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Fiscal Capacity, Democratic Institutions and Social Welfare Outcomes in Developing Countries

Syed Mansoob Murshed [ID][a], Brahim Bergougui [ID][b,c], Muhammad Badiuzzaman[d] and Mohammad Habibullah Pulok [ID][e,f]

[a]International Institute of Social Studies (ISS), Erasmus University Rotterdam, the Hague, The Netherlands and Coventry University, UK; [b]Department of Macroeconomics and Economic Integration, Research Center in Applied Economics for Development (CREAD), Bouzareah, Algérie; [c]Department of Macroeconomics and Econometrics, National School of Statistics and Applied Economics (ENSSEA), Kolea, Algeria; [d]ISS, Erasmus University Rotterdam, The Hague, The Netherlands, & Research Coordinator, Centre for Peace and Justice, BRAC University, Bangladesh; [e]Centre for Health Economics Research and Evaluation (CHERE), University of Technology Sydney (UTS), Australia; [f]Nova Scotia Health Authority, Halifax, Canada

ABSTRACT

The purpose of this paper is to gauge the various determinants of social sector spending captured by social protection and education spending in a cross section of developing countries, a subject on which there is scant empirical evidence. We hypothesize that fiscal capacity is necessary but not sufficient for resource allocation in this area, because the political will to do so must also be present. Using a panel data instrumental variable approach, we find that greater fiscal capacity robustly raises social spending in developing countries in the period 1990 to 2010. It is also strongly evident that rising democratisation enhances social sector spending; the presence of greater democracy and higher fiscal capacity could reinforce this effect. Our work also innovatively incorporates inequality into the analysis, finding that social expenditure is greater in more egalitarian societies. Military expenditure also appears to crowd out social protection expenditure, but not robustly.

Introduction

The positive impact of social welfare programmes in areas such as poverty-inequality reduction, consumption smoothing, human development, and economic growth across various countries or regions of the world has been emphasized in the literature (Alderman and Yemtsov, 2012; 2013; Barrientos 2013; Easterly 2007; Gebregziabher and Niño-Zarazúa 2014). There is also evidence to suggest that social spending is on the rise in the developing world. But its implementation in developing countries is constrained by inadequate fiscal capacity. Among other factors, strengthening fiscal capacity has been identified as a crucial avenue for financing social protection schemes (ILO 2014a).

There is convincing empirical evidence in favour of a positive effect of fiscal capacity on long-term economic performance, as well as a complementary between fiscal capacity, state development, and institutional quality (Besley and Persson 2010; Dincecco and Katz 2016; Dincecco and Prado 2012). In developed countries, greater social spending is supported by strong fiscal capacity in the presence of well-functioning democracy, which traditionally favoured redistribution given a history

of inequality. However, there is little evidence on the causal link between fiscal capacity and social spending across the developing world where the majority of the poor live. The objective of this paper is to investigate the causal relationship between the fiscal capacity of the state and its social expenditure, hypothesizing that fiscal capacity is necessary but not sufficient for resource allocation in this category. Consequently, we also investigate the role of democracy, the quality of government, inequality, and military expenditure in determining the amount of social spending.

In general, fiscal capacity is an indication of the level of development of a country's fiscal system; in other words, a more general indicator of state capacity. It could be seen as a proxy for the government's ability to implement complex policies (Rogers and Weller 2013). The relationship between fiscal capacity and social sector spending is more complex than it appears to be. First, fiscal capacity, by providing the necessary resources, directly allows implementation of social protection programmes which, in turn, ensure the provision of public goods for the poor in particular. Second, fiscal capacity is crucial for the creation and maintenance of a qualified and efficient bureaucracy, capable of implementing government policies and programmes. Finally, robust fiscal capacity, along with effective constraints on the executive, is also indicative of a functional bargain between the state and the economic elites, which not only facilitates taxing the higher income group but also can promote the implementation and success of policies (Papadia 2016). Developing countries systematically seem to have lower fiscal capacity and smaller government size relative to developed countries and emerging economies (see Table 1). A weaker fiscal capacity diminishes state capacity in its multifarious functions, including social welfare spending.

We aim to advance our understanding of the determinants of social spending by examining the causal relationship between fiscal capacity and social welfare expenditure, along with the role of politics in a cross-section of developing countries from 1990 to 2010. Additionally, we examine the relation between the degree of social spending and inequality. Our analysis pertains to both fiscal capacity and the political will to spend public money in this direction. We employ panel data instrumental variables (IV) methods to address endogeneity problems in estimating the causal

Table 1. State capacity in selected OECD and non-OECD countries in 2010.

Country	Total tax to GDP ratio	Government expenditure to GDP ratio	Social protection expenditure to GDP ratio
OECD countries			
United Kingdom	32.22	46.33	23.56
Germany	35.01	47.87	25.89
Japan	26.48	39.01	16.23
Australia	26.30	36.77	18.16
Canada	31.01	43.82	18.14
Sweden	43.17	50.63	27.56
Non-OECD countries			
Argentina	29.07	38.78	18.13
Bangladesh	7.29	14.59	2.69
Brazil	33.60	39.44	21.29
China	22.52	22.47	6.83
Congo. Dem. Rep.	8.89	31.58	3.71
Ecuador	12.64	35.65	4.37
India	16.90	27.98	2.64
Indonesia	9.67	18.23	2.63
Kenya	15.73	29.66	2.61
Malaysia	13.30	28.53	2.89
Morocco	22.82	31.9	6.57
Peru	15.33	20.27	6.85
Senegal	14.88	27.18	5.34
South Africa	27.00	32.31	9.79
Uganda	9.24	19.69	3.46
Viet Nam	19.19	33.06	6.28

Note: OECD – Organisation for Economic Co-operation and Development.
Source: Author's calculation based on GRD (2019) and ILO (2014a) data.

impact of fiscal capacity on social welfare expenditure. We also control for relevant covariates found in the literature and carry out robustness checks on our main results.

Our findings suggest that greater fiscal capacity robustly raises social spending, along with higher per capita income, whereas greater external debt servicing inhibits this category of expenditure. Rising democratization enhances social sector spending; the presence of greater democracy and higher fiscal capacity could reinforce this effect. We also find that more equal societies spend more on social protection, and military expenditure can weakly crowd out certain types of social sector expenditure, once we control for inequality and democracy.

The rest of the paper is organized as follows: section 2 presents the theoretical and empirical underpinnings of our investigation; section 3 outlines our model specification, data, and econometric strategy; section 4 presents our econometric results; and finally, section 5 contains some conclusions.

Theoretical and Empirical Underpinnings

We first turn to the economic rationale for social welfare, which essentially revolves around the debate about the nexus between income and wealth inequality and economic growth, as well as the political will to effect redistribution via social welfare expenditures.[1]

The developing world has made major strides in reviving growth and poverty reduction since the beginning of the new millennium. But major concerns remain about groups that are being left behind in this march towards greater prosperity. This includes the growing tide of inequality throughout the world during our present era of globalization (Piketty 2014; Stiglitz 2012), with some temporary exceptions in selected Latin American countries. The chief misgivings regarding these developments are to do with the income and wealth share of the richest 1% or 10% of the population. If we take a truly cosmopolitan view, treating the entire planet as a single entity, global inequality may have declined by about 2% Gini points between 1988 and 2008 to around 70.5 (Lakner and Milanovic 2015), but this finding, as the authors point out, may mask the serious underestimation of the income of the top decile in the income distribution, who are often missed out in household surveys. Jorda and Niño-Zarazúa (2019) indicate that once the missing income of the richest is taken into account (using tax records in selected countries) the global income distribution looks different, and global inequality estimates based on household surveys alone have a downward bias of 15–42%, especially for low-income countries and sub-Saharan Africa. Accompanying this rise in inequality has been the increased informalization of work, combined with the growth of vulnerable jobs without regulatory protection and social insurance (ILO 2014b). In addition, the wealth share of the richest 1% in the world is greater than the rest of the population's (99%) total wealth, according to some sources (Oxfam 2016); according to Credit Suisse (2010) less than 1% of the richest in the world own more than one-third of the world's wealth. The power thus conveyed is bound to impact on policy-making, particularly on tax policies that permit the richest to pay lower taxes on their wealth, as well as preventing policy coordination between nations to prevent tax avoidance. The political influence of the wealthy is growing, as remarked upon by Stiglitz (2012), and a recent Oxfam (2016) report.

Our first concern is with the efficiency aspects of the growth and inequality relationship, and hence, indirectly, the merits of social welfare in redressing inequality. Classical and neoclassical growth theories emphasized the role of saving (invested in productive capacity), chiefly by the owners of capital, in generating growth. In this connection, a greater degree of inequality may accompany initial growth spurts, as exemplified by the famous Kuznets (1955) hypothesis about the inverted U-shaped relationship between income inequality and per capita income. As growth accelerates, inequality first rises, but after reaching a certain peak in average income, inequality begins to decline. This pattern certainly explains the growth history of the earliest industrialized nations, such as the UK and the USA, as demonstrated by Kuznets (1955). Since the 1980s, however, inequality is widely regarded to be on the increase again in most advanced industrialized nations.

Inequality can facilitate greater economic growth if capitalists are more innovative and save a greater proportion of their income compared to other classes (Kaldor 1957). But this may not apply if the greater inequality is a result of the acquisition of a rent by the highest income earners, rather than returns from productive investment in manufacturing, as is the case for much of the financial investments of the wealthiest at present (see Orhangazi 2008 on financialization). Moreover, the Kuznets relationship does not seem to hold for the post-Second World War growth experiences in East Asia (Alesina and Rodrik 1994). In contrast with the theories of growth embodying exogenous technical progress, endogenous growth theories highlight the importance of human capital in promoting growth, thus implying the positive role of publicly funded education. Easterly (2007) demonstrates that a higher middle class share of income does promote growth, because the middle classes traditionally clamour for more growth-enhancing public goods, including publicly funded education and health care.

Dabla-Norris et al. (2015) and Ostry, Berg, and Tsangarides (2014) show that the recent growth experiences of a cross-section of developed and developing countries suggest that inequality is harmful to growth prospects. This could be because greater inequality leaves economies more prone to financial crises,[2] greater inequality results in less human capital accumulation, and because inequality contains within it the seeds of conflict, which is harmful for growth. On the causes of recent rises in income inequality, Dabla-Norris et al. (2015) point out that unskilled labour-saving technical progress, financial globalization (but not trade openness), and less regulation of labour markets, including the informalization of work, are the chief culprits.

In empirical models, redistributive policies, including social expenditures, appear to no longer harm growth prospects (Ostry, Berg, and Tsangarides 2014) in recent years across countries. Traditionally, it was believed that greater government consumption was negatively correlated with growth (Tavares and Wacziarg 2001), because of crowding-out effects and distortions to incentives. Thus, redistributive policies financed by taxation were distortion-inducing, even when they resulted in greater equity and social justice. Economic efficiency and equity needed to be *separated*, and furthermore, there was an efficiency–equity trade-off (see Okun 1975), empirical evidence for which seems to have weakened in recent years, linked, among other phenomena, to new forms of market failure.

Market failures emanating from credit and labour market imperfections can result in harmful inequality, justifying intervention and redistribution. Among such failures is the presence of adverse selection (Stiglitz 2012), which makes the competitive equilibrium and its associated income distribution no longer Pareto optimal. Adverse selection in credit and labour markets can lead to inefficient outcomes for the economy that also exacerbate both poverty and inequality, as the poor are credit rationed, have less access to education, and experience disproportionate downward pressure on their real wages. Stiglitz and Weiss (1981) built the seminal analytical model of credit rationing with adverse selection, which disadvantages the poor and is of considerable empirical and policy relevance in developing countries. Bénabou and Tirole (2013) construct an analytical model of excessive bonus pay for the skilled, and under-incentivization of the low paid, with substantial welfare losses for the economy.

Traditional arguments against excessive inequality were grounded in purely 'equity' considerations based on society's aversion to highly unequal outcomes. A modicum of unequal outcomes as a reward for differential effort, talent and risk-taking can be regarded as fair, but what is both unjust and inefficient is inequality of opportunity (Roemer 1998). This may be rooted in either systematic discrimination or unequal access to opportunities, such as education. It can be argued that present day trends in the distribution of income, with the accelerating share of the top 1% in the global income distribution, do produce inequality of opportunity and hamper intergenerational mobility, particularly because much of the wealth of the wealthiest is principally attributable to a rent earned from speculative financial investments. In the ultimate analysis, in the presence of many market imperfections, adverse selection, substantial economic rents, and inequality of opportunity, the separability between the efficiency and equity arguments against inequality cannot be

maintained, but above all make social protection and redistributive policies justifiable. Gebregziabher and Niño-Zarazúa (2014) present evidence to suggest that social spending improves the inequality-adjusted human development index of the United Nations Development Programme (UNDP) and public health expenditure reduces child mortality.

Where there is a distributive conflict between the haves and the have nots, a high degree of inequality may damage future growth prospects (Alesina and Rodrik 1994), thus explaining the redistributive policies pursued after the Second World War in North-East Asia (particularly with regard to land redistribution) prior to these countries' growth spurt, and the absence of a Kuznets relation there. Rodrik (1999) argues that social conflict measured by indicators such as inequality, unless managed by well-functioning institutions, can lead to growth collapses. In other words, persistent inequality destabilizes society and the social contract; this may produce social conflict, even if it is not full-blown armed conflict.[3]

Another crucial determinant of social spending is the state's commitment to inequality reduction. It has been suggested that higher per capita income is associated with more fiscal capacity, but social spending does not always go up accordingly, being a matter of politics also. Table 1 indicates that richer countries tend to have greater tax capacity and more social protection spending; among developing countries, low-income nations have lesser fiscal capacity, and lower social protection expenditure, compared to middle-income countries like Argentina and Brazil. South Africa has more fiscal capacity and greater social protection expenditure compared to the rest of the sub-Saharan region, both due to its relative affluence and its unique political history. Ghana has greater social sector spending as a proportion of gross domestic product (GDP) than India in 2010, even though India's revenues and government spending are greater, due to India's higher military expenditure. Similarly, the Congo, despite having substantial fiscal capacity by regional standards, has lower social sector spending. Therefore, the capacity to spend in this direction needs to be reinforced by political will, and the right admixture of institutions and political competition.

This leads us to political economy considerations, as the choice and implementation of policies by the state are fundamentally the outcome of strategic interaction between different factions with different interests. The pressure for redistribution results in the initial democratic contract (Acemoglu and Robinson 2009), with some power transferred to the less affluent and consequently some redistribution. Downs (1957) famous median voter theory suggests that the median voter's preferences prevail in a democracy. Meltzer and Richard (1981) suggest that increases in the size of government in democracies are due to median voter pressure for redistribution. This is either due to the extension of the franchise (which lowers the median voter's income relative to the national mean income) or occurs when economic growth or transformation raises the average or mean income above that of the median voter, implying greater inequality. Dodlova and Giolbas (2016) find some evidence supporting the Meltzer and Richard (1981) median voter thesis, but encounter difficulties in satisfactorily identifying the link between changes in inequality and redistributive transfers.

The hypothesis that increased democracy brings forth greater social sector spending in Latin America and the Caribbean is borne out by findings in Snyder and Yackovlev (2000), Mayoral and Nabernegg (n.d.), but less strongly in Huber, Mustillo, and Stephens (2004), particularly during democratic transitions (when political inclusion is rising), and especially for expenditure on health and education relative to social welfare per se. Shonchoy (2010), while analysing total government expenditure in developing countries, also finds total spending positively related to democracy. Dodlova and Lay (2016) argue that democracies, compared to autocracies, are more likely to institute pro-poor transfers; autocracies provide social welfare mainly as a response to revolutionary threats. Programmes under autocracies, however, are likely to be less conditional and attract larger budgets. Egger, Radulescu, and Strecker (2016) demonstrate that, besides political factors, there may also be geographical spread from one country to another of social welfare type expenditures via a demonstration effect throughout history; this mechanism may account for its recent emergence

or surge in developing countries, particularly in Latin America. Arguably, the fragility of social spending in the advanced economies that are also democracies in our recent age of globalization is due to the strengthening of the political clout of the wealthy, as well as the breakdown of earlier redistributive social contracts and median voter power.[4]

A related issue concerns military expenditures in developing countries. These have been found to be a mixed blessing; see Deger and Sen (1995). Does military expenditure crowd out social sector spending of all types, or is there a complementarity between certain categories of military and social sector spending, such as on education. For a panel of developed 29 OECD countries, Lin, Ali, and Lu (2015) find that military expenditure does not crowd out social sector expenditure. Kollias and Paleologou (2011) find a similar result for Greece. But for developing countries that are more fiscally constrained, a different outcome is possible.

In summary, a degree of social welfare is necessary to avoid distributive and social conflicts, particularly with greater globalization and when the tide of inequality is on the rise. As far as the determinants of social spending are concerned, it is predicated both on economic capacity – the fiscal capacity of the state – as well as political factors, which are chiefly about how the state and society respond to inequality and poverty, but also related to how well the state functions (the quality of governance). Thus, both economic capacity and political will, the two ingredients making up state capacity, determine the existence and extent of social welfare expenditures.

Model Specification and Econometric Methods[5]

Model Specification and Data

Our empirical hypothesis is that social spending is a function of state capacity: which has economic and political dimensions. To investigate primarily the impact of fiscal capacity and institutions on the allocation of social sector spending, we make use of a panel dataset comprised of 84 developing countries from 1990 to 2010.

Many previous studies have considered social protection or education expenditures as a proxy to social spending (Kollias and Paleologou 2011; Gassman, Mohnen, and Vinci 2016). However, we distinguish our study from much of previous empirical work by taking a broader definition of social spending to include government spending on social protection, education (Haile and Niño-Zarazúa, 2018). This will give us insight into what aspect of social sector spending, fiscal policy and democratic institutions have the most impact.

The social protection expenditures data are taken from the ILO database contained in a report (ILO 2014a) because it has maximum country coverage over time for developing countries. This data source has cross-country comparable data for public expenditure on social protection, poverty alleviation programmes and health; it is also utilized as the dependent variable in the cross-country study by Gassman, Mohnen, and Vinci (2016).[6] Data on this variable are only available for every five-year interval point during the period 1990–2010, which entails five observation points. Matching the dependent variable, we take five-year average of our data on other explanatory and control variables. As this data base does not include public spending on education, we estimate the determinants of education separately to get a more complete picture of non-security sector public expenditure. The education expenditures data are drawn from the UNESCO databases. We use government expenditure on education as a percentage of GDP.

