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Social spending as a development tool: evidence from developing countries

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Abstract. In this paper, we aim to study the interrelationship between social spending, economic growth, and income inequality in developing countries from the year 1990 to 2013. We observed that all the categories of social spending produced a significant reduction in income inequality. Further, the impact of health and education spending on economic growth is significant, and that of social protection is insignificant. This indicates that both health and education spending can break the trade-off between equity and efficiency, that is, it can lead to both growth and progressive distributional change. However, given the importance of social welfare measures in reducing income inequality, developing countries need to focus on active social spending like labor market reforms that can increase gross domestic product growth rate and simultaneously reduce income inequality.

Keywords. social spending; income inequality; GDP growth; simultaneous equation model; Asia-Pacific countries

JEL Codes. C33, D30, H51, H52, O40

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1. Introduction

The increase in income inequality in recent years has drawn considerable attention from academic and policy experts on the relationship between economic growth and income inequality in both developed and developing countries. Economic growth and income inequality, being endogenous outcomes of the economic system, are subject to common influences, with respect to both structural changes and macroeconomic policies. Structural changes such as improvement in technology facilitate economic development, which is the underlying assumption of Kuznet's curve, and may result in economic inequality. However, macroeconomic policies, particularly fiscal policies are considered an important instrument for achieving goals in terms of equity and efficiency (Musgrave, 1959).

This paper focuses on the expenditure side of the budget and emphasizes the role of social spending in explaining the dynamics between growth and inequality¹. Government spending in the social sector received an impetus with the emergence of endogenous growth theory (Lucas, 1988; Romer, 1994), which largely focused on enhancing human capital development. Such policies facilitate the process of innovation, research, knowledge creation, and information

¹ In this study, social spending refers to government expenditure on education, health, and social protection.

dissemination and reduce vulnerability to external shocks (Gebregziabher & Niño-zarazúa, 2014). Thus, the government expenditure in the social sector is found to have a positive impact on long-term economic growth and development (Benhabib & Spiegel, 1994). In addition, such policies play an important role in poverty and inequality reduction (Fiszbein et al., 2014). Indeed, the Millennium Development Goals that bring poverty reduction, equity, and risk management to the forefront of debates further drew the attention of policymakers and development agencies toward establishing a strong social welfare system, particularly for the poorest and most vulnerable section of the society (Baldacci et al., 2008).

Despite its relevance, few studies have attempted to explore the relationship between income inequality, economic growth, and government spending in the social sector². Most of the empirical studies have analyzed either the impact of government spending in the social sector on economic growth (Antonia Afonso & Alegre, 2011; António Afonso & Furceri, 2010; Folster & Henrekson, 2001) or its role in poverty and income inequality reduction (Cubero & Vladkova, 2010; Foster, 2012; Ospina, 2010; Rudra, 2004). Further, these studies have not considered the role of gross income inequality in determining the impact of government spending on social spending and how such an impact influences the relationship between economic growth and net income inequality. While gross income inequality is pre-tax and government transfers' income inequality, net income inequality is post-tax and government transfers' income inequality.

Thus, our aim was to study the role of social spending in determining the relationship between economic growth and inequality. First, we analyzed the impact of gross income inequality and other political and economic factors on social spending. Second, we examined which categories of social spending (education, health, and social protection) are effective in reducing income inequality and the effects of these policies on economic growth.

The remainder of this paper is structured as follows: Section 2 provides a brief summary of our literature review, which deals with income inequality, economic growth, and government spending in the social sector. Section 3 describes the database and empirical methodology. Section 4 delineates the findings and results. Section 5 gives the discussion and policy implications. Section 6 provides the concluding remarks.

2. Literature Review

Since the seminal work of Kuznets (1955), the relationship between economic growth and income inequality has drawn a great deal of attention among the academia and policy circles. Kuznets established an inverted-U shaped relationship between economic growth and income inequality. He argued that as an economy develops, its structure shifts from the agricultural to the industrial sector, and increases the income of few people. This thus increases the level of inequality. Therefore, at the early stages of economic development, there is a positive relationship between economic growth and income inequality. However, at the later stages, inequality diminishes. This

² Arjona et al. (2003) examined the income distribution and social expenditure effects on economic growth.

indicates a negative relationship between economic growth and inequality. Kuznets hypothesis thus implies that redistributive policies have negligible effects on development.

Till the 1970s, most of the OECD (Organization for Economic Cooperation and Development) countries experienced a downward trend in income inequality. This provides evidence of Kuznets hypothesis, where a virtuous circle seems to appear: lower inequality fosters economic growth, which in turn lowers the inequality level (Aghion et al., 1999). However, during the twentieth century, the developed world experienced a sharp increase in inequalities (Gottschalk & Smeeding, 1997). This thereby challenged the traditional theory on the economic history perspective proposed by Kuznets. As a result, new theories of economic growth evolved during the 1990s to shed light on the effect of growth on income inequality. These theories focused on three new phenomena: (1) trade liberalization, (2) technical change, and (3) the emergence of new organizational forms that were the key components of the growth process (Aghion et al., 1999). These factors have widened the income disparity, which in turn has revived the importance of fiscal policy as a redistributive tool to mitigate the negative impact of the growth process in terms of income inequality.

