinnon test of exogeneity and the C-test, defined as the difference of two Sargan-Hansen statistics, one for the equation where the suspect regressor is treated as endogenous and one for the equation where the suspect regressors are treated as exogenous. The results of the endogeneity tests showed that HDI is endogenous as presumed, while the GDP per capita and social spending proved exogenous. According to the C-test, the null hypothesis that HDI can be treated as exogenous is rejected at the 5% significance level with a p-value of 0.014. Nonetheless, we fail to reject the null hypothesis that social spending can be treated as exogenous at the 5% significance level with a p-value of 0.120. We also fail to reject the null hypothesis of exogeneity of the GDP per capita at the 5% significance level with a p-value of 0.378. This means that social spending and GDP per capita are not endogenous in the model. Thus, HDI is considered the only endogenous variable and hence HDI lagged values are used as an instrument to address this endogeneity. The model results are presented and discussed in Chapter 5.

4.3. Model Limitations

The lack of quality data for poverty rates and/or social spending in low HDI countries restricted the inclusion of many of them. Moreover, it would have been insightful to include a multidimensional poverty measure. However, the available multidimensional poverty measure is mainly the Human Poverty Index (HPI), which is replaced by the Multidimensional Poverty Index (MPI) in 2010 (Alkire et al., 2016). The HPI data is no longer available and the MPI data is not sufficient to run regression. Also, the HDI is deemed as the best available option to measure development since it is a multidimensional index which reflects the various aspects of development of nations and hence is superior to using income level in addition to allowing the assessment of the variability of the development level across time for one country and hence is superior to using a development dummy for each country. Nonetheless, it does not convey the real degree of development for all countries. For example, although countries like Mexico and Egypt are classified as developing by the United Nations Department of Economic and Social Affairs (UNDESA) in the World Economic Situation and Prospects (WESP) report (UNDESA, 2022), they have relatively high HDI levels of 0.76 and 0.73 in 2021.

5. Social Spending, Development, and Poverty: Empirical Results

In this chapter, the results of the fixed effects 2SLS regression are presented and discussed. Then, robustness checks are applied to test the validity of our conclusions. The robustness checks include running the regression using different estimation techniques, namely Instrumental Variable Generalized Method of Moments (IV/GMM) and Limited Information Maximum Likelihood (LIML).

5.1. Two-Stage Least Squares Results

Table 3   Reduced Equation Results of the 2SLS Estimation

Independent Variables	HDI
Lagged HDI	0.939***
	(0.0112)
Social Spending	-0.00156
	(0.00204)
GDP per Capita (log)	8.43e-06
	(0.000372)
Social Spending*HDI	0.00137
	(0.00259)
Gini Index	6.89e-06
	(0.000158)
Governance	-0.00153
	(0.00190)
Age Dependency	1.30e-07
	(0.000106)
Constant	0.0560***
	(0.0116)
Observations	496
Number of Countries	46
R-squared	0.954

Source: Author's Estimates

Note: (i) Significance level ***p<0.01 **p<0.05 *p<0.1 (ii) Robust standard errors in parentheses. (iii) Standard errors are clustered by country. (iv) Social Spending and logged GDP per capita are in first differences. (v) The regression includes fixed effects.

Table 4 2SLS Estimates of Social Spending and Development Relationship with Poverty

Dependent variable: Poverty Headcount Ratio at $3.65/day (2017 PPP)

Independent variables	2SLS
HDI	-121.8***
	(25.83)
Social Spending	7.490***
	(2.862)
Social Spending*HDI	-9.324***
	(3.572)
GDP per Capita (log)	-0.633**
	(0.301)
Gini Index	0.599**
	(0.234)
Age Dependency	0.554***
	(0.185)
Governance	-7.574***
	(2.462)
Observations	496
Number of Countries	46
R-squared	0.545

Source: Author's Estimates

Note: (i) Significance level***p<0.01 **p<0.05 *p<0.1. (ii) Robust standard errors in parentheses. (iii) Standard errors are clustered by country. (iv) Social Spending and logged GDP per capita are in first differences. (v) The regression includes fixed effects. (vi) Kleibergen-Paap rk LM statistic p-value=0.00. Kleibergen-Paap rk Wald F statistic = 4740.403. Stock-Yogo weak ID test critical values: 10% maximal IV size = 16.38.

To check the validity of the used instrument, the first stage statistics are explored. The first stage results in Table 3 show a strong significant correlation between the endogenous variable (HDI) and the used instrument (lagged HDI). Also, a high value for the first-stage F-statistic is found. The Anderson-Rubin Wald and Stock-Wright LM tests also reject their null hypotheses indicating that the endogenous regressors are relevent. Moreover, underidentification is tested using the Kleibergen-Paap rk LM statistic. The p-value of the test is less than 0.05, which means that the null hypothesis that the model is underidentified can be rejected at the 5% significance level. Thus, the used instrument is relevant to the endogenous regressor. In addition, weak identification is checked using the Kleibergen-Paap rk Wald F statistic, which is typically used instead of the

Cragg-Donald statistic in robust and clustered models. This statistic considerably exceeds the Stock-Yogo critical values showing that the instrument strongly correlates with the endogenous regressor.

Table 4 presents the empirical findings of the 2SLS regression on the correlation of social spending as percentage of GDP and poverty at different HDI levels. The used controls are significant and have the expected signs. The results show that the HDI is negatively correlated to poverty, as hypothesized, at all levels of social spending. Moreover, the correlation of HDI and poverty becomes more negative as the social spending as percentage of GDP increases, given the significant negative interaction of social spending and HDI. Likewise, the social spending correlation with poverty varies according to the HDI level. This is evident in the equation for the marginal effect of social spending on poverty, which shows that the marginal effect depends on the HDI. Given the significant interaction, the marginal effect of social spending on poverty would be claculated as 7.490-9.324*HDI (Wooldridge, 2010). Also, the negative sign of the interaction implies that the social spending is more negatively correlated to poverty at higher HDI levels.

Figure 10 illustrates the different predicted slopes for the marginal effects of social spending on poverty rates at the lowest, average and highest HDI values in the sample used in the 2SLS estimation. At the lowest HDI, the slope appears to be positive, which implies a positive correlation between social spending and poverty at such a low level of development. Then, the slope is slightly negative at the average HDI, showing a moderate negative correlation between social spending and poverty. However, the slope is steeper at the highest HDI, indicating a more negative correlation between social spending and poverty. At the highest HDI value, the poverty rate is reduced by 1.37 percent following a one percentage point increase in social spending.

Figure 10   Social Spending Marginal Effects on Poverty at Different HDI Levels
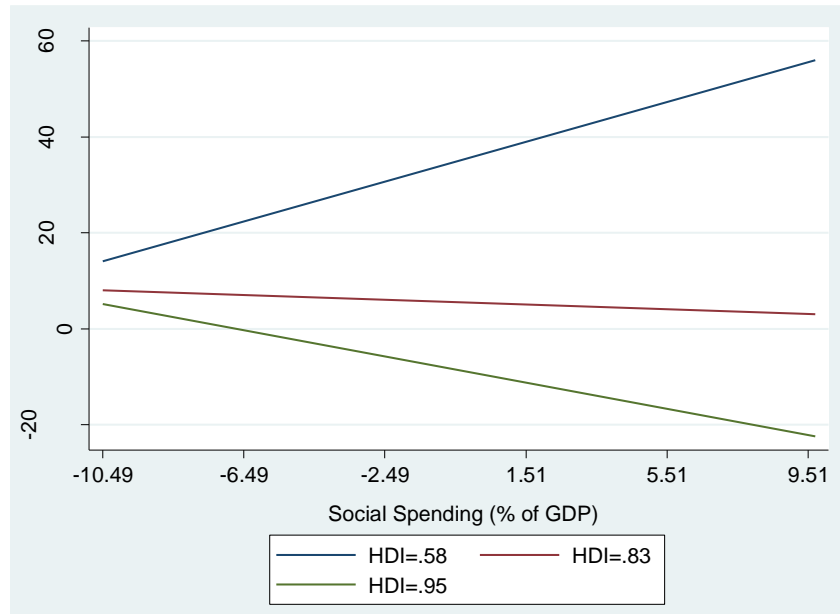
Source: Prepared by author based on the 2SLS regression results

There are several reasons which can possibly explain the relatively ineffective social spending to reduce poverty at low levels of development. First, the application of universal subsidies instead of targeted programs in some developing countries results in an inefficient use of government resources and defintely high rates of spending which are not reflected in lower poverty rates (Fan et al., 2006). Furthermore, the lack of technology to use big data and deal with large databases collection and analytics makes efficient targeting of the poor even more challenging and costly, leading to leakage of resources to the non poor (Besley and Coate, 1992).