To be more specific in carrying out econometric estimation, we estimate several models to examine our hypotheses. On the fiscal capacity side, our first hypothesis is that the extent of social sector spending depends upon the resources available to the state in which we are interested in looking at the causal relationship between these two variables. To this end, following to Dincecco and Prado (2012), our preferred proxy for fiscal capacity is the total tax to GDP ratio plus grants. In contrast with Besley and Persson (2009), we consider all types of taxes since the share of direct taxes in total revenues of developing taxes is still small, even if it is increasing. Including grants is

appropriate because certain types of public expenditure, on health and education in particular, are mandated by aid donors, and this is effected via direct budgetary support in many developing countries. Hence, grants of these types are meant to boost fiscal capacity. Excluding grants, however, from the definition of fiscal capacity does not alter our results, except marginally. We have excluded the natural resource tax revenues as these revenues are a bounty of nature and are not part of the political and societal build-up of fiscal capacity. The tax to GDP ratio were collected from Government Revenue Dataset (GRD). As alternatives, in our robustness checks, we consider Total Tax to GDP ratio from World Development Indicators of the World Bank. Total tax to GDP ratio from the Government Financial Statistics database of the IMF (n.d.), Direct taxes to GDP ratio and Income tax to GDP ratio from Government Revenue Dataset (GRD2019) as proxies.

Although fiscal capacity is in principle correlated with GDP per capita growth, as this is not always the case, we include GDP per capita growth as a control variable for the size of the economy. When GDP per capita growth rises beyond a certain point, social sector spending can rise more than proportionately, as in the case of OECD countries. The resources available to the state may be (substantially) diminished by the burden of servicing debt incurred in the past; to this end, we incorporate debt servicing to national income ratios as an explanatory variable. An additional variable of interest may be growth in population, which may be an indication of increasing dependency and a growing labour force. This may result in the growth of GDP, but if social spending does not rise proportionately, it will have a negative impact on our dependent variable.

The first, as well as our base model, takes the following form:

$$Y_{it} = \beta_0 + \beta_1 F_{it} + \beta_1 X_{it} + u_{it} \ (1)$$

In equation (1), i and t indicate country and year, respectively, Y_{it} stands for public expenditure on social welfare. F_{it} is our main variable of interest, fiscal capacity (defined as total non-resource taxes proportional to GDP), and X_{it} is the vector of all control variables, namely, GDP per capita growth, military expenditure to GDP ratio, debt servicing as a proportion of gross national income (GNI), and population growth. In the above equation, u_{it} comprises both time-invariant unobserved country-specific effects (fixed effects) e_i, and a time-variant unobserved component v_{it}.

On the political side, in accordance with the literature on the determinants of social sector expenditure, we incorporate the degree of democracy, as democracies are more likely to spend on social welfare. This may be all the more important following the second wave of democratization following the end of the Cold War. We deployed the well-known hybrid Polity 2 combined scores of democracies (ranging from 0 at the bottom end to 10 for perfect democracies) and autocracy (extending from −10 for the worst to 0). An alternative measure of democracy is the V-DEM data on democracy and egalitarianism; see Coppedge et al. (2016). This data shows much greater variation and has the advantage of a variety of sub-components which are fine grained to capture more aspects of democracy. In particular, it separates a liberal democracy index from the electoral democracy index. While elections are common in most developing countries respect for liberal values are less common. The V-DEM electoral democracy index plays close attention to aspects of electoral fairness and freedom of expression. The separate liberal democracy index and is concerned with judicial and legislative constraints on the executive, as well as respect for human rights and equality before the law. These two indicators of democracy do not always move together, especially in recent times. In addition, V-DEM also provides us with the participatory (direct participation by civil society, for example) and deliberative democracy (degree of consultation) index. It is also important to examine the effect of institutional quality, as this could have an impact on social sector expenditure. To this end, indicators of the quality of government, which is the mean value of the International Country Risk Guide (ICRG) variables corruption, law and order, and bureaucratic quality, scaled 0–1, is taken, with a higher value indicating improved governance (see Dahlberg et al. 2013 for details). Our second model can be expressed as follows.

$$Y_{it} = \beta_0 + \beta_1 F_{it} + \beta_2 P_{it} + \beta_3 X_{it} + u_{it} \quad (2)$$

In equation (2), P_{it} represents the polity, V-DEM liberal, electoral, participatory, deliberative and egalitarian indices and quality of government variable, run in separate models as alternative estimates of each other.

Arguably, an important determinant of social sector spending is inequality, as discussed in the preceding section. Social sector spending redresses inequality, but current inequality (rather than past inequality) may reflect societal or the ruling class attitudes to inequality: a more inequality-averse society may engage in greater social spending. We utilize three independent variables to capture income inequality. In particular, we employ both a Gini and a Palma ratio Index taken from the Global Income Dataset (GID) included within the Global Consumption and Income Project (GCIP). It is computed through coefficients of equalized household disposable income. The GID dataset offers Gini coefficients for the vast majority of countries in the world (more than 160) for every year for more than half a century (1960–2015). We also use egalitarian democracy index as a different measure of inequality taken from V-DEM, which is a broad measure of equal protection, access to and distribution of resources. It does not focus strictly on income, but has health and education inequalities built in. To capture the effect of inequality, we include an inequality variable in the third model after controlling for explanatory and control variables. Furthermore, introducing an inequality variable in the base model shows how society's attitude towards inequality affects the role of fiscal capacity on social welfare spending. We can show this model in the following way. In equation (3), I_{it} represents the inequality variable in the form of either the Gini coefficient, Palma ratio or egalitarian measures, which are run in separate models as alternative estimates of each other.

$$Y_{it} = \beta_0 + \beta_1 F_{it} + \beta_2 I_{it} + \beta_3 X_{it} + u_{it} \quad (3)$$

Econometric Methods

As a natural starting point for panel data analysis, we begin our estimation applying pooled ordinary least square (OLS) methods to the above specification. The advantage of using pooled OLS is that it uses more information by combining cross-sectional and time-series observations to get more reliable estimates of the parameters compared to cross-sectional OLS. Pooled OLS provides unbiased and consistent estimates as long as the composite error term u_{it} is uncorrelated with X_{it}. However, the presence of unobserved time-invariant country-specific characteristics or fixed effects e_i in the composite error term u_{it} makes it likely to be correlated with the explanatory variables. This problem can be mitigated by employing a fixed effects (FE) technique, which removes the unobserved country-specific heterogeneity by within-transformation effects. However, the FE model eliminates a significant amount of the variation of the explanatory variables leading to measurement errors.

We now turn to the potential problem of endogeneity to estimate the causal effect of fiscal capacity on social spending expenditure. The presence of endogeneity makes regression estimates a measure of only the magnitude of association rather than the magnitude and direction of causation. Fiscal capacity measured by total non-resource tax to GDP ratio is likely to be endogenous for three possible reasons: reverse causality between fiscal capacity and social sector expenditure, model misspecification or omitted variables, and measurement errors. There is a possibility that fiscal capacity and social spending expenditure are jointly determined by some other factors. An instrumental variable (IV) technique should be used, and we estimate a two-stage generalized method of moments (IV/GMM2S) model.

To deal with the endogeneity of fiscal capacity, we use the share of agriculture in GDP and the share of natural resource rents in GDP as two instruments in our analysis. Successful implementation of the IV method relies on three identifying assumptions. The first is instruments' relevance or a strong first stage. That is, selected instruments must be highly correlated with the endogenous variable. Second, instruments must be exogenous, which means they are uncorrelated with the error

term. This is also known as testing for over-identifying restrictions. Finally, instruments must meet exclusion restrictions, which means that instruments do not appear as separate regressors in the second stage regression. In summary, we can say that valid, relevant and strong instruments affect the dependent variable only through the endogenous variable. Both of these variables are highly correlated with fiscal capacity, the latter (natural resource rents) contributes positively to revenues, whereas the former may have an adverse effect on revenues if land taxes are low or avoided. Our argument is that the share of agriculture in GDP is largely unrelated to social sector expenditure, whereas resource rents are related to such expenditure only in highly autocratic states without representative government (Ross 2012). The identifying assumptions of these instruments are tested using available statistical tests (the Kleibergen–Paap Wald test, the Cragg–Donald F-statistic, the Sargan–Hansen test, etc.) and relevantly discussed in the following results section. In all our models, standard errors are country-cluster corrected robust standard errors.

In line with Gebregziabher and Niño-Zarazúa (2014) and Chiripanhura and Niño-Zarazúa (2015), we have conducted several robustness checks to test the validity of our findings. This includes alternative sample analysis (restricting the sample to low- and middle-income countries and less democratic countries), using alternative measures/data sources for fiscal capacity and use of alternative estimators. According to Hahn, Hausman, and Kuersteiner (2004), Limited Information Maximum Likelihood (LIML) and Continuously Updating Estimator (CUE) tend to perform better than IV methods in the presence of weak instruments. So, we estimate both LIML and CUE to correct for finite sample bias in IV method. Apart from LIML and CUE, we have also used Fuller's modified LIML in our robustness analysis.

Descriptive Statistics

Table 2 presents the descriptive statistics of our study sample. It suggests that there is an increase between 1995 and 2010 in the average share of national income devoted to social protection, education expenditure, although the country coverage for the latter year is greater. There is also a slight increase in the average fiscal or revenue capacity. The burden of debt servicing also appears to have declined. Compared to 1995, the degree of democracy has increased in 2010, as indicated by various VDEM measures of democracy. The Polity indicator also suggests the march of democracy.

Table 2. Summary statistics.

	1995		2010	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Social protection expenditure to GDP ratio	4.491	3.909	6.549	4.458
Government expenditure on education to GDP ratio	3.581	1.373	4.36	1.542
Total non-resource tax to GDP ratio	13.328	6.473	16.598	7.163
Total tax to GDP ratio (WDI)	4.491	3.909	17.213	7.184
Total tax to GDP ratio (GFS)	3.581	1.373	14.279	5.976
Direct taxes to GDP ratio (GRD)	5.015	1.628	7.099	4.686
Income tax to GDP ratio (GRD)	13.328	6.473	5.333	2.821
Military expenditure to GDP ratio	2.034	1.358	1.708	1.174
Population growth (%)	1.965	1.649	1.728	1.099
Per capita GDP (constant price of year 2005)	1.673	7.118	5.123	2.534
Debt servicing to GNI ratio	5.462	5.401	4.021	5.999
Electoral democracy	0.469	0.194	0.509	0.183
Liberal democracy	0.311	0.183	0.346	0.183
Participatory democracy	0.274	0.139	0.31	0.141
Deliberative democracy	0.316	0.202	0.361	0.205
Egalitarian index	0.308	0.153	0.341	0.154
Polity	1.325	6.044	2.966	5.604
GINI	0.53	0.089	0.518	0.079

Note: (1) WDI- World Development Indicators 2019. (2) GFS -Government Financial Statistics 2019. (3) GRD- Government Revenue Dataset 2019. Source: Authors' calculation based on panel dataset.
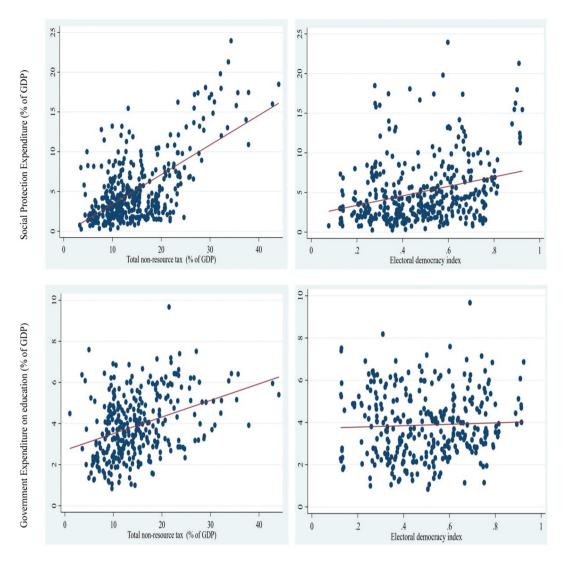
Figure 1. Relationship of fiscal capacity and democracy with social welfare outcomes.

There is little discernible change in the quality of governance and standard GINI and Palma ratio measures of inequality, but the VDEM index of egalitarianism has risen.

Figure 1 illustrates bivariate relationships between social welfare expenditure, fiscal capacity (Total non-resource tax to GDP ratio) as well as the degree of electoral democracy. As seen in Figure 1, a positive relationship between the three social spending measures and fiscal capacity and between social spending and the degree of electoral democracy.

Results

Before presenting the regression results, we discuss the justification for using share of agriculture in GDP and the share of natural resource rent in GDP as our instruments for fiscal capacity. First, F-statistics of the Cragg–Donald test of weak identification well exceeds the rule of thumb value (10) in all models where IV/GMM2S is employed. The finite-sample corrections of this test, the Kleibergen–Paap Wald statistic, also easily exceeds conventional critical values. This suggests the

strong partial correlation between the included endogenous variable and the excluded instruments in our study. The first-stage results (not reported here) suggest that our instruments are individually correlated with fiscal capacity. The null hypothesis of zero correlation between the instruments and fiscal capacity in Kleibergen–Paap rk LM under-identification test is also strongly rejected. Finally, the Hansen test of over-identifying restrictions suggests that the validity of the instruments cannot be rejected. These indicate that the instruments have a strong association with fiscal capacity but are not significantly correlated with social expenditure once the relevant explanatory variables are controlled for, which endorses the validity of our specifications.

The estimation results of the baseline model in equation (1) are presented in Table 3. We report results for three types of models, our preferred approach is IV/GMM2S. The estimated coefficients show consistent support for a positive and significant effect of fiscal capacity on all categories of public expenditure. According to the results shown in column (3) and (6) of Table 3, if there is an increase in fiscal capacity by 1%, social protection expenditure increases by 0.387 percentage points and education expenditure increases by 0.192 percentage points, respectively. This suggests that fiscal capacity is important in sustaining social welfare spending.

We now turn to discuss the implication of findings for the control variables. We find that military spending has a mostly insignificant effect except in column (2) where the fixed effect is employed. We found that military expenditure crowds out total social protection expenditures but not education expenditure. This suggests that military expenditures reduce the capacity of government to direct expenditures to social welfare outcomes, except education.

We also find that the debt servicing variable has negative and significant effect on total social protection as shown in columns (2) and (3) of Table 3. The coefficient on population growth is negative and significant on total social protection expenditure. As indicated earlier, this may be due to the fact that a growing population leads to an increase in national income, but social spending

Table 3. Impact of fiscal capacity on social welfare outcomes.

Dependent variable	Social protection expenditure (% of GDP)			Expenditure on education (% of GDP)		
Regression method	OLS	FE	IV/GMM2S	OLS	FE	IV/GMM2S
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)
Total non-resource taxes to GDP Ratio	0.302***	0.214***	0.387***	0.085***	0.121***	0.192**
	(0.056)	(0.060)	(0.115)	(0.021)	(0.022)	(0.085)
Military expenditure to GDP Ratio	0.045	−0.221**	−0.115	−0.030	0.053	0.065
	(0.172)	(0.103)	(0.175)	(0.080)	(0.079)	(0.095)
GDP growth	0.050	0.054*	0.013	−0.005	−0.002	−0.012
	(0.055)	(0.030)	(0.040)	(0.017)	(0.013)	(0.016)
Pop growth	−1.007***	−0.542***	−0.463***	0.074	−0.096	−0.062
	(0.252)	(0.184)	(0.166)	(0.108)	(0.074)	(0.071)
Debt service to GNI ratio	0.007	−0.107***	−0.118***	0.031	−0.012	−0.006
	(0.039)	(0.025)	(0.025)	(0.024)	(0.009)	(0.013)
Constant	2.253*	3.796***		2.423***	2.256***	
	(1.170)	(1.010)		(0.486)	(0.397)	
Observations	363	363	346	312	312	295
R-squared	0.475	0.272	0.198	0.146	0.149	0.103
Country FE	×	√	√	×	√	√
Number of countries	84	84	81	82	82	75
Cragg-Donald F-stat			18.90			11.47
Kleibergen-Paap F-stat			9.559			6.513
Kleibergen-Paap LM-stat			10.86			9.372
Hansen test (p-value)			0.697			0.823

Notes: (1) Robust standard errors are in parentheses. (2) *significant at 10%; **significant at 5%; ***significant at 1%. (3) OLS, ordinary least squares; FE, fixed-effects; IV/GMM2S, two-step efficient generalized method of moments estimator. GMM2S models are implemented in the xtivreg2 package for Stata16.1. (4) Instrumental variables for models (3), (6), and (9) are share of agriculture in GDP and the share of natural resource rent in GDP. The first-stage F-tests (test of weak identification) is greater than 10 and Hansen J statistic (test of the over-identifying restrictions) fails to reject the hypothesis that the instrumental variables are exogenous. This indicate that the three instruments are sufficiently correlated with the potentially endogenous regressor (fiscal capacity) and that they are not directly correlated with the dependent variable (Social expenditure). This suggests they are strong and valid instruments for fiscal capacity.

may not be rising in proportion; in some instances, per capita income and the revenues of the state do not rise in proportion to population growth. The coefficient of per capita GDP growth is positive, and significant in the fixed effects estimate (column 2). This means that growing mean income leads to greater social protection spending, which is why richer countries have proportionately bigger governments.

If we exclude grants from our measure of fiscal capacity the main results described above, especially with respect to fiscal capacity, remain unchanged (see Table A.6). This is also true when we alter our definition of fiscal capacity to other measures and data sources (see Table A.5) with one exception, for education expenditure using data from the World Bank. Direct taxes, in particular, positively and significantly contribute to all types of public expenditure (Table A.5). When we utilise the V-DEM indices of democracy in Table 4 involving electoral democracy, liberal democracy, deliberative democracy and participatory democracy the results are statistically significant. The degree of democracy is positively related to total social protection, as well as education spending. This finding is in line with the literature that, in general, greater democracy promotes higher social sector spending. In our robustness tests for alternative measures of institutions, when we try the alternative and widely used Polity measure of democracy the results are significant for total social protection expenditure, but not education spending (Table A.4). If we exclude grants from our measure of fiscal capacity in Table 4 described above, our results remain unchanged (see Table A.7)

Table 4. Impact of fiscal capacity and each of the four democratic-institution measures on social welfare outcomes. IV/GMM2S Estimate.