With the development of endogenous growth theory, the 1990s have witnessed a resurgence of interest in the determinants of economic growth. There is vast literature related to this, and several studies have examined the impact of inequality on economic growth. One strand of the literature focuses on the pro-growth effects of inequality (Forbes, 2000; Frank, 2009). Forbes (2000) provided evidence of a positive relationship between inequality and economic growth in a large number of countries. Similarly, Frank (2009) showed a positive inequality-growth relationship that is driven principally by the concentration of income in the upper end of the income distribution across the United States. Such a relationship exists because of a) the marginal propensity of the rich to save is greater than that of the poor (Kaldor, 1955; Lewis, 1954) and b) incentive considerations (Mirrlees, 1971).

Another strand of the literature proposed alternative channels of interaction between income inequality and economic growth, and produced a negative relationship between the two variables (Alesina & Perotti, 1996; Alesina & Rodrik, 1994; Persson & Tabellini, 1994). The channels through which inequality may be harmful to growth include a) Political-economy arguments and b) capital market imperfections. Persson and Tabellini (1994) reported that past inequality is negatively related to the current growth rate of per capita income. They used ordinary least square regressions over a cross-section of nations and offered a political explanation for their result. Similarly, Alesina and Perotti (1996) identified the political channel through which income inequality harms growth. They suggested that an increase in inequality results in socio-political instability, which causes an uncertain political environment. This, in turn, has a negative effect on investment and consequently reduces growth. Based on regression analysis, Cubero and Vladkova (2010) provided evidence of a negative relationship between income inequality and economic growth in the transition economies of Central and Eastern Europe and the Commonwealth of Independent States. Thus, these studies contradict the conventional textbook approach that suggests inequality generates incentives and therefore accelerates growth. Thus,

the extant literature on the relationship between economic growth and income inequality gives mixed results.

Further, economic growth and income inequality are considered as endogenous outcomes of economic systems. They are influenced by common factors such as structural changes and macroeconomic policies to which both indicators respond simultaneously. However, policy interventions by the government may lead to a loss of economic efficiency that Okun (1975) described as the “big trade-off” and used the metaphor “the leaky bucket” to explain this. He argued that government policies, including taxes and transfers, contribute to an equal distribution of income, but this comes at the cost of economic growth. Several papers point out that there are some categories of government expenditure that may promote growth and reduce income inequality. Other categories may however imply standard equity-efficiency trade-offs that preoccupied Okun's law (Benabou, 2000; Lopez, 2003; Saint-Paul & Verdier, 1993; Seshadri & Yuki, 2004). Using the dynamic general equilibrium model, Seshadri and Yuki (2004) showed that redistributive policies, that is, money transfers and educational transfers, result in very large gains in output, but this occurs at the cost of equity. However, within the class of redistributive policies, educational transfers increase economic growth and simultaneously promote equality. Sala and Roca-Sagalés (2011) confirmed the standard equity-efficiency hypothesis which states that current government spending produces non-Keynesian effects and has a large negative impact on inequality. However, public investment in infrastructure promotes economic growth and reduces income inequality. As far as taxes are concerned, both direct and indirect taxes generate a positive impact on economic growth. Although there is no evidence of an equity-efficiency trade-off regarding direct taxes, indirect taxes increase inequality. Further, Lopez (2003) found that improvements in education, infrastructure, and lower inflation levels lead to both growth and progressive distributional change. Turnovsky (2015) focused on the role of public investment in determining the dynamics of economic growth and income inequality. Two alternative frameworks that were used however gave contrasting results. In the first framework, that is, “representative consumer theory of distribution,” public investment in infrastructure tends to enhance productivity of private capital, and stimulate growth but private capital being more unequally distributed than labor tends to increase inequality. In the second framework, “idiosyncratic productivity shocks,” the degree of income inequality is determined by productivity shocks, which in turn determines growth rate, and implies a negative growth-inequality relationship exists. Thus, the extant literature on growth-inequality relationship provides conflicting evidence, which thereby emphasizes the role of fiscal policy as a redistributive tool and as an instrument for promoting economic growth.

This paper exclusively focuses on the role of government expenditure in the social sector (education, health, and social security) as a mechanism for determining the relationship between inequality and economic growth. Public social expenditure as a source of economic growth has been widely debated in both the developing and developed world. In recent years, several emerging market economies such as Indonesia, Thailand, and India have undertaken extensive social protection programs that have contributed to economic growth. Several developed

countries including Greece, Italy, and France however have reduced their social spending after the 2008 crisis as an austerity measure. However, with these diverse policies, both emerging and developed economies have seen an increase in income inequality. This raises the important question of the relationship between public social expenditure aimed at reducing economic inequality and its impact on economic growth.

2.1 Social Spending, Economic Growth, and Income Inequality

Economists have emphasized the principle that there is “no Free Lunch,” which implies that *even if something appears to be free, there is always a cost to the individual or to society as a whole*³. The concept has been applied to the issue of social spending. It was contended by the economists that social spending in the form of health insurance, social welfare programs, and old-age pensions often comes at the cost of economic growth. Such spending causes distortions in economic activity because of the disincentives embedded in the structure of welfare spending. Lindert (2004) opined that such interventions could nevertheless cause economic externalities that can offset their potential distortions. Further, he stated that social spending often positively influences GDP, even if the effects of the taxes that financed the spending are weighed. Not only public education spending but also many social transfer programs and health spending increase the GDP per person. As a result, extensive literature that addresses the impact of social welfare spending on economic growth has evolved.