Moreover, behavioral responses to social spending may render it ineffective. For example, people who already have jobs might claim unemployment benefits due to the widespread informal labor in developing countries. Besides, poor people might have a disincentive to work if they are already receiving unemployment benefits or food vouchers (Besley and Coate, 1992). In addition, a high spending on education may be coupled with high school drop-out rates or reluctance of poor people to send their children to public schools altogether, given the high rates of child labor among the poor at low levels of development (Boyle et al., 2002; Datzberger, 2018). That said, the quality of public education in less developed countries might itself be inadequate to assist the poor in escaping poverty (Datzberger, 2018). Finally, poor people in less developed countries may have inadequate health awareness and hence may not benefit ideally from social spending on public

hospitals or subsidized medications. Again, the probable low quality of public healthcare in countries of low development, whether in terms of infrastructure or workforce, in addition to the long wait times can also contribute to the inability of the poor to reap the benefits of public health spending (Pitt et al., 1993). Finally, the likely higher rates of corruption in less developed countries can hinder the benefits of social spending from reaching those in need (Datzberger, 2018; Kwon & Kim, 2014).

In addition, there is evidence that government spending multiplier effects in developing countries are lower than in developed ones (Ilzetzki et al., 2013; Kraay, 2014; IMF, 2020). This means that the overall positive repercussions of public spending on the economy are less pronounced in the developing countries compared to the developed. Government spending multiplier might be reduced by the high public debt levels (Ilzetzki et al., 2013), which is probably the case in developing countries. Moreover, poor targeting may imply lower multiplier effects in developing countries given that targeted fiscal measures have greater output multipliers (IMF, 2020).

All the above reasons demonstrate why social spending may never translate into poverty reduction with low development. The even positive realtionship between social spending and poverty at the lower HDI levels can also be explained by the crowding out of private transfers. Nikolov & Bonci (2020) reveal that the vast majority of studies examining the crowding out effects in developing countries find a displacement of informal mechanisms of financial support by public spending. They also suggest that crowding out effects are likely to be dissimilar in developing and developed countries due to differences in the strength of family ties, tradition of familial devotion, size and duration of social program benefits, and history of their introduction.

5.2. Robustness Checks

To test the validity of our results, the regression is run using different estimation methods. The model is estimated using IV/GMM and LIML with fixed effects and the results are compared to the original model.

Table 5   Robustness Checks

Dependent variable: Poverty Headcount Ratio at $3.65/day (2017 PPP)

Independent Variables	(1) IV/GMM	(2) LIML
HDI	-121.8***	-121.8***
	(25.83)	(25.83)
Social Spending	7.490***	7.490***
	(2.862)	(2.862)
Social Spending*HDI	-9.324***	-9.324***
	(3.572)	(3.572)
GDP per Capita (log)	-0.633**	-0.633**
	(0.301)	(0.301)
Gini Index	0.599**	0.599**
	(0.234)	(0.234)
Age Dependency	0.554***	0.554***
	(0.185)	(0.185)
Governance	-7.574***	-7.574***
	(2.462)	(2.462)
Observations	496	496
R-squared	0.545	0.545
Number of Countries	46	46

Source: Author's Estimates.

Note: (i) Each column represents an individual regression. (ii) Significance level ***p<0.01 **p<0.05 *p<0.1 (iii) Robust standard errors in parentheses. (iv) Standard errors are clustered by country. (v) Social Spending and logged GDP per capita are in first differences. (vi) All regressions include fixed effects. (vii) Kleibergen-Paap rk LM statistic p-value=0.00. Kleibergen-Paap rk Wald F statistic = 4740.403. Stock-Yogo weak ID test critical values: 10% maximal IV size = 16.38.

Table 5 shows that the results of the models estimated by both IV/GMM and LIML are similar to those obtained when using 2SLS in signs and significance, which means that the model is robust to different estimation methods.

The model results are notably in line with findings of studies on developed countries showing a negative correlation between social public spending and poverty such as Kenworthy (1999) and Cammeraat (2020), who reveal a negative relationship in a cross-section of industrialized nations.

This is also confirmed by Jung et al. (2015), studying the relationship at the national level in the United States. The results also comparatively align with studies on developing countries showing insignificant social spending such as Osundina (2014) and Omari & Muturi (2016), who reveal the insignificance of education spending to poverty reduction in Nigeria and Kenya, respectively. Osundina (2014) further reveals insignificant health spending in Nigeria. Moreover, Taruno (2019) and Alamanda (2020) show an insignificant social protection spending in Indonesia, while Taruno (2019) also finds an insignificant education spending in urban areas in Indonesia.

6. Conclusion

Although the impact of social public spending on poverty is heavily studied in economic literature, the relevant cross-national studies, especially those involving countries at different stages of development, are relatively few. In addition, there is a rather limited number of attempts to study the role of country characteristics in affecting this relationship despite the inconclusive evidence regarding its significance and direction. Also, to our knowledge, there are no attempts to assess the moderating effect of development.

Accordingly, this research evaluates the effect of development on the correlation between social public spending and poverty. A panel of 68 countries in different regions and at varied stages of development over the period 1995-2021 is employed to estimate a Fixed Effects Model using Two-Stage Least Squares (2SLS). Besides, the model is estimated using Instrumental Variable Generalized Method of Moments (IV/GMM) and Limited Information Maximum Likelihood (LIML) for robustness checks.

Our findings reveal that a higher HDI implies a more intensified negative relationship between social public spending and poverty. At the higher HDI levels, the poverty rate decreases as social public spending increases. However, the poverty rate increases with social public spending at lower HDI levels. On the other hand, the poverty rate decreases as the HDI level increases for all levels of social public spending. Nonetheless, the impact of the HDI level on the poverty rate is also boosted by higher levels of social public spending. The results are robust to the estimation method.

These findings suggest important policy implications, especially for developing countries. First, applying appropriate targeting techniques and avoiding global subsidies can help in improving the effectiveness of social public spending by preventing leakage of resources to the non-poor. Moreover, working on enhancing governance and controlling corruption would also ensure that the social expenditures reach the targeted poor. Furthermore, improving the quality of health and education services would make them more useable and useful to the poor, all while raising awareness about the importance of good health and education among the underprivileged classes of society. Finally, it is primordial for governments to invest in orchestrating the efforts of poverty alleviation to avoid crowding out private spending on poverty.

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The research also sheds light on the need for better quality data for the poverty headcount ratio and social spending, especially in developing countries in addition to data on multidimensional poverty. Moreover, the availability of a development measure which reflects more of the development aspects in a country would allow more accurate depiction of the real state of development in different countries.

Future studies should explore the effect of development on the link of social spending with variables reflecting multidimensional poverty such as nutrition, sanitation, and education attainment in addition to rural-urban and gender inequality. It would also be interesting to include different kinds of public spending like infrastructure or agriculture spending. Besides, examining the potential role of regional effects and other country characteristics such as public indebtedness, inequality, and major sources of government finance in influencing the social spending effect on poverty can be equally insightful. Finally, investigating the causes of the apparent ineffectiveness of social public spending in developing countries through field research and surveys would complement the empirical research.

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Appendix

Table 1:   Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Poverty Rate	496	5.245	10.416	0	65.6
Social Spending	496	-.121	1.244	-10.49	9.7
HDI	496	.833	.08	.58	.95
GDP per Capita (log)	496	5.933	1.067	-.041	9.366
Gini Index	496	33.482	5.685	23.2	64.8
Governance	496	.624	.829	-1.04	1.88
Age Dependency	496	49.317	5.718	37.12	72.49

Source: Stata

Note: Social Spending and logged GDP per capita are in first differences

Table 2: Collinearity Diagnostics

(obs=496)

Variable	VIF	SQRT VIF	Tolerance	R-Squared
Social spending	83.48	9.14	0.012	0.988
HDI	2.81	1.67	0.356	0.644
GDP per Capita (log)	1.93	1.39	0.5188	0.481
Social spending*HDI	84.47	9.19	0.012	0.988
Gini Index	1.25	1.12	0.800	0.200
Governance	3.39	1.84	0.295	0.705
Age Dependency	1.25	1.12	0.797	0.203

Source: Stata

Note: Social Spending and logged GDP per capita are in first differences

Table 3: Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Social spending	1.000						
(2) HDI	-0.133	1.000					
	(0.003)						
(3) GDP per Capita (log)	-0.268	0.515	1.000				
	(0.000)	(0.000)					
(4) Social spending*HDI	0.994	-0.133	-0.283	1.000			
	(0.000)	(0.003)	(0.000)				
(5) Gini Index	0.071	-0.306	-0.095	0.078	1.000		
	(0.113)	(0.000)	(0.035)	(0.083)			
(6) Governance	-0.102	0.780	0.593	-0.110	-0.267	1.000	
	(0.023)	(0.000)	(0.000)	(0.014)	(0.000)		
(7) Age Dependency	-0.025	0.186	-0.004	-0.036	0.115	0.289	1.000
	(0.579)	(0.000)	(0.928)	(0.426)	(0.010)	(0.000)	

Source: Stata

Note: Social Spending and logged GDP per capita are in first differences