Dependent variable	Social protection expenditure (% of GDP)				Expenditure on education (% of GDP)			
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total non-resource taxes to GDP Ratio	0.451***	0.452***	0.420***	0.466***	0.159**	0.163**	0.092	0.157**
	(0.138)	(0.137)	(0.146)	(0.138)	(0.066)	(0.067)	(0.074)	(0.065)
Military expenditure to GDP Ratio	0.022	0.027	0.047	0.021	0.124	0.123	0.096	0.123
	(0.165)	(0.164)	(0.156)	(0.169)	(0.084)	(0.084)	(0.075)	(0.084)
GDP growth	0.020	0.020	0.013	0.021	0.008	0.007	0.012	0.008
	(0.033)	(0.032)	(0.033)	(0.033)	(0.023)	(0.023)	(0.022)	(0.023)
Pop growth	−0.378**	−0.360*	−0.386**	−0.345*	−0.103	−0.089	−0.148**	−0.089
	(0.191)	(0.187)	(0.186)	(0.189)	(0.081)	(0.080)	(0.076)	(0.079)
Debt service to GNI Ratio	−0.101***	−0.103***	−0.109***	−0.106***	0.000	−0.002	−0.004	−0.001
	(0.028)	(0.028)	(0.027)	(0.028)	(0.014)	(0.014)	(0.012)	(0.014)
Electoral democracy	3.260***				1.891**			
	(1.232)				(0.947)			
Liberal democracy		4.190***				2.146*		
		(1.383)				(1.161)		
Participatory democracy			5.010**				4.453***	
			(2.299)				(1.300)	
Deliberative democracy				2.229**				1.801**
				(1.136)				(0.804)
Observations	327	327	329	327	279	279	282	279
R-squared	0.272	0.276	0.295	0.253	0.174	0.173	0.235	0.180
Country FE	√	√	√	√	√	√	√	√
Number of countries	77	77	78	77	71	71	72	71
Cragg-Donald F-stat	19.04	19.51	17.29	19.43	15.27	15.83	11.89	15.38
Kleibergen-Paap F	11.08	11.29	9.922	11.01	7.068	7.288	5.509	7.002
Kleibergen-Paap LM	12.49	12.51	11.43	12.40	9.729	9.919	9.267	9.550
Hansen test (p-value)	0.817	0.795	0.809	0.753	0.367	0.393	0.160	0.395

Notes: (1) Robust standard errors are in parentheses. (2) *significant at 10%; ** significant at 5%; *** significant at 1%. (3) IV/GMM2S, two-step efficient generalized method of moments estimator. GMM2S models are implemented in the xtivreg2 package for Stata. (4) Instrumental variables for models (3), (6), and (9) are share of agriculture in GDP and the share of natural resource rent in GDP. The first-stage F-tests (test of weak identification) is greater than 10 and Hansen J statistic (test of the over-identifying restrictions) fails to reject the hypothesis that the instrumental variables are exogenous. This indicate that the three instruments are sufficiently correlated with the potentially endogenous regressor (fiscal capacity) and that they are not directly correlated with the dependent variable (Social expenditure). This suggests they are strong and valid instruments for Fiscal capacity.

The other macroeconomic covariates remain largely unchanged from the baseline estimations in Table 3. Thus, as indicated earlier, fiscal capacity is not the only determinant of social sector expenditure, other political factors are also relevant. We also tried out the impact of governance measured by the composite quality of government index (Table A.4). The results indicated a positive, but statistically insignificant contribution of governance to social welfare spending. Hence, we may infer that the degree of democracy is more important than governance in determining the extent of social welfare expenditure. This, however, leaves open the question regarding the quality of social sector provision, which is beyond the scope of our paper; the quality of services may be related to the standards of governance. The sign and significance of the other covariates are largely same as before.

We now turn our attention on the role of inequality in social spending, as this is an indication of society's attitudes towards aversion to current inequality. We find that income inequality in the form of the Gini coefficient has a negative and insignificant effect on both total social protection expenditure and education spending, as is shown in column (2) and (5) of Table 5. We also employed the Palma ratio in place of the Gini coefficient; the results indicate that income inequality in the form of Palma ratio has a negative and significant effect on total social protection (column (3) of Table 5). When we utilise the V-DEM egalitarian index the coefficients are positive and significant (columns 1 and 4 of Table 5). When grants are excluded from the fiscal capacity definition the Palma ratio mentioned above becomes insignificant, and the egalitarian component index from VDEM becomes insignificant only for education expenditure but retains its significance for total social protection expenditure (see Table A.8).

Table 5. Impact of fiscal capacity and each of the three inequality measures on social welfare outcomes. IV/GMM2S Estimate.

Dependent variable	Social protection expenditure (% of GDP)				Expenditure on education (% of GDP)	
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)
Total non-resource taxes to GDP Ratio	0.446***	0.529***	0.541***	0.148**	0.192***	0.197***
	(0.148)	(0.134)	(0.138)	(0.068)	(0.065)	(0.067)
Military expenditure to GDP ratio	0.015	−0.036	−0.021	0.120	0.108	0.111
	(0.165)	(0.196)	(0.195)	(0.084)	(0.085)	(0.085)
GDP growth	0.022	0.022	0.020	0.011	−0.003	−0.004
	(0.034)	(0.032)	(0.031)	(0.024)	(0.026)	(0.025)
Pop growth	−0.359*	−0.303*	−0.296	−0.100	−0.068	−0.063
	(0.195)	(0.182)	(0.182)	(0.080)	(0.077)	(0.079)
Debt service to GNI Ratio	−0.105***	−0.099***	−0.099***	−0.001	−0.004	−0.005
	(0.028)	(0.027)	(0.026)	(0.014)	(0.013)	(0.013)
Egalitarian index	4.414**			2.969**		
	(2.229)			(1.508)		
GINI		−0.671			−0.581	
		(3.825)			(2.229)	
Palma ratio			−0.137*			−0.038
			(0.079)			(0.030)
Observations	327	339	339	279	290	290
R-squared	0.275	0.088	0.082	0.185	0.118	0.116
Country FE	√	√	√	√	√	√
Number of countries	77	80	80	71	74	74
Cragg-Donald F-stat	17.75	23.01	21.85	14.18	18.20	17.37
Kleibergen-Paap F-stat	10.87	14.02	13.41	6.608	9.324	9.092
Kleibergen-Paap LM	12.40	13.81	13.20	9.421	12.08	11.64
Hansen test (p-value)	0.853	0.745	0.790	0.346	0.310	0.306

Notes: (1) Robust standard errors are in parentheses. (2) *significant at 10%; ** significant at 5%; *** significant at 1%. (3) IV/ GMM2S, two-step efficient generalized method of moments estimator. GMM2S models are implemented in the xtivreg2 package for Stata. (4) Instrumental variables for models (3), (6), and (9) are share of agriculture in GDP and the share of natural resource rent in GDP. The first-stage F-tests (test of weak identification) is greater than 10 and Hansen J statistic (test of the over-identifying restrictions) fails to reject the hypothesis that the instrumental variables are exogenous. This indicate that the three instruments are sufficiently correlated with the potentially endogenous regressor (Fiscal Policy) and that they are not directly correlated with the dependent variable (Social expenditure). This suggests they are strong and valid instruments for Fiscal capacity

This suggests that social sector spending as a proportion of national income is higher in more egalitarian societies. Societies with a greater inequality tolerance may become immune to the suffering of the poor, and systematically spend less in alleviating poverty and redressing inequality, as pointed out in Gassman, Mohnen, and Vinci (2016). This may be especially so when the gap in income (and wealth) of the super-rich widens in relation to both the poor and middle classes. The size of the coefficient on fiscal capacity is larger than before, suggesting that fiscal capacity plays an important role in determining the extent of social welfare in inequality-averse societies. The other covariates retain their earlier sign and significance.

Robustness Analysis

Since our sample consists of upper middle income, middle income, lower middle income and low-income developing countries, the effect of fiscal capacity on social sector spending may be large and significant. So, we truncate our sample to include only low- and middle-income countries to exclude more affluent (upper-middle income) countries in this step of robustness check. We find that the impact of fiscal capacity on social spending is still positive and significant across all models (Table A.1). We find similar results by excluding more democratic countries with a polity score of 6 and above (see Table A.2). It must be noted that democracy still contributes positively and significantly to social spending even in less democratic nations. Alternative estimators also provide similar findings (see Tables A.3). Finally, using a set of alternative measures and data sources for fiscal capacity does not largely alter our findings (see Table A.5), except fiscal capacity becomes insignificant for education spending when utilising World Bank data. Therefore, robustness analyses suggest that the results for the full sample hold in sub-samples and is consistent irrespective to the use of different estimators.

Conclusions

Our results suggest that the most robust explanatory variable for social spending variables is fiscal capacity measured as total tax revenues as share of GDP, which is invariably significant with a positive sign. Our results suggest that a 1% increase in fiscal capacity (as a percentage share of GDP) increases social protection spending (% GDP) by 0.387 percentage points and increases education expenditure (% GDP) by 0.192 percentage points, respectively. After that, the military expenditure tens to crowd out only one type of the social welfare expenditures (i.e. social protection spending). As far as public education expenditure is concerned, there may be some positive complementarities between the two. The burden of external debt servicing almost always (in the panel data estimations) exerts a negative and significant impact on social sector spending. Higher per capita income growth also has a positive and significant impact on the three types of social spending in nearly all of our panel data type estimations. Taken together, these findings reinforce our intuition that richer countries with a greater fiscal capacity can afford more social sector expenditure. Population growth invariably has a negative and significant impact on social expenditure as a proportion of national income.

Fiscal capacity is necessary, but not sufficient, in determining the extent of social welfare expenditure. As hypothesized, greater democracy promotes more social welfare expenditure, as it leads to the greater realization of median voter preferences for more social welfare. More democratic nations, on an average, care more about the poor or the middle classes, who are the chief beneficiaries of certain types of social sector expenditure in developing countries. The rising tide of social sector spending in developing countries over the last two decades has also been accompanied by a movement from autocracy to (imperfect and electoral) democracy in the developing world. Interestingly, good governance, despite its positive impact on social sector spending, is mainly insignificant, suggesting that as far as the determinants of expenditure are concerned, a democratic polity rather than good governance is more important. This leaves an open question

as to the quality of social provision, as well as specific societal preferences of the type of social sector spending which may be more closely related to good governance.

Our paper also employs income inequality as a determinant (or control variable in the determination) of social sector expenditure. We utilize Gini coefficients of inequality and the Palma ratio of the shares of the rich relative to the poor, as well as the V-DEM egalitarian index which is the most significant. The more egalitarian the society, the greater the degree of social welfare, suggesting that the increased separation of the poor and middle classes from the rich and super-rich is not propitious for these types of public spending. The extent of social welfare in inequality-averse societies is constrained by fiscal capacity. The presence of conflict in the form of either civil war or war can exert upward pressures to bring about social sector expenditure, but this effect is not statistically significant.

As far as the policy implications are concerned, efforts to promote greater social sector spending should aim at debt relief and greater fiscal capacity. On the institutional side, greater democracy, especially greater democracy in conjunction with fiscal capacity, promotes this type of spending.

Besides alleviating absolute and grinding poverty, social welfare can help to redress the harmful effects of inequality, particularly inequality of opportunity, which is arguably the great scourge of our time. As indicated in our literature review, inequality has also become growth retarding during recent times, and social sector expenditures do not appear to crowd out growth prospects. Enhanced fiscal capacity is key to the goal of greater social welfare spending, and in this connection, it is crucial to be able to increase taxation of the ultra-rich and the multinational corporate sector, who both adroitly and through political clout avoiding their fair share of tax. Otherwise, all efforts in the direction of greater justice with increased prosperity for the majority will, like faith without charity, come to nothing.

Notes

1. As far as developing countries are concerned, there was a greater consensus, until recently, about the need to reduce poverty via 'pro-poor' growth relative to the importance attached to lowering inequality; see, for example, remarks made by Anne Krueger of the IMF in 2002 (https://www.imf.org/external/np/speeches/2002/092602a.htm, accessed on 14 January 2015).
2. This is because the extremely wealthy demand a high return to their financial investments, and the financial debt burden of the relatively poor, if securitized, can make economies more prone to financial crises, which in turn can cause major recessions.
3. Inequality between distinct ethnic groups, a concept known as horizontal inequality, can be a major cause of civil war; see, for example, Murshed (2010: chapter 3).
4. The growing share of wealth relative to national income, according to Piketty (2014), resulting in the functional distribution of income becoming less favourable to labour, is central to these developments.
5. Table B.1 gives details of our data sources and Table B.2 gives the list of countries in our sample.
6. Their study is a cross-sectional analysis, whereas our analysis is a panel covering the 1990 to 2010 period.

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Disclosure Statement

ORCID

Syed Mansoob Murshed 🆔 http://orcid.org/0000-0002-8360-033X
Brahim Bergougui 🆔 http://orcid.org/0000-0002-2179-8854
Mohammad Habibullah Pulok 🆔 http://orcid.org/0000-0002-9168-5732

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Table A1. Impact of fiscal capacity on social welfare outcomes in low- and middle-income countries.

Dependent variable	Social protection expenditure (% of GDP)			Expenditure on education (% of GDP)		
Regression method Independent variable	OLS (1)	FE (2)	IV/GMM2S (3)	OLS (4)	FE (5)	IV/GMM2S (6)
Total non-resource taxes to GDP Ratio	0.228**	0.214***	0.571**	0.136***	0.146***	0.245***
	(0.110)	(0.064)	(0.235)	(0.031)	(0.026)	(0.083)
Military expenditure to GDP Ratio	0.056	−0.101	0.200	0.010	0.093	0.204**
	(0.130)	(0.090)	(0.152)	(0.094)	(0.094)	(0.094)
GDP growth	0.053	0.048	−0.032	−0.007	0.017	0.011
	(0.074)	(0.031)	(0.061)	(0.029)	(0.014)	(0.020)
Pop growth	−0.883***	−0.223	0.017	0.058	−0.074	−0.025
	(0.319)	(0.175)	(0.210)	(0.145)	(0.063)	(0.069)
Debt service to GNI ratio	−0.070	−0.156***	−0.147***	−0.011	−0.012	−0.006
	(0.046)	(0.038)	(0.036)	(0.023)	(0.011)	(0.029)
Constant	2.839**	2.250**		1.836**	1.745***	
	(1.360)	(1.038)		(0.691)	(0.468)	
Observations	229	229	214	205	205	191
R-squared	0.302	0.293	0.002	0.231	0.209	0.140
Country FE	×	√	√	×	√	√
Number of countries	55	55	52	54	54	49
Cragg-Donald F-stat			4.090			5.469
Kleibergen-Paap F-stat			3.007			2.936
Kleibergen-Paap LM-stat			6.301			6.622
Hansen test (p-value)			0.231			0.0888

Notes: (1)Robust standard errors are in parentheses. (2) *significant at 10%; **significant at 5%; ***significant at 1%. (3) OLS, ordinary least squares; FE, fixed-effects; IV/GMM2S, two-step efficient generalized method of moments estimator. GMM2S models are implemented in the xtivreg package for Stata16.1. (4) Instrumental variables for models (3), (6), and (9) are share of agriculture in GDP and the share of natural resource rent in GDP. The first-stage F-tests (test of weak identification) is greater than 10 and Hansen J statistic (test of the over-identifying restrictions) fails to reject the hypothesis that the instrumental variables are exogenous. This indicate that the three instruments are sufficiently correlated with the potentially endogenous regressor (Fiscal capacity) and that they are not directly correlated with the dependent variable (Social expenditure). This suggests they are strong and valid instruments for Fiscal capacity.

Table A2. Impact of fiscal capacity on social welfare outcomes in less democratic countries.

Dependent variable	Social protection expenditure (% of GDP)			Expenditure on education (% of GDP)		
Regression method	OLS	FE	IV/GMM2S	OLS	FE	IV/GMM2S
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)
Total non-resource taxes to GDP Ratio	0.211***	0.148**	0.360*	0.112***	0.121***	0.255***
	(0.068)	(0.056)	(0.194)	(0.024)	(0.022)	(0.098)
Military expenditure to GDP Ratio	0.260*	−0.099	0.119	0.029	0.053	0.029
	(0.150)	(0.082)	(0.132)	(0.076)	(0.079)	(0.094)
GDP growth	0.089*	0.062*	0.027	−0.013	−0.002	−0.028**
	(0.053)	(0.035)	(0.064)	(0.018)	(0.013)	(0.013)
Pop growth	−0.601**	−0.351*	−0.317	0.128	−0.096	0.019
	(0.242)	(0.208)	(0.205)	(0.089)	(0.074)	(0.045)
Debt service to GNI ratio	−0.005	−0.199***	−0.203***	0.081***	−0.012	−0.009
	(0.050)	(0.064)	(0.058)	(0.023)	(0.009)	(0.052)
Constant	1.571	3.770***		1.495***	2.256***	
	(1.377)	(1.097)		(0.494)	(0.397)	
Observations	210	210	189	178	312	157
R-squared	0.366	0.323	0.294	0.404	0.186	0.243
Country FE	×	√	√	×	√	√
Number of countries	64	64	51	62	82	46
Cragg-Donald F-stat			7.395			5.374
Kleibergen-Paap F-stat			3.488			2.661
Kleibergen-Paap LM-stat			6.006			3.308
Hansen test (p-value)			0.979			0.845

Notes: (1)Robust standard errors are in parentheses. (2) *significant at 10%; **significant at 5%; ***significant at 1%. (3) OLS, ordinary least squares; FE, fixed-effects; IV/GMM2S, two-step efficient generalized method of moments estimator. GMM2S models are implemented in the xtivreg2 package for Stata. (4) Instrumental variables for models (3), (6), and (9) are share of agriculture in GDP and the share of natural resource rent in GDP. The first-stage F-tests (test of weak identification) is greater than 10 and Hansen J statistic (test of the over-identifying restrictions) fails to reject the hypothesis that the instrumental variables are exogenous. This indicate that the three instruments are sufficiently correlated with the potentially endogenous regressor (Fiscal capacity) and that they are not directly correlated with the dependent variable (Social expenditure). This suggests they are strong and valid instruments for Fiscal capacity.

Table A3. Impact of fiscal capacity on social welfare outcomes (Alternative IV estimators).

Dependent variable	Social protection expenditure (% of GDP)			Expenditure on education (% of GDP)		
Regression method	CUE	LIMI	Fuller	CUE	LIMI	Fuller
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)
Total non-resource taxes to GDP Ratio	0.529***	0.518***	0.512***	0.143	0.155	0.154
	(0.139)	(0.141)	(0.138)	(0.092)	(0.099)	(0.097)
Military expenditure to GDP ratio	−0.037	−0.041	−0.043	−0.260	−0.257	−0.257
	(0.196)	(0.195)	(0.194)	(0.169)	(0.169)	(0.169)
GDP growth	−0.303*	−0.303*	−0.308*	0.108	0.116	0.116
	(0.183)	(0.183)	(0.182)	(0.071)	(0.072)	(0.072)
Pop growth	0.022	0.020	0.021	−0.003	−0.002	−0.002
	(0.032)	(0.032)	(0.032)	(0.017)	(0.017)	(0.017)
Debt service to GNI ratio	−0.099***	−0.101***	−0.101***	−0.039**	−0.039**	−0.039**
	(0.028)	(0.028)	(0.028)	(0.019)	(0.018)	(0.018)
Observations	339	339	339	301	301	301
R-squared	0.087	0.100	0.107	0.140	0.134	0.134
Country FE	√	√	√	√	√	√
Number of countries	80	80	80	80	80	80
Cragg-Donald F-stat	21.06	21.06	21.06	24.46	24.46	24.46
Kleibergen-Paap F-stat	12.69	12.69	12.69	12.43	12.43	12.43
Kleibergen-Paap LM-stat	12.96	12.96	12.96	13.28	13.28	13.28
Hansen test (p-value)	0.749	0.746	0.744	0.647	0.654	0.653

Notes: (1)Robust standard errors are in parentheses. (2) *significant at 10%; **significant at 5%; ***significant at 1%. (3) CUE, continuously-updated estimator; LIML, Limited Information Maximum Likelihood; Fuller, Fuller's modified LIML estimator. (4) Instrumental variables for all models are share of agriculture in GDP and the share of natural resource rent in GDP. The first-stage F-tests (test of weak identification) is greater than 10 and Hansen J statistic (test of the over-identifying restrictions) fails to reject the hypothesis that the instrumental variables are exogenous. This indicate that the three instruments are sufficiently correlated with the potentially endogenous regressor (Fiscal capacity) and that they are not directly correlated with the dependent variable (Social expenditure). This suggests they are strong and valid instruments for Fiscal capacity.

Table A4. Impact of fiscal capacity on social welfare outcomes (Alternative measure of political institutions).

Dependent variable	Social protection expenditure (% of GDP)		Expenditure on education (% of GDP)	
Independent Variable	(1)	(2)	(4)	(5)
Total non-resource taxes to GDP Ratio	0.420***	0.430**	0.112	0.116
	(0.149)	(0.176)	(0.114)	(0.098)
Military expenditure to GDP ratio	0.004	−0.340	−0.251	−0.173
	(0.161)	(0.281)	(0.171)	(0.129)
GDP growth	−0.420**	−0.565**	0.060	−0.117
	(0.209)	(0.237)	(0.078)	(0.144)
Pop growth	0.019	0.079	0.019	0.016
	(0.042)	(0.058)	(0.023)	(0.027)
Debt service to GNI ratio	−0.069*	−0.081***	−0.057**	−0.039**
	(0.037)	(0.023)	(0.025)	(0.017)
Polity	0.116**		0.031	
	(0.051)		(0.022)	
icrg_qog		0.535		−0.030
		(1.301)		(0.785)
Observations	323	271	286	238
R-squared	0.230	0.250	0.170	0.165
Country FE	×	√	×	√
Number of countries	76	63	76	63
Cragg-Donald F-stat	15.18	9.875	16.49	10.30
Kleibergen-Paap F-stat	8.438	6.339	7.548	4.865
Kleibergen-Paap LM-stat	10.20	8.540	10.44	8.458
Hansen test (p-value)	0.721	0.745	0.553	0.863

Notes: (1)Robust standard errors are in parentheses. (2) *significant at 10%; **significant at 5%; ***significant at 1%. (3) OLS, ordinary least squares; FE, fixed-effects; IV/GMM2S, two-step efficient generalized method of moments estimator. GMM2S models are implemented in the xtivreg2 package for Stata16.1. (4) Instrumental variables for all models are share of agriculture in GDP and the share of natural resource rent in GDP. The first-stage F-tests (test of weak identification) is greater than 10 and Hansen J statistic (test of the over-identifying restrictions) fails to reject the hypothesis that the instrumental variables are exogenous. This indicate that the three instruments are sufficiently correlated with the potentially endogenous regressor (Fiscal capacity) and that they are not directly correlated with the dependent variable (Social expenditure). This suggests they are strong and valid instruments for Fiscal capacity.

Table A5. Impact of fiscal capacity on social welfare outcomes (alternative measure of fiscal capacity).

Dependent variable	Social protection expenditure (% of GDP)				Expenditure on education (% of GDP)			
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal Capacity: Alternative Measures								
Total tax to GDP ratio (WDI)	0.537**				0.074			
	(0.213)				(0.067)			
Total tax to GDP ratio (GFS)		0.464***				0.154**		
		(0.123)				(0.060)		
Direct taxes to GDP ratio (GRD)			0.841***				0.287***	
			(0.222)				(0.104)	
Income tax to GDP ratio (GRD)				0.717***				0.307***
				(0.178)				(0.116)
Military expenditure to GDP ratio	−0.245	−0.085	−0.092	−0.327**	0.122	0.094	0.081	−0.025
	(0.304)	(0.219)	(0.203)	(0.164)	(0.129)	(0.097)	(0.097)	(0.092)
GDP growth	0.156***	0.016	0.031	0.066*	0.004	0.004	−0.004	0.003
	(0.047)	(0.033)	(0.031)	(0.035)	(0.019)	(0.025)	(0.025)	(0.026)
Pop growth	−1.003**	−0.252	−0.260	−0.429**	−0.156	−0.087	−0.075	−0.145
	(0.425)	(0.194)	(0.202)	(0.172)	(0.129)	(0.083)	(0.083)	(0.097)
Debt service to GNI ratio	−0.126***	−0.105***	−0.080***	−0.084***	−0.016	−0.003	−0.000	−0.003
	(0.048)	(0.027)	(0.026)	(0.025)	(0.024)	(0.013)	(0.012)	(0.014)
Observations	200	339	318	322	163	290	276	282
R-squared	0.065	0.081	−0.103	0.042	0.086	0.093	0.037	−0.027
Country FE	√	√	√	√	√	√	√	√
Number of countries	64	80	77	77	54	74	71	73
Cragg-Donald F-stat	9.689	21.27	16.43	24.03	20.18	19.27	14.16	17.98
Kleibergen-Paap F	8.762	13.49	14.88	14.97	15.77	5.363	7.364	11.18
Kleibergen-Paap LM	11.41	13.80	14.02	14.08	6.309	10.02	12.07	12.35
Hansen test (p-value)	0.705	0.605	0.778	0.542	0.457	0.102	0.154	0.172

Notes: (1) Robust standard errors are in parentheses. (2) *significant at 10%; ** significant at 5%; *** significant at 1%. (3) IV/ GMM2S, two-step efficient generalized method of moments estimator. GMM2S models are implemented in the xtivreg2 package for Stata16.1. (4) Instrumental variables for models (3), (6), and (9) are share of agriculture in GDP and the share of natural resource rent in GDP. The first-stage F-tests (test of weak identification) is greater than 10 and Hansen J statistic (test of the over-identifying restrictions) fails to reject the hypothesis that the instrumental variables are exogenous. This indicate that the three instruments are sufficiently correlated with the potentially endogenous regressor (Fiscal capacity and that they are not directly correlated with the dependent variable (Social expenditure). This suggests they are strong and valid instruments for Fiscal capacity. (5) WDI- World Development Indicators 2019. (6) GFS -Government Financial Statistics 2019. (7) GRD-Government Revenue Dataset 2019

Table A6. Impact of fiscal capacity on social welfare outcomes (excluding grants from fiscal capacity).

Dependent variable	Social protection expenditure (% of GDP)			Expenditure on education (% of GDP)		
Regression method	OLS	FE	IV/ GMM2S	OLS	FE	IV/GMM2S
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)
Total non-resource taxes to GDP ratio excluding grants	0.278***	0.172***	0.363***	0.074***	0.096***	0.203**
	(0.052)	(0.052)	(0.107)	(0.019)	(0.023)	(0.096)
Military expenditure (% of GDP)	0.059	−0.226**	−0.124	−0.019	0.042	0.072
	(0.164)	(0.109)	(0.221)	(0.078)	(0.083)	(0.111)
GDP growth	0.060	0.063**	0.023	−0.002	0.003	−0.011
	(0.052)	(0.027)	(0.038)	(0.018)	(0.013)	(0.018)
Pop growth	−0.953***	−0.577***	−0.468***	0.077	−0.103	−0.036
	(0.257)	(0.181)	(0.170)	(0.110)	(0.083)	(0.087)
Debt service	0.002	−0.110***	−0.127***	0.030	−0.013	−0.016
	(0.038)	(0.025)	(0.023)	(0.023)	(0.008)	(0.011)
Constant	2.879***	4.720***		2.660***	2.802***	
	(1.075)	(0.820)		(0.444)	(0.409)	
Observations	363	363	346	312	312	295
R-squared	0.397	0.230	0.114	0.333	0.186	0.167
Country FE	×	√	√	×	√	√
Number of countries	84	84	81	82	82	75
Cragg-Donald F-stat			17.18			8.153
Kleibergen-Paap F-stat			10.76			5.257
Kleibergen-Paap LM-stat			13.68			8.950
Hansen test (p-value)			0.671			0.831

Notes: (1) Robust standard errors are in parentheses. (2) *significant at 10%; **significant at 5%; ***significant at 1%. (3) OLS, ordinary least squares; FE, fixed-effects; IV/GMM2S, two-step efficient generalized method of moments estimator. GMM2S models are implemented in the xtivreg2 package for Stata. (4) Instrumental variables for models (3), (6), and (9) are share of agriculture in GDP and the share of natural resource rent in GDP. The first-stage F-tests (test of weak identification) is greater than 10 and Hansen J statistic (test of the over-identifying restrictions) fails to reject the hypothesis that the instrumental variables are exogenous. This indicate that the three instruments are sufficiently correlated with the potentially endogenous regressor (Fiscal capacity) and that they are not directly correlated with the dependent variable (Social expenditure). This suggests they are strong and valid instruments for Fiscal capacity.

Table A7. Impact of fiscal capacity and each of the four democratic-institution measures on social welfare outcomes. IV/GMM2S Estimate. (excluding grants from fiscal capacity).

Dependent variable	Social protection expenditure (% of GDP)				Expenditure on education (% of GDP)			
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total non-resource taxes to GDP ratio excluding grants	0.430***	0.439***	0.389***	0.449***	0.179**	0.185**	0.103	0.178**
	(0.139)	(0.141)	(0.136)	(0.141)	(0.082)	(0.085)	(0.085)	(0.082)
Military expenditure to GDP ratio	0.036	0.038	0.084	0.035	0.133	0.132	0.104	0.132
	(0.220)	(0.222)	(0.197)	(0.228)	(0.101)	(0.102)	(0.088)	(0.101)
GDP growth	0.041	0.042	0.033	0.043	0.009	0.009	0.013	0.009
	(0.028)	(0.029)	(0.027)	(0.029)	(0.025)	(0.024)	(0.023)	(0.024)
Pop growth	−0.381*	−0.351*	−0.404**	−0.338*	−0.068	−0.052	−0.126	−0.055
	(0.196)	(0.201)	(0.186)	(0.202)	(0.097)	(0.099)	(0.086)	(0.097)
Debt service to GNI ratio	−0.107***	−0.111***	−0.116***	−0.114***	−0.008	−0.011	−0.009	−0.010
	(0.022)	(0.022)	(0.022)	(0.022)	(0.013)	(0.013)	(0.012)	(0.012)
Electoral democracy	4.066***				1.868*			
	(1.366)				(0.969)			
Liberal democracy		4.600***				1.872		
		(1.551)				(1.155)		
Participatory democracy			7.073***				4.434***	
			(2.341)				(1.277)	
Deliberative democracy				2.712**				1.632**
				(1.288)				(0.811)
Observations	327	327	329	327	279	279	282	279
R-squared	0.209	0.199	0.255	0.175	0.089	0.078	0.205	0.092
Country FE	√	√	√	√	√	√	√	√
Number of countries	77	77	78	77	71	71	72	71
Cragg-Donald F-stat	15.63	15.74	14.61	15.83	9.860	10.08	7.396	9.767
Kleibergen-Paap F-stat	10.33	10.35	10.16	10.18	4.699	4.684	3.942	4.529
Kleibergen-Paap LM-stat	10.72	10.65	10.77	10.62	7.485	7.508	7.589	7.205
Hansen test (p-value)	0.769	0.795	0.428	0.831	0.352	0.360	0.188	0.364

Notes: (1) Robust standard errors are in parentheses. (2) *significant at 10%; ** significant at 5%; *** significant at 1%. (3) IV/ GMM2S, two-step efficient generalized method of moments estimator. GMM2S models are implemented in the xtivreg2 package for Stata. (4) Instrumental variables for models (3), (6), and (9) are share of agriculture in GDP and the share of natural resource rent in GDP. The first-stage F-tests (test of weak identification) is greater than 10 and Hansen J statistic (test of the over-identifying restrictions) fails to reject the hypothesis that the instrumental variables are exogenous. This indicate that the three instruments are sufficiently correlated with the potentially endogenous regressor (Fiscal Policy) and that they are not directly correlated with the dependent variable (Social expenditure). This suggests they are strong and valid instruments for Fiscal capacity

Table A8. Impact of fiscal capacity and each of the three inequality measures on social welfare outcomes. IV/GMM2S Estimate. (excluding grants from fiscal capacity).

Dependent variable	Social protection expenditure (% of GDP)			Expenditure on education (% of GDP)		
Independent variable	(1)	(2)	(3)	(4)	(5)	(6)
Total non-resource taxes to GDP ratio excluding grants	0.445***	0.523***	0.531***	0.171*	0.222***	0.225***
	(0.149)	(0.143)	(0.144)	(0.095)	(0.086)	(0.087)
Military expenditure to GDP ratio	0.036	−0.023	−0.017	0.126	0.118	0.120
	(0.222)	(0.265)	(0.266)	(0.099)	(0.108)	(0.109)
GDP growth	0.050	0.047	0.047	0.013	−0.002	−0.003
	(0.031)	(0.031)	(0.032)	(0.027)	(0.027)	(0.027)
Pop growth	−0.301	−0.280	−0.276	−0.050	−0.022	−0.020
	(0.215)	(0.206)	(0.207)	(0.097)	(0.098)	(0.099)
Debt service to GNI ratio	−0.119***	−0.107***	−0.107***	−0.014	−0.014	−0.014
	(0.023)	(0.024)	(0.025)	(0.012)	(0.012)	(0.012)
Egalitarian index	6.906**			4.026		
	(3.086)			(2.601)		
GINI		−0.019			−0.244	
		(3.986)			(2.169)	
Palma ratio			−0.057			−0.012
			(0.088)			(0.041)
Observations	329	339	339	282	290	290
R-squared	0.190	−0.028	−0.039	0.104	−0.018	−0.024
Country FE	√	√	√	√	√	√
Number of countries	78	80	80	72	74	74
Cragg-Donald F-stat	15.37	18.72	18.54	8.294	11.89	11.88
Kleibergen-Paap F-stat	11.03	12.56	12.80	4.242	5.963	6.087
Kleibergen-Paap LM-stat	10.56	12.35	12.23	7.327	9.310	9.313
Hansen test (p-value)	0.623	0.818	0.805	0.271	0.304	0.306

Notes: (1) Robust standard errors are in parentheses. (2) *significant at 10%; ** significant at 5%; *** significant at 1%. (3) IV/ GMM2S, two-step efficient generalized method of moments estimator. GMM2S models are implemented in the xtivreg2 package for Stata. (4) Instrumental variables for models (3), (6), and (9) are share of agriculture in GDP and the share of natural resource rent in GDP. The first-stage F-tests (test of weak identification) is greater than 10 and Hansen J statistic (test of the over-identifying restrictions) fails to reject the hypothesis that the instrumental variables are exogenous. This indicate that the three instruments are sufficiently correlated with the potentially endogenous regressor (Fiscal Policy) and that they are not directly correlated with the dependent variable (Social expenditure). This suggests they are strong and valid instruments for Fiscal capacity.

Table B1. List of variables, definitions and sources.

Name and definition	Source
Social protection expenditure is the sum of annual expenditure (including benefit expenditure and administration costs) of all existing public social security/ social protection schemes or programmes in the country. The scope of the indicators corresponds to the scope of the Social Security (Minimum Standards) Convention, 1952 (No.102), which established nine classes of benefits: medical care, sickness benefit, unemployment benefit, old-age benefit, employment injury benefit, family benefit, maternity benefit, invalidity benefit and survivors' benefit, plus other income support and assistance programmes, including conditional cash transfers, available to the poor and not included under the above classes. It includes public health expenditure as well. It is expressed as a share of GDP in national currency units, current prices.	ILO, *World Social Protection Report 2014/15*
Government expenditure on education as % of GDP is expressed as a percentage of GDP.	UNESCO, WDI
Fiscal capacity	UNU-WIDER Government Revenue Dataset 2019 https://www.
The main measure of fiscal capacity is total Non-resource Tax to GDP ratio. which consists of taxes, social security contributions, grants receivable, and other revenue mines resources taxes	wider.unu.edu/sites/default/files/Data/ICTDWIDERGRD_ 2019.xlsx
Military expenditure as a share of GDP	Stockholm International Peace Research Institute (SIPRI)
Polity 2 gives the combined autocracy and democracy score of between -10 and +10, with +10 being the best (democracy) and -10 the worst (autocracy).	Polity IV dataset: http://www.systemicpeace.org/inscrdata.html (accessed 1 December 2014)
Quality of government is an aggregation of mean value of the three variables; corruption, law and order, and bureaucracy quality scaled between 0 and 1. Higher values indicate higher quality of government. These three variables are originally generated by the ICRG dataset. The aggregate variable quality of government is constructed by the Quality of Government Standard Dataset 2016, Quality of Government Institute, University of Gothenburg, Sweden.	Dahlberg, S., S. Holmberg, B. Rothstein, A. Khomenko, and R. Svensson (2016). *The Quality of Government Basic Dataset*, version Jan16. University of Gothenburg: Quality of Government Institute, http://www.qog.pol.gu.se, doi:10.18157/QoGBasJan16
The V-DEM liberal democracy index has two components: the electoral democracy index and the liberal component index. The former is related to elections, the latter is concerned with constraints on the executive, human rights and equality before the law. The participatory component index is related to civil society engagement and the influence of sub-national governments. The egalitarian component index looks at equal protection, equal access and the equal distribution of resources.	https://www.v-dem.net/en/ https://www.v-dem.net/en/data/data-version-8 (last accessed 27 October 2019)
GINI coefficient of Estimated Household Income Inequality	the Global Consumption and Income Project (GCIP)
The Palma ratio is It is the share of income held by the top ten percent of the population divided by the share of the bottom forty percent.	
Debt service is total debt service is the sum of principal repayments and interest actually paid in currency, goods, or services on long-term debt, interest paid on short-term debt, and repayments (repurchases and charges) to the IMF. It is a percentage of GNI.	World Development Indicators (WDI), World Bank
Population growth	
Per capita income/GDP growth	
Share of agriculture in GDP	
Share of mineral resource rents in GDP	

Table B2. List of countries.

Country Name		
Afghanistan	El Salvador	Nepal
Albania	Ethiopia	Nicaragua
Algeria	Fiji	Niger
Argentina	Gambia, The	Pakistan
Armenia	Georgia	Panama
Azerbaijan	Ghana	Papua New Guinea
Bangladesh	Guatemala	Paraguay
Belarus	Guinea	Peru
Belize	Guinea-Bissau	Philippines
Benin	Guyana	Romania
Bolivia	Honduras	Rwanda
Bosnia and Herzegovina	India	Senegal
Botswana	Indonesia	Sierra Leone
Brazil	Jamaica	South Africa
Bulgaria	Jordan	Sri Lanka
Burkina Faso	Kenya	Sudan
Burundi	Kyrgyz Republic	Swaziland
Cambodia	Lao PDR	Syrian Arab Republic
Cameroon	Liberia	Tajikistan
Central African Republic	Madagascar	Tanzania
Chad	Malawi	Thailand
China	Malaysia	Togo
Colombia	Mauritania	Tunisia
Congo, Dem. Rep.	Mauritius	Turkey
Congo, Rep.	Mexico	Uganda
Costa Rica	Mongolia	Ukraine
Cote d'Ivoire	Morocco	Uzbekistan
Dominican Republic	Mozambique	Venezuela, RB
Ecuador	Myanmar	Vietnam
Egypt, Arab Rep.	Namibia	Zambia