Although some authors demonstrated that government spending in the social sector could support economic growth (Afonso & Alegre, 2011; Afonso & Jalles, 2014; Baldacci et al., 2008; Furceri & Zdzienicka, 2012; Kumlin & Rothstein, 2005), others showed that social spending is detrimental to economic growth (Folster & Henrekson, 2001; Im et al., 2011a; Persson & Tabellini, 1994). Studies that provided evidence of the negative effects of social spending have claimed that government expenditure in the social sector affects taxpayers' incentive to work, and reduces private savings, which thus affects economic growth. For instance, Im et al. (2011) examined the economic effects of social spending in less developed nations and compared the situation with that in developed countries. The result suggests that social spending correlates negatively with economic growth in developed countries. In contrast, studies that advocated positive effects of social spending argue that government expenditure in the education and health sector promotes capital accumulation. This can be seen as a productive government expenditure, which enhances economic growth (Kumlin & Rothstein, 2005; Piachaud, 2013). Afonso and Alegre (2011) found that productivity significantly depended on education expenditure and that social security and health spending played relevant roles in the economic growth in the Euro-area panel during 1970-2006. Furceri and Aleksandra (2012) assessed the effects of social spending on economic activity in OECD countries from 1980 to 2005. The results indicate that social spending has expansionary effects on GDP.

³ https://en.wikipedia.org/wiki/There_ain%27t_no_such_thing_as_a_free_lunch

The government expenditure in the social sector has significant redistributive consequences. Foster (2012) found that social spending, that is, on health, education, and social welfare, seems to be redistributive in OECD countries. It has been argued by some scholars that social spending also helped many countries to enjoy the benefits of economic globalization without a large increase in income inequality (Gozgor & Ranjan, 2017; Urata & Narjoko, 2017). D'Agostino et al. (2020) studied the relationship between social spending and income inequality during the period 1980-2015 in 26 OECD countries by using panel data analysis. The result shows that social spending reduces income inequality. Niehues and Niehues (2010) explored whether social spending policies lead to less income inequality or whether the redistributive outcomes are offset by behavioral disincentive effects. The regression results suggest that more social spending effectively reduces inequality levels. Ospina (2010) used a panel dataset from 1980 to 2000 to analyze the determinants of income inequality in Latin American countries, and they paid special attention to education, health, and social security expenditures. These results show that education and health expenditures have a negative impact on income inequality. Cammeraat (2020) studied the impact of social spending on economic growth, income inequality and poverty in European Union using OLS and TSLS regressions. The results show a negative impact of social spending on poverty and income inequality. Cubero and Vladkova (2010) suggested that the redistributive impact of social spending is evident and progressive in Central American countries and that it decreases income inequality. Bergh et al. (2020) confirm that health spending results in lower-income quality even with economic globalization. Thus, the diversity of empirical findings highlights the need for addressing the interaction between social spending, income inequality, and economic growth. Although Arjona et al. (2003) showed that market income inequality leads to more social spending, which in turn reduces growth in OECD countries, it does not evaluate the effect of social spending on net income inequality.

Further, it has been theoretically argued that market income inequality tends to influence redistributive policies (Meltzer & Richard, 1981). This indicates that gross income inequality could be an important determinant of social policy outcomes. Few empirical studies have examined the impact of income inequality on social expenditure (Sudasinghe & Patmasiriwat, 2014). However, these studies did not make a distinction between gross and net income inequality. Accordingly, they have not considered the role of gross income inequality in determining its impact on social spending and how such impact influences the relationship between economic growth and net income inequality. Therefore, the present study analyzes the relationship between gross income inequality and social spending in light of the newly available and more consistent dataset, SWIID that provides two separate series of inequality information- gross and net inequality.

Thus, our study attempts to develop and estimate an empirical model of joint determinants of social spending, inequality, and economic growth in the context of developing countries (as shown in Figure 1). Figure 1 shows the main channels of influence discussed in this paper.

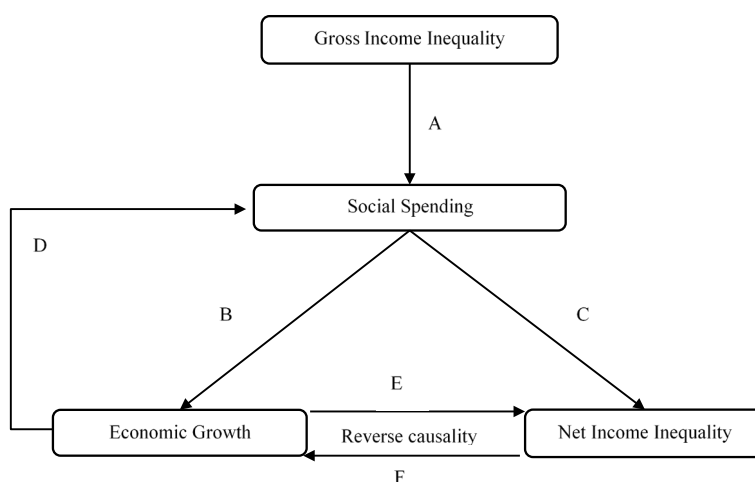


Figure 1. Framework describing the relationship between social spending, economic growth, and inequality.

In this study, the effects of gross income inequality on social spending in Asian economies (Line A) were first estimated econometrically. Next, the impact of social spending on economic growth (Line B) and income inequality (Line C) was examined in a system. Then, to consider the interaction between three endogenous variables (Lines D, E, and F), a simultaneous equation model (SEM) was used.

3. Database and Research Methodology

3.1 Database

For the empirical analysis, a panel dataset of 48 developing countries was used. The countries selected for this study and timeframe were determined by data availability. The annual data on various economic, political, and social factors were obtained from different sources for the period 1990-2015. Time series data on GDP, investment, trade openness, inflation, population, and urbanization were taken from World Development Indicators, World Bank. The data on market and net income inequality were obtained from SWIID (Standardized World Income Inequality Database, 201). The variables concerning government spending in the social sector were taken from the Government Finance Statistics, International Monetary Fund. Welfare spending is best captured by spending on health, education, and social security, as reported in the International Monetary Fund's Government Finance Statistics (Rudra, 2004). Therefore, in our analysis, social spending included government spending on health, education, and social protection.

In line with the work of Muinelo-Gallo and Roca-Sagalés (2013), three-year averages of all the variables in our analysis were considered because this helped to capture the effect of changes in

government expenditure in health, education, and social security on changes in economic growth and income inequality.

3.2 Empirical Methodology

This section discusses the methodological approach that is used to examine the interrelationship between government social spending, income inequality, and economic growth. The basic econometric specification consists of three equations that explore the linkage between three endogenous variables, namely, (1) economic growth, (2) net income inequality, and (3) government social spending.

In a neoclassical framework, tax and expenditure policies can be considered as important determinants of economic growth, but they are unlikely to have permanent effects on economic growth. In the endogenous growth model however where investment in human and physical capital affects the growth rate, government policies can play an important role in the growth process (Barro, 1996). Thus, the aggregate production function in the context of the endogenous growth model is $Y = f(L, K, G)$, where Y is the aggregated output, L is the labor force, K is the human and physical capital, and G is the fiscal variable (social spending in our case).

Therefore, the empirical specification of economic growth can be written as (Barro, 1996; Afonso & Jalles, 2014)

$$Y_{it} = \alpha + \beta_1(SS_{it}) + \eta_1(Z_{it}) + \pi_t + \alpha_t + \mu_{it}, \quad [1]$$

where Y_{it} is the change in growth rate and SS_{it} is the total government social expenditure and respective components (Education, Health, and Social Protection). Subscripts i and t denote the country and time period, respectively. The equation also includes some macroeconomic factors found in the literature as potential determinants of economic growth. The vector Z comprises the following variables: investment to GDP ratio, population growth rate, inflation, and trade openness. These control variables have been used in several studies examining the determinants of economic growth (Afonso & Jalles, 2014; Barro, 1996; Muinelo-Gallo & Roca-Sagalés, 2013). Investment has been considered as an engine of economic growth (Barro, 2003). Therefore, the expected sign of these variables is positive. While the Tobin-Mundell hypothesis stated that anticipated inflation causes portfolio adjustment, thus lowering the rate of interest and raising investment and growth, studies like Barro (1991); Castelló-Climent (2010) and Muinelo-Gallo & Roca-Sagalés (2013) found that inflation negatively impacts economic growth. Finally, trade expansion is expected to raise economic growth since, as a country specializes and exports, developmental gains from trade can contribute to a too high level of economic growth. However, human capital, which has been considered an important determinant of economic growth, is not included in the growth equation since the variable of interest in this study, that is social spending (education and health expenditure) denotes “human capital investment.” Therefore, the inclusion

of human capital could lead to a multicollinearity problem.

The benchmark equation for income inequality is based on the empirical model of Ospina (2010), Niehues and Niehues (2010), Odedokun and Round (2004), and Rudra (2004):

$$NI_{it} = \alpha + \beta_1(SS_{it}) + \eta_1(X_{it}) + \pi_i + \alpha_t + \mu_{it}, \quad [2]$$

where NI_{it} is the net income inequality, and SS_{it} is the government social spending and respective components (education, health, and social protection). In line with the empirical approaches of Ospina (2010), Niehues & Niehues (2010), Rudra (2004) and Muinelo-Gallo & Roca-Sagalés (2013), controls for the inequality equation take into account following variables - urbanization, globalization and civil liberty that are strongly associated with income inequality. Urbanization is an important determinant of income distribution. On the one hand, it has been argued that an increase in the urban population contributes to a higher middle class and more employment opportunities leading to a shifting in the labor force from agriculture to the urban sector. As a result, the less paid rural job becomes less important, and inequality is expected to decline. On the other hand, urbanization results in better health and education facilities, thus widening the gap between rich and poor. The measure of civil liberty considers the political control of the richest segment of the society and its influence on income distribution. Therefore, an increase in this measure tend to reduce income disparity.

Finally, the equation for government social spending is based on the theoretical framework given by Meltzer and Richard (1981), who argued that higher inequality would create pressures for redistribution:

$$SS_{it} = \alpha + \beta_1(GI_{i(t-1)}) + \eta_1(K_{it}) + \pi_i + \alpha_t + \mu_{it}, \quad [3]$$

where SS_{it} is the government social expenditure and $GI_{i(t-1)}$ is the one-year lagged market income inequality. Based on the empirical works of Baqir (2002), Buracom (2011), Huber et al. (2008), and Rudra and Haggard (2005), many political, economic, and demographic variables were taken as control variables. The social spending equation incorporates the following variables: (i) Trade openness, as Rodrik (1999) claimed that openness could have a positive effect on government commitments to welfare; (ii) Initial per capita income; (iii) Age structure of the population captured by the share of the population aged ≤ 14 years and ≥ 65 years (pop_15, pop_65); (iv) Political system (parliamentary, presidential, and assembly-elected presidential regimes), as Persson and Tabellini (2002) showed that parliamentary regimes have larger governments, that is, more expenditure than do presidential ones. (v) Revenue and Debt/GDP ratio: Increase in revenue is expected to have a positive impact on social expenditure, while high public debt tends to reduce expenditure on the social sector.

Given the interdependence between the variables (social spending, economic growth and income inequality), **a complete system of simultaneous equation model (SEM)** has been considered in this study. The three-way linkage between the variables are analyzed by the

following equations:

$$Y_{it} = \alpha + \lambda(NI_{1,it}) + \beta(SS_{1,it}) + \eta_1(Pop_{it}) + \eta_2(globalization_{it}) + \eta_4(Investment_{it}) + \eta_5(Inflation_{it}) + \pi_{1,i} + \alpha_{1,t} + \mu_{1,it} \quad [4]$$

$$NI_{it} = \rho + \xi(Y_{2,it}) + \chi(SS_{2,it}) + \omega_1(Urbanisation_{it}) + \omega_2(globalization_{it}) + \omega_3(Civil\ liberty_{it}) + \pi_{2,i} + \alpha_{2,t} + \mu_{2,it} \quad [5]$$

$$SS_{it} = \psi + \vartheta(GI_{3,i(t-1)}) + p_1(Pop_15_{it}) + p_2(Pop_65_{it}) + p_3(globalization_{it}) + p_4(Political\ system_{it}) + p_5(Revenue_{it}) + p_6(Public\ debt_{it}) + p_7(GDP\ per\ capita_{it}) + \pi_{3,i} + \alpha_{3,t} + \mu_{3,it} \quad [6]$$

where Y_{it} is the growth rate, NI_{it} is the net income inequality and SS_{it} is the government social expenditure (that is education, health and social protection). In all the equations, country and period dummies are included (π & α) to control for cross country heterogeneity and time-specific fixed effects i.e. global shocks that might affect the dependent variable but are not captured by the explanatory variables.

In this study, the SEM model was estimated using three-stage least squares (3SLS) because it takes into account heteroscedasticity and contemporaneous correlation among the errors across equations. This thus gives more efficient estimations of the relevant explanatory variables⁴.

Two conditions need to be satisfied for the identification of equations in SEM. These are (a) Order Condition: "An equation in a SEM satisfies the order condition for identification if the number of excluded exogenous variables from the equation is at least as large as the number of endogenous right-hand variables in the equation" and (b) Rank Condition: "In a model with M equations and M endogenous variables, an equation is identified if at least one nonzero determinant of order (M-1)(M-1) can be composed of the coefficients of variables excluded from that equation but included in other equations in the model" (Wooldridge, 2015). The examination of equations (4-5) shows that the number of exogenous variables in the system is sufficient for the order condition to be satisfied (equations are over-identified). The rank condition can be assumed to be satisfied in a model of such a size (Greene, 2003).

4. Empirical Findings

This section presents the empirical results for developing countries during 1990-2013. Table 1 shows the descriptive statistics of all the variables used in the analysis. Table 2 outlines the results of the 3SLS simultaneous model, which examines the relationships between economic growth, income inequality, and social spending.

⁴ For 3SLS methodology, refer to Zellner and Theil (1962) and Greene (2003).

Table 1. Summary statistics of all variables.

Variables	Observations	Minimum	Maximum	Mean	s.d.
GDP growth	382	-10.12	20.53	4.47	3.20
Net Income Inequality	348	24.75	62.21	42.74	7.67
Gross Income Inequality	348	24.16	72.90	46.43	8.66
Social Spending	374	0.18	23.10	7.30	4.40
Education Spending	367	0.14	11.08	3.69	2.15
Health Spending	371	0.01	6.78	1.74	1.18
Social Protection	338	0.01	14.27	2.25	2.70
Population Growth	384	-1.28	6.60	1.66	1.03
Investment	381	6.99	60.50	23.95	9.27
Globalization	384	9.85	94.21	51.84	14.25
Trade	376	16.21	213.78	78.59	38.15
FDI	380	-4.86	32.86	3.05	3.58
Inflation	377	-0.99	2237.44	43.20	208.20
Population of 15 years or less	384	13.44	51.55	33.84	7.94
Population of 65 years or above	384	2.32	18.98	5.28	2.79
Revenue	358	7.94	49.51	23.29	8.26
Public Debt	384	6.52	229.31	53.28	37.06
Civil Liberties	381	1.00	7.00	3.96	1.49
Presidential regime dummy	384	0.00	1.00	0.22	0.41
Parliamentary regime dummy	384	0.00	1.00	0.63	0.48
Urbanization	384	-3.49	8.99	2.73	1.59
Initial Per capita Income (Log)	384	2.29	7.43	4.40	1.22

Note: Sources are given in the appendix.

4.1 Economic Growth Equation

Panel A of Table 2 shows the impact of social spending and other macroeconomic variables on economic growth. In the case of control variables, it was found that investment has a significant and positive impact on economic growth. This result is in line with the finding of (Barro, 1996, 2000), who showed that economic growth depends positively on the investment ratio. Population growth, on the other hand, has expected negative sign with significant impact on economic growth. This suggests that, with the increase in population, some proportion of country's investment that was used to raise capital per worker gets diverted to provide capital for new workers. Therefore, the high rate of the population tends to have a negative effect on economic growth. Further, it is argued in the literature that countries that are more open to trade are likely to witness high economic growth because the opening of the economy to the global market

facilitates the transfer of technology and the diffusion of knowledge and helps to exploit the comparative advantage by increasing exposure to competition (Petrakos & Arvanitidis, 2008). In our empirical analysis, however, though the coefficient of globalization (measured as KOF index) is positive, it is statistically insignificant. Similarly, the inflation rate appears to be insignificant in the analysis. This can be due to problems of collinearity with the other macroeconomic variables like investment and social spending that are incorporated into the equation.

An important result derived from our analysis is that income inequality stimulates economic growth in developing countries. It may be possible that welfare programs of government in developing countries offset the negative impact of income inequality on economic growth. This result is consistent with the conventional textbook argument and empirical findings of Banerjee & Vashisht (2010); Forbes (2000) and Frank (2009). According to them, net income inequality has a positive impact on economic growth because of a) incentive considerations and b) high marginal propensity to save of the rich class. However, our results contradict with the empirical studies of Alesina & Rodrik (1994), Persson & Tabellini (1994) and Perotti (1996), who provides evidence of a negative relationship between income inequality and economic growth.

Finally, the results indicate that social expenditure significantly influences economic growth with an expected positive sign across developing countries. This shows that social spending in developing countries serves as a means of “making the pie larger” by stimulating GDP growth. This argument is supported by the success experienced by the Asian Tigers, which made use of social policy as a means of stimulating economic growth (Kwon, 2005). Through strategic investments in the workforce’s wellbeing, the Asian Tigers bring social policy to the mainstream of economic development (Kwon, 2005). Accordingly, these findings may serve as empirical justification for such a strategic approach to social spending. The positive coefficient of social expenditure further supports the argument given by the developmental welfare advocates that government expenditure on the social sector can be instrumental in growth. The developmental welfare proponents claimed that an increase in social expenditure creates a high-quality human capital base, and reduce social conflict, which thereby increases the level of social cohesion of the country and helps the workforce adapt to radically changing industrial structures and technology. This, in turn, contributes to the nation’s economic growth (Im et al., 2011b).

Furthermore, in relation to the components of social spending, the analysis reveals that after considering all the control variables, education and health expenditure have a significant positive impact on economic growth. This suggested that government expenditure in education and health care sector is an important ingredient to economic growth. Similar results were found by Folster & Henrekson (2001) and Im et al. (2011).

However, the coefficient of social protection is insignificant, indicating that government expenditure on social protection does not affect economic growth in developing countries. These results clearly quashed the claim of neoliberal economic theories that social protection measures harm the nation’s economy and should, therefore, be reduced in order to boost a country’s competitiveness.

4.2 Net Income Inequality Equation

The second part of table 2 (Panel B) illustrates the inequality equation. The results show that civil liberty index has negative and statistically significant effects on income inequality while urbanization remains statically insignificant. These findings are broadly similar to the results of Lin et al. (2009) and Muinelo-Gallo & Roca-Sagalés (2013), who reported that an increase in civil liberty constrains the capacity of the rich to influence policy and thus improves income distribution. Globalization entered into the regression equation with a significant positive sign. This thus indicates that trade openness exacerbates income inequality in developing countries. The impact of globalization is small but significant at 1% level. These findings lend support to globalization critics who focus on the developing world (Bergh & Nilsson, 2010; Dreher & Gaston, 2008; Jaumotte et al., 2013; Narayan, 2001)

It is interesting to note that in the presence of government social expenditure, the impact of economic growth on income inequality becomes insignificant. It could be possible that welfare programs of government in developing countries offset the effects of GDP growth on income inequality. This result is in line with the findings of Rudra (2004).

Panel B of Table 2 considered the control variables. It can be observed that the government social expenditure has a significant and sizable negative impact on income inequality. This finding, that government social expenditure is effective in redistributing income, supports recent World Bank and ILO reports that argue that government programmes in primary education or health care and social protection measures help alleviate the deep-rooted aspects of inequality by creating opportunities (or what Amartya Sen calls capabilities). The coefficient of social spending components, i.e. education spending, health spending and social protection, are all negative and significant. This suggests that these types of government expenditures are effective in reducing income inequality. The obtained results lend support to Sen's argument that allocating more funds to education and health sector improves income inequality, which in turn will entail a positive influence on economic growth. The results confirm the findings of Foster (2012) and Niehues & Niehues (2010).

4.3 Social Spending Equation

The lowermost part of table 2 gives the results concerning the determinants of social expenditure. In this case, the dependent variable is changed to take into account the components of social expenditure: aggregate social expenditure (column 1), education expenditure (column 2), health expenditure (column 3) and social protection (column 4).

Panel C of Table 2 shows that initial per capita income is insignificant in the case of overall social expenditure, but it has a significant negative impact on education and health spending. These results contradict the empirical findings of Persson & Tabellini (2002) and Muinelo-Gallo & Roca-Sagalés (2013), who observed that in OECD countries, richer economies more intensively carry out distributive expenditures. Further, there is a negative and significant

relationship between trade and social expenditure. These results support the proponents of the efficiency hypothesis that argues that integration with the global market threatens spending on social programs (Adserà & Boix, 2002; Hicks & Zorn, 2005; Kaufman & Segura-Ubiergo, 2001; Noy, 2011; Rudra & Haggard, 2005b). They proposed that the quest for international competitiveness places important constraints in social spending and leaves the government with no choice but to cut social spending. Concerning the components of social expenditure, while trade openness promotes education spending, it is insignificant in the case of health and social protection expenditure.

When demographic variables are considered, aged population (pop > 65) estimates are negative in the case of education spending but have opposite effects on health spending. The increase in the elderly population exerts pressure on the government to increase budget allocations in the health care sector (as reported by Sanz & Velázquez 2007). Furthermore, the population under 14 years of age is significantly related all three components of social expenditure. An increase in pop < 14 pushed up the level of education and health expenditure but lowered social protection spending. Similarly, a significant positive impact of revenue is found on social spending. Lastly, the significant and positive coefficient of parliamentary and presidential regimes indicates that as compared to assembly elected presidential regimes, both parliamentary and presidential systems are associated with higher levels of social spending. Further, the results confirm Persson and Tabellini's hypothesis in the case of health spending, showing that parliamentary regimes seem to be associated with larger health expenditure, but contradicts Persson & Tabellini (2002) in the sense that presidential regimes are associated with higher education and social protection expenditure.

The results obtained show that after considering the standard determinants of social spending (i.e. controlling for all political, economic and demographic variables), lagged gross income inequality has a significant positive impact on both education and health spending but is insignificant in the case of social protection. This result is consistent with the channel emphasized in the seminal work of Meltzer & Richard (1981), who argued that a higher market income inequality exerts pressure for more redistribution.

Table 2. SEM – Regression results**Panel A**

<i>Growth Equation</i>	Real GDP per capita growth (3SLS)	Real GDP per capita growth (3SLS)	Real GDP per capita growth (3SLS)	Real GDP per capita growth (3SLS)
Net Inequality	0.582*** (0.134)	0.479*** (0.119)	0.605*** (0.137)	0.288 (0.192)
Social Spending	0.610*** (0.185)	-	-	-
Education Spending	-	1.253*** (0.465)	-	-
Health Spending	-	-	1.636*** (0.683)	-
Social Protection	-	-	-	0.268 (0.515)
Population growth	-0.754*** (0.352)	-0.569** (0.360)	-0.821*** (0.336)	-0.719*** (0.377)
Inflation	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Globalization	0.008 (0.023)	0.021 (0.027)	-0.026 (0.024)	-0.032 (0.0232)
Investment	0.120*** (0.031)	0.106*** (0.029)	0.128*** (0.022)	0.141*** (0.024)
Country effects	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes
Adj R ²	0.11	0.16	0.06	0.39
No. of Observations	314	309	311	290

Panel B

<i>Net inequality Equation</i>	<i>Income Inequality (3SLS)</i>	<i>Net Inequality (3SLS)</i>	<i>Income Inequality (3SLS)</i>	<i>Net Inequality (3SLS)</i>	<i>Income Inequality (3SLS)</i>	<i>Real capita (3SLS)</i>	<i>GDP per growth</i>
Economic Growth	-0.013 (0.123)	-0.018 (0.135)	-0.054 (0.132)	-0.074 (0.138)			
Social Spending	-0.264*** (0.122)	-	-	-			
Education Spending	-	-0.608*** (0.303)	-	-			
Health Spending	-	-	-1.791*** (0.522)	-			
Social Protection	-	-	-	-0.888*** (0.285)			
Civil Liberties	-0.632*** (0.208)	-0.571*** (0.226)	-0.561*** (0.231)	-0.370 (0.257)			
Urbanization	0.227 (0.215)	0.209 (0.237)	0.377 (0.233)	0.292 (0.266)			
Globalization	0.023*** (0.311)	0.015 (0.022)	0.044*** (0.024)	0.053*** (0.025)			
Country effects	Yes	Yes	Yes	Yes			
Time effects	Yes	Yes	Yes	Yes			
Adj R ²	0.85	0.84	0.84	0.84			
No. of Observations	314	309	311	290			

Panel C

Social Equation	Spending	Aggregate Spending	Social Spending	Education Spending	Health Spending	Social Protection
Lagged Gross Income		0.646***		0.121***	0.082***	0.058
Inequality		(0.112)		(0.044)	(0.024)	(0.052)
Pop<14		0.439***		0.127***	0.119***	-0.164***
		(0.079)		(0.032)	(0.017)	(0.041)
Pop>65		-0.198		-0.094***	0.176***	0.006
		(0.331)		(0.139)	(0.074)	(0.179)
Parliamentary Regime		1.488		0.304	0.639***	0.470
		(0.994)		(0.415)	(0.222)	(0.515)
Presidential Regime		2.026***		0.089***	0.139	1.221***
		(0.782)		(0.340)	(0.174)	(0.459)
Globalization		-0.036*		0.016***	-0.001	-0.011
		(0.026)		(0.010)	(0.001)	(0.013)
Revenue		0.050		0.049***	0.020***	0.022
		(0.033)		(0.013)	(0.007)	(0.018)
Initial Per Capita		-0.592		-0.470***	-0.405***	-0.007
		(0.639)		(0.267)	(0.143)	(0.342)
Country effects	Yes		Yes		Yes	Yes
Time effects	Yes		Yes		Yes	Yes
Adj R ²		0.40		0.71	0.75	0.80
No. of Observations		322		317	319	297

Note Panel estimates of 48 developing countries using data for 1990-2013. Standard errors are given in parentheses. The statistical significance of the coefficients is as follows: ***significant at the 1% level, **significant at the 5% level and *significant at the 10% level.

5. Discussion and Policy Implications

The 3SLS simultaneous equation model gave mixed empirical results for developing countries for the relationship between components of social spending, economic growth, and income inequality during 1990-2013. The analysis shows that social protection, which has been recognized as a crucial mechanism by international organizations (e.g., World Bank, ILO, and UNO) and policymakers for reducing vulnerability without dampening economic growth, produces a significant reduction in net income inequality. This means that social protection measures that aim at achieving more equality do not harm economic growth in developing countries. In contrast, education and health spending both emerged as important components of social spending that can break the tradeoff between equity and efficiency, that is, it can lead to both growth and progressive distributional change. The results support Sen's approach to income inequality, which was based less on income and more on capability. According to this approach, policies like

boosting spending on health, education, and active labor reforms not only improve income distribution but also spur economic growth. However, the results defy the theoretical argument pointed by Okun (1975), who argued that policy interventions by the government could improve income distribution, but this comes at the cost of distorting incentives for work, investment, and so on, which in turn leads to worse economic performance.

Besides elaborating on the effects of social expenditure on growth and income inequality, the 3SLS estimates also shed light on the determinants of social spending. Overall, control variables such as the form of government, population below 15 years, globalization, and revenue, performed as expected across all the specifications. The results suggest that an increase in market income inequality leads to more demand for health and education expenditure. This finding confirms the important role of gross income inequality in determining social spending outcomes, as pointed out by Meltzer & Richard (1981), who claimed that a wider market inequality creates pressures for redistribution. On the contrary, the results do not give evidence in favor of the hypothesis that gross income inequality has a positive or negative effect on social protection spending.

These results have important policy implications for developing countries. First, with high budget deficits, the most appropriate policy for reducing income inequality without retarding growth is to increase budget allocation in the health and education sector. Such policy interventions by the government will facilitate the process of innovation, knowledge creation, and information and will have positive effects on economic growth (Benhabib & Spiegel, 1994). The enhancement of human capital development will further contribute to a reduction in income inequality. Second, social protection has emerged as an important redistributive policy. Therefore, to effectively tackle inequalities and promote economic growth, social protection systems need to be coherently designed in developing countries. Social protection policies in these countries need to focus on investment-type social spending, such as on active labor market policies and child education. Such policies can help to foster economic growth while enhancing child development, which has long-term payoffs in its own right. However, to do so, policymakers have to find innovative ways to reduce financing constraints and work on strengthening the political system that shapes the social protection policy of the country.

6. Conclusions

The recent food and economic crisis have brought social spending to the forefront of policy analysis. The interrelated shocks in food, fuel, and financial markets have resulted in a slowing down of the progress that many countries had made toward achieving internationally agreed development goals, including the Millennium Development Goals (United Nations ESCAP, 2013). These jolts make a strong case for expanding health and education services and moving toward social protection measures to mitigate the social costs of the crisis without harming economic growth. In this paper, we examined the importance of social spending as a redistributive tool and

an instrument for promoting economic growth in developing countries. The estimates show that increasing the expenditure on the social sector improves the distribution of income as well as promotes economic growth. As far as the components of social spending are concerned, the effects of social security expenditure on output were found to be statistically insignificant. Both increases in education spending and health spending can break the trade-off between efficiency and equity since an increase in education spending reduces inequality while promoting output. On the other hand, social protection spending is found to be redistributive in developing countries. Thus, after coalescing these results, we conclude that social expenditure and social spending can be used as a developmental tool in developing economies.

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Appendix 1. Data description and sources.

Variables	Description (1990-2013)	Sources
Real GDP per Capita	GDP per capita is the total gross domestic product of a country divided by total population.	World Development Indicators, World Bank
Real GDP growth rate	Annual growth rate	World Development Indicators, World Bank
Social Spending	Public expenditure on education, health and social security and welfare. It is measured as a percentage of GDP.	International Monetary Fund (GFS) Government finance statistics and Statistics of public expenditure for economic development database by International Food Policy Research Institute
Tax Revenue	Tax revenue refers to compulsory transfers to the central government for public purposes. It is measured as a % of GDP.	World Development Indicators, World Bank
Public Debt	Public debt refers to a part of the total borrowings by the central government which includes such items as market loans, special bearer bonds, treasury bills and special loans and securities issued by the central bank of the country. It also includes the outstanding external debt. It is measured as central government debt over the GDP.	World Economic Outlook, International Monetary Fund
Gross and Net Income Inequality	Gini's coefficient of market and net income	SWIID (Standardized World Income Inequality Database, 2014).
Urbanization	Urban population (% of total)	World Development Indicators, World Bank
Population	Annual growth rate of population	World Development Indicators, World Bank
Population<15 years	Population ages 15 and above as a percentage of the total population	World Development Indicators, World Bank
Population > 65 years	Population ages 65 and above as a percentage of the total population	World Development Indicators, World Bank
Political Regimes	Parliamentary, Assembly elected President and Presidential regimes	Database of Political Institutions, 2012, World Bank
Civil liberties	Civil liberties allow for the freedom of expression and belief, associational and organizational rights and rule of law. This index ranges from 1 to 7 scale with 1 representing the higher level and 7 lower level.	Freedom House
Inflation	Annual percentage change in the consumer price index	World Development Indicators, World Bank
Investment	Total value of the gross fixed capital formation and changes in inventories and acquisitions less disposals of valuables for a unit or sector (as a % of GDP)	World Economic Outlook, International Monetary Fund
Globalization	Covers Economic dimension of Globalization i.e FDI, FII and Terms of trade (KOF Index).	Feenstra et al. (2015), Penn World Tables

Appendix 2. List of countries in the sample.

Developing countries (Upper and lower middle countries)

Algeria	China	Jamaica	Belarus
Angola	Fiji	Mexico	Egypt
Botswana	Malaysia	Panama	Ghana
Iran	Thailand	Peru	Kenya
Jordan	Maldives	Guatemala	Morocco
Lebanon	Brazil	Venezuela	Nigeria
Mauritius	Colombia	Russia	Tunisia
Namibia	Costa Rica	Turkey	Yemen
South Africa	Dominica Republic	Bulgaria	Zambia
Srilanka	Bolivia	El Salvador	Indonesia
Mongolia	Philippines	Papua New Guinea	Vietnam
Bangladesh	Bhutan	India	Pakistan