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Reallocating Public Spending to Reduce Income Inequality: Can It Work?

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Abstract

Can a government reduce income inequality by changing the composition of public spending while keeping the total level of expenditure fixed? Using newly assembled data on spending composition for 83 countries across all income groups, this paper shows that reallocating spending toward social protection and infrastructure is associated with reduced income inequality, particularly when it is financed through cuts in defense spending. However, the political and security situation matters. The analysis does not find evidence that lowering defense spending to finance infrastructure and social outlays improves income distribution in countries with weak institutions and at higher risk of conflict. Reallocating social protection and infrastructure spending towards other types of spending tends to increase income inequality. Accounting for the long-term impact of health spending, and particularly education spending, helps to better capture the equalizing effects of these expenditures. The paper includes a discussion of the implications of the findings for Indonesia, a major emerging market where income inequality is at the center of policy issues.

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I. INTRODUCTION

Rising income inequality is at the forefront of the economic policy debate around the world. Increases in income inequality in advanced and developing economies in recent decades have been attributed to an array of factors, including skill-biased technological progress, technology diffusion, declining top marginal income tax rates, and the liberalization of factor and product markets (Woo and others 2017). Evidence from public surveys in various countries indicates that widening income inequality has been accompanied by growing public demand for income redistribution (IMF 2015). But what tools are at the disposal of governments for income redistribution?

A large and growing empirical literature identifies fiscal policy as a primary tool for governments to influence income distribution (IMF 2015, 2017). In general, a more progressive taxation system is expected to have equalizing effects on income distribution (Woo and others 2017). Direct taxes, especially personal income tax and to a lesser extent corporate income tax, tend to improve income distribution, while indirect taxes, including consumption taxes and custom duties, increase income inequality (Gemmell and Morrissey 2005; Cubero and Hollar 2010; Martinez-Vazquez, Moreno-Dodson, and Vulovic 2012). Many studies show that public spending, particularly in the form of social benefits, seems to have a higher redistributive impact than taxes (Martinez-Vazquez, Moreno-Dodson, and Vulovic 2012; Joumard, Pisu, and Bloch 2012; Paulus and others 2009; Chu, Davoodi, and Gupta 2004). A large body of literature analyzes the effects of government spending on income inequality. A survey by Anderson and others (2017) identifies 84 studies containing over 900 estimations. Overall, that meta-analysis shows some evidence of a moderate, negative relationship between government spending and income inequality, which is stronger for social welfare and other social spending.

This paper focuses on the effects of public spending on income inequality.² Unlike previous papers in the empirical literature that analyze the impact of various spending components on income inequality, this paper innovates by focusing on the benefits of spending reallocation. It assesses whether and how governments could reduce income inequality by changing the composition of public spending while keeping the total level of expenditure fixed. This question is particularly important for various reasons. First, high public debt and limited fiscal space in many advanced economies seem set to remain a lasting legacy of the global economic and financial crisis. Second, in many advanced economies, particularly in Europe, already-high spending levels combined with high taxation constrain the potential to address rising inequalities through additional spending increases. Third, many developing economies face significant challenges in realizing their tax revenue potential, limiting much-needed

² Governments have various objectives when undertaking public spending, including raising per capita income and providing social services. Income inequality is only one of these objectives. This paper focuses on the distributional impact of public spending composition because this important issue has not received due consideration in the literature.

fiscal space for growth-enhancing and social spending. The lackluster performance in many developing countries' tax revenue mobilization is a result of various factors, including high informality and limited institutional capacity, which appear difficult to overcome overnight. Given the constraints in raising taxes and increasing spending, reallocating public spending within a fixed overall envelope may provide a way out to tackle rising inequality. Can this work?

Using newly assembled data on disaggregated public spending for 83 countries across all income groups, the results show that reallocating spending toward social protection and infrastructure is associated with lower income inequality, particularly when it is financed through cuts in defense spending. This result is only valid in countries with low risks of conflict and strong institutions. In countries with a high risk of conflict and weak institutions, the analysis does not find evidence that cutting defense spending to finance infrastructure and social outlays improves income distribution. Accounting for the long-term impact of education and spending helps to better capture their impact on inequality. After accounting for that long-term impact, it is shown that financing higher health spending and, in particular, education spending, through cuts in defense spending is also associated with lower income inequality. Reallocating social protection and infrastructure spending towards other types of spending tends to increase income inequality. The results are confirmed by additional robustness checks to account for (1) alternative measures of income inequality; (2) spending of local governments; (3) the efficiency of public spending; (4) the impact of debt-financed public spending; and (5) potential differences between advanced and emerging economies.

The rest of the paper is organized as follows. Section II of this paper describes the new dataset on the composition of public spending and discusses a few stylized facts on public spending and income inequality. Section III presents the empirical strategy and discusses the results as well as a few robustness checks. Section IV presents a case study on Indonesia. The final section provides some concluding remarks.

II. DATA

A. Composition of Public Spending: A New Dataset

This paper uses a newly assembled dataset on the composition of public spending by Acosta-Ormaechea and Morozumi (2017). The dataset relies on the IMF's *Government Finance Statistics Yearbook*, which presents public expenditure according to an economic and functional classification. The paper focuses on the functional classification, which is more relevant for the empirical question at hand.³ Between the mid-1990s and early 2000s, the IMF introduced a new classification for its government finance statistics, the 2001

³ In addition, much less data are available under the economic classification (wages, subsidies, social benefits, and capital spending), drastically reducing the size of the sample for an empirical study.

Government Finance Statistics Manual (GFSM2001).⁴ Categories of spending under this new classification are not fully comparable with the previous classification, the *1986 Government Finance Statistics Manual* (GFSM1986) for various reasons. First, GFSM1986 classifies government spending into 14 categories, while GFSM2001 has only 10 categories. Second, GFSM1986 reporting is only on a cash basis while GFSM2001 reporting is mainly on an accrual basis.⁵ More importantly, under GFSM2001, some countries combine the two accounting principles for different spending subcategories within a single year. These have been perennial challenges in the construction of long time series' on spending composition. Acosta-Ormaechea and Morozumi (2017) bridge the methodological changes associated with the introduction of the GFSM2001 to create consistent and comparable spending series' from 1970 to 2011.

Because of limited data availability for some spending categories, the new dataset does not cover all 10 spending components present in GFSM2001. The dataset focuses on the main expenditure categories identified in the literature and is comprised of the following five components: defense, transport and communication, health, education, and social protection.⁶ The dataset covers consolidated spending at the central government level.⁷ In the remainder of this paper, transport and communication will be referred to as a proxy for infrastructure spending.

B. Some Stylized Facts on Public Spending and Income Distribution

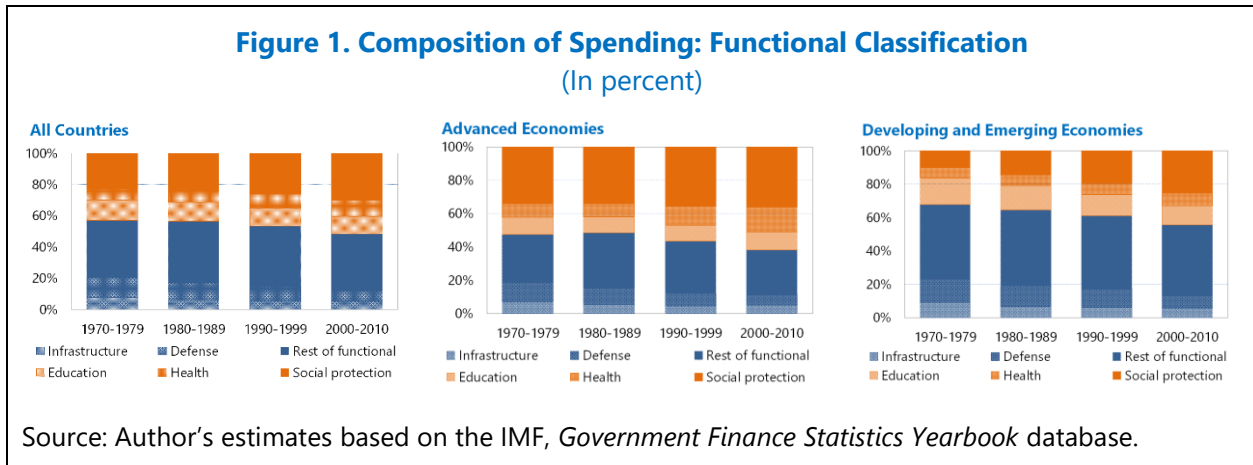
Figure 1 describes the evolution of spending composition. Over 2000–10, advanced and developing economies experienced a decline in the share of infrastructure and defense spending while the share of health spending increased in both groups. The share of social protection spending remained flat in advanced economies but increased in developing countries.

⁴ The year of introduction of GFSM2001 differs by country.

⁵ Accrual flows are recorded when transactions accrue, regardless of the time of payment, while cash accounting records transactions when payments are made.

⁶ The remaining components include general public services, housing and community amenities, fuel and energy, public order and safety, and environmental protection.

⁷ Beyond data availability issues, this level of aggregation is more relevant for this study, as defense spending and to some extent infrastructure spending are mostly at the central government level. The robustness of the results to the use of general government data will be discussed later in the paper.



This paper uses the Gini coefficient from the Standardized World Income Inequality Database (SWIID). This dataset has the advantage of maximizing comparability of income inequality data while preserving the broadest possible coverage across countries and over time. The paper focuses mainly on the net Gini, which captures inequality in disposable income (post-tax and post-transfer).⁸

An initial look at the data suggests a slight negative correlation between progressive taxation and the Gini coefficients. Overall, higher public spending seems associated with lower income inequality. Looking at the composition of spending, only social protection spending seems associated with lower income inequality, while higher defense spending is associated with increased income inequality (Figure 2).

III. ECONOMETRIC ANALYSIS: COMPOSITION OF PUBLIC SPENDING AND INCOME INEQUALITY

A. Estimated Model

The analysis builds on the large empirical literature on the determinants of income inequality, which finds that income per capita, education, trade openness, and technological change are the main determinants of cross-country variations in income inequality (Barro 2008; Woo and others 2017). While controlling for standard explanatory variables, the paper innovates by assessing the effects of spending reallocation on income inequality.

⁸ The robustness check section of this paper uses an alternative measure: inequality in market income (pre-tax, pre-transfer) from the SWIID.

The formal baseline regression specification is as follows:

$$\text{Log}(I_{it}) = \sum_{j=1}^n \delta_j S_{i,j,t-1} + \beta E_{i,t-1} + \gamma Z_{it-1} + \nu_i + \eta_t + \varepsilon_i, \quad (1)$$

where $\text{Log}(I_{it})$ denotes the logarithm of the disposable income Gini coefficient for country i and year t . $S_{i,j,t-1}$ captures the share of public spending component j in total spending. $\beta E_{i,t-1}$ represents the ratio of total spending in percent of GDP. Introducing this variable allows for isolating the effects of spending composition (Devarajan, Swaroop, and Zou 1996). Z_{it-1} is a vector of control variables. The one-year lag of all explanatory variables is used to reduce the risk of reverse causation. ν_i denotes the country-specific fixed effects (to control for country-specific factors including the time-invariant component of the institutional environment); η_t are the time-fixed effects (to control for global factors); and ε_{it} is an error term.⁹ By

construction, $\sum_{j=1}^n \delta_j S_{i,j,t-1} = 1$. This implies that including all spending components in one regression leads to perfect multicollinearity.

Similar to Acosta-Ormaechea and Morozumi (2017), this paper omits one spending component from the empirical equation to estimate it. Assuming that component c is omitted from the empirical equation, the specification excludes $S_{i,c,t-1}$ and becomes:

$$\text{Log}(I_{it}) = \sum_{j=1}^{n-1} (\delta_j - \delta_c) S_{i,j,t-1} + \beta E_{i,t-1} + \gamma Z_{it-1} + \delta_c + \nu_i + \eta_t + \varepsilon_i. \quad (2)$$

The marginal effect of $S_{i,j,t-1}$ is thus given by $\frac{\partial \text{Log}(I_{it})}{\partial S_{i,j,t-1}} = (\delta_j - \delta_c)$. It reflects the difference of marginal effects of spending components j and c and captures the marginal effect on income inequality of spending reallocation from component c to component j . Spending component c will be referred to as the financing component.

The main approach used here is to estimate the panel regression using the fixed-effects panel regression with Driscoll-Kraay standard errors, which are robust to very general forms of cross-sectional and temporal dependence. The error structure is assumed to be heteroskedastic, auto-correlated up to one lag (to account for the persistence of income inequality), and correlated between the panels (that is, countries), possibly due to common shocks, such as international trade.

Table I.1 in Appendix 1 describes all the data used in the regressions.

⁹ By introducing country-specific fixed effects, the average within-country impact is estimated. This impact could be considered as a lower bound, and more robust estimates, as between-country differences, could also play a role in the context of the analysis.

This section briefly discusses the theoretical and expected impact of each variable included in the empirical model. Z_{it-1} , the vector of control variables, includes:¹⁰

- **Income per capita**, which is captured by the logarithm of per capita GDP and its squared term to capture a potential Kuznets curve hypothesis. Under this hypothesis, inequality is expected to exhibit an inverted U-curve as an economy develops. In the initial stage of development, the structural transformation that implies shifts from agriculture to industry and services and adoption of new technologies benefits only a small segment of the population, leading to a rise of inequality. Over time, a larger share of the population, and eventually the majority, finds employment in the high-income sector, leading to a decline in income inequality. However, the existing evidence for the Kuznets curve is mixed (Woo and others 2017; Barro 2008; Kanbur 2000).
- **Human capital**, which is an index for education based on the average years of schooling from Barro and Lee (2013). It is interpolated for annual data and adjusted to account for higher returns to education for earlier years (Inklaar and Timmer 2013). The theoretical relationship between education and income inequality remains ambiguous because of two possible conflicting effects (Knight and Sabot 1983): (1) the “composition” effect, which predicts inequality to rise initially as the relative size of the educated population increases from a small base and subsequently declines as the share of the educated group expands; and (2) the “wage compression” effect, which predicts a decline of the education premium as the relative supply of educated workers increases, thereby decreasing income inequality. The human capital index used here puts a larger weight on basic education, which is more widespread across countries, and as such a negative relationship is expected between this index and income inequality, consistent with many studies in the literature (De Gregorio and Lee 2002; Woo and others 2017).
- **Trade openness**, which is captured by the sum of exports and imports over GDP and is a proxy for globalization. Standard international trade theory predicts that the impact of trade openness on income inequality would depend on countries’ relative factor endowments. Developed countries, which enjoy a relatively larger endowment in capital (and relative labor scarcity), would experience a rise in the relative return to capital and greater income inequality.¹¹ In contrast, developing countries, which enjoy a relatively larger endowment in labor (and relative capital scarcity), would experience lower income inequality (Stolper and Samuelson 1941). While a number of papers show that trade openness tends to be associated with lower income inequality (see the October 2007 *World Economic Outlook*; see also Woo and others 2017), overall the literature has been

¹⁰ These control variables are in line with those used in the empirical literature (Woo and others 2017).

¹¹ While trade openness is expected to exert downward pressure on the wages of low-skilled workers and increase inequality in advanced economies, it could have a positive impact on investment and growth. By improving overall income, higher growth may enable low-skilled workers to upgrade their skills and invest in entrepreneurial activities, improving income distribution over the longer term.

inconclusive (Krugman 2008; Meschi and Vivarelli 2007). Extensions of the theoretical predictions suggest increased competition (Birdsall 1998), incentives to up-skill (Blanchard and Giavazzi 2003), and specialization (Francois and Nelson 2003) as possible channels through which trade could reduce income inequality.

- **Technological progress**, which is measured by the share of information technology capital in the total capital stock and is a proxy for skill-biased technological progress (Jorgenson and Vu 2011). Most of the literature has identified skill-biased technological progress as one of the main drivers of rising income inequality in recent decades (see the October 2007 *World Economic Outlook*; see also Autor, Katz, and Krueger 1998, and Acemoglu 2003).
- **Unemployment**, which is captured by the unemployment rate and is expected to be associated with greater income inequality as a greater share of unemployed and inactive workers tends to be present in the bottom quintile of the income distribution (Martinez, Ayala, and Ruiz-Huerta 2001).
- **Inflation**, which is measured by the change in the Consumer Price Index and tends to disproportionately hurt the poor compared to other income groups and worsen inequality through various channels. The fraction of household wealth held in liquid assets, such as currency, decreases with income and wealth, leading to a transfer of wealth from the poorest to the richest through inflation and an increase of inequality (Erosa and Ventura 2002; Albanesi 2007). As wages tend to lag inflation, the latter could lead to a shift of income from wage-earners to profit-makers and an increase of income inequality (Laidler and Parkin 1975; Fischer and Modigliani 1978).
- **Public spending**, which is captured by total spending in percent of GDP and is a proxy for the size of the government. Because larger governments tend to be associated with larger distributional policies, including larger in-kind benefits, high public spending would be associated with lower income inequality (Fournier and Johansson 2016). While the size of the government is a public-choice issue, its composition is more subject to policy discussion and changes. The empirical literature also emphasizes that what matters more for the distributional impact of fiscal policy is its composition (Clements and others 2015). The next section discusses the potential impact of various categories of spending.

The variables of interest, $S_{i,j}$, capture the share of public spending component j in total spending and are comprised of the following:

- **Defense spending**. Military spending may impact income inequality through various channels. First, by competing for scarce resources with other social entitlements, higher military spending could come at the expense of social programs deemed more equalizing and lead to an increase in income inequality (Ali 2004). Second, because of high wages

in high-skilled, defense-related industries, a rise in defense spending would put pressure on wages in this sector, aggravate the wage gap with other industries, and increase income inequality (Ali 2007; Meng, Lucyshyn, and Li 2015).¹²

- **Infrastructure spending.** By expanding geographic access, improving transportation opportunities, and easing information flows, infrastructure development enhances labor mobility. It can help disadvantaged individuals gain access to productive opportunities by connecting them to core economic activities (Calderon and Serven 2004; Fan and Zhang 2004). However, better-endowed locations (in terms of human and private capital) may have higher returns on infrastructure spending because of the complementarity of such spending with private capital, leading to a widening of income and wealth gaps. Evidence from the literature on the impact of infrastructure on income inequality is sparse and largely inconclusive (Chatterjee and Turnovsky 2012; Mendoza 2017).¹³
- **Education spending.** Higher public spending in education has long been promoted with the expectation that expanding access to education enhances upward social mobility by making lower-income individuals more productive and better able to compete for higher-paying jobs associated with higher degrees (Becker 1964). Public intervention in the form of spending is particularly important when lower-income individuals lack adequate access to credit, which may undermine their ability to afford getting an education. An expansion of the number of graduates also reduces the skill gap and the associated wage gap, eventually making income distribution more equal (Kuznets 1955).¹⁴ However, going as far back as Tanzi (1974), there has also been wide recognition that the difficulty of accurately targeting regular education spending to the poor has made this spending less effective in reducing inequality. In some cases, such spending could actually worsen inequality. Among other reasons, the benefits of government spending, including education programs, are often captured by the urban middle class for political economy reasons, potentially worsening income inequality (Hausmann and Rigobon 1993; Alesina 1998; Schwartz and Ter-Minassian 2000).
- **Health spending.** Similar to education spending, health spending can enhance productivity through higher human capital accumulation (Grossman 1972). Public intervention in this sector is also important to reduce gaps in access, but similar targeting

¹² The military also absorbs a sizable low-skilled, low-wage labor force. To the extent that the increase in military spending leads to higher wages for the low-skilled, low-wage labor force, it may be associated with lower income inequality through a reduction of the wage gap (Ali 2007; Meng, Lucyshyn, and Li 2015).

¹³ For instance, Mendoza (2017) shows that wastewater treatment, domestic waste management, public green spaces, water efficiency, and residential power efficiency infrastructure are negatively correlated with income inequality, while increases in mass transit, water supply coverage, and Internet access infrastructure are positively correlated with income inequality.

¹⁴ The political economy argument sees the merits of education beyond earnings, but also as a tool to boost citizen participation in the democratic process and eventually influence policy choices (Ganimian and Solano Rocha 2011).

issues (as for education spending) may lead to a capture of the benefits of public health spending by the middle class, minimizing its impact on inequality or even worsening it (Alesina 1998; Schwartz and Ter-Minassian 2000).

- **Social protection spending.** Social protection spending includes housing benefits, family-related benefits, and unemployment benefits, which by their very nature are mostly aimed at supporting lower-income or vulnerable individuals. As such, one should expect that social protection spending reduces income inequality, at least in the first round (Whiteford 2008; Anderson and others 2017). However, social protection spending can be associated with second-order effects by creating some disincentives to work and subsequently increasing market income inequality. For instance, family-related benefits are often expected to reduce the labor supply of second earners, and relatively generous unemployment benefits lower financial incentives to work and can cause unemployment traps (Niehues 2010). In sum, it is expected that social protection spending would reduce net income inequality, but the impact on market income inequality is ambiguous.

B. Baseline Results

The results show that overall, higher public spending is associated with lower inequality of disposable income (Table 1). A 1 percentage point increase in the total-spending-to-GDP ratio is associated with a decline of net income inequality of 0.8 to 1 percent (Table 1, columns 1–10). Social protection and infrastructure spending are associated with lower income inequality, while the opposite is the case for defense and health spending. A 1 percentage point increase in social protection spending is associated with a reduction of the disposable income Gini coefficient by about 0.3 percent in (Table 1, columns 4 and 9). A 1 percentage point increase in infrastructure spending is associated with a decline of disposable income Gini coefficient by about 0.8 percent (Table 1, columns 3 and 8). On the other hand, 1 percent increases in defense and health spending are associated with increases in income inequality of 0.6 percent (column 2) and 0.5 percent, respectively (column 5).¹⁵

Reallocating spending toward social protection and infrastructure is associated with much lower income inequality when it is financed through cuts in defense and health spending (Tables 2–6). More specifically, a 1 percentage point increase in social spending financed by a corresponding cut in defense spending is associated with a 0.5 percent reduction in inequality. A 1 percentage point rise in infrastructure spending financed by a corresponding cut in defense spending is associated with a 0.9 percent reduction in inequality. The Gini coefficient is quite inelastic. To put the results in perspective, the Gini coefficient has increased by 5.6 percent per year on average between 1970 and 2010 in the sample. That

¹⁵ The possibility that improvements in human capital can be a channel through which higher education and health spending affect income inequality is also assessed. The main results are robust to the exclusion of the human capital variable, not supporting the transmission channel hypothesis.

means that spending reallocation from defense toward social protection and infrastructure could have offset about one-fourth of the increase in the Gini coefficient.

Reducing education spending is associated with lower income inequality only when the available is used to finance higher infrastructure investment. Reallocating social protection and infrastructure spending towards other types of spending tends to increase income inequality. Consistent with most of the empirical literature, education and trade openness are significantly associated with lower inequality, while technological progress, unemployment, and inflation are associated with increased income inequality. The signs of the coefficient seem to suggest an inverse U-shaped relationship between income per capita and inequality, but the coefficients are not significant. Introducing an indicator to capture the progressivity of the tax system does not impact the main results but does suggest that progressive taxation is associated with lower income inequality, consistent with the literature.

C. The Role of Conflict and Institutions

A key finding from the section above is that higher defense spending is associated with higher inequality, and that cutting defense spending to finance higher infrastructure and social outlays is associated with lower income inequality. This suggests that countries may be better off reallocating military expenditure to more equalizing social and infrastructure spending. Is this valid for all countries regardless of their political fragility and the quality of their institutions? Are countries with relatively fragile institutions and high risk of conflict still better off redirecting spending from defense to social protection and infrastructure?

To assess the above questions, the empirical equation (equation 2) is extended to include a variable capturing countries' quality of institutions or risk of conflict and its cross terms with the variable of interest (social or infrastructure spending financed through cuts in defense spending). For this purpose, the empirical model becomes:

$$\begin{aligned} \text{Log}(I_{it}) = & \sum_{j=1}^{n-1} (\delta_j - \delta_c) S_{i,j,t-1} + \sum_{j=1}^{n-1} (\omega_j - \omega_c) S_{i,j,t-1} * G_{i,t-1} \\ & + \beta E_{i,t-1} + \gamma Z_{i,t-1} + \zeta G_{i,t-1} + \delta_c + v_i + \eta_t + \varepsilon_{it}, \end{aligned} \quad (3)$$

where $G_{i,t-1}$ represents the indicators of governance or risk of conflict. All other variables remain as in equation 1. The marginal effect of $S_{i,j,t-1}$ is thus given in this case by $\frac{\partial \text{Log}(I_{it})}{\partial S_{i,j,t-1}} = (\delta_j - \delta_c) + (\omega_j - \omega_c) G_{i,t-1}$. As previously, this marginal effect captures the effect of spending reallocation to component j from component c , as a function of the quality of institutions or risk of conflict. In this section component j is social and infrastructure spending and component c is defense spending.

Six indicators from the International Country Risk Guide (ICRG) are used to capture political risk: bureaucracy quality; corruption; democratic accountability; external conflict, internal conflict; and law and order. A higher value for each indicator reflects a lower risk.¹⁶

Figures 3–5 illustrate the results. Analyzing first the impact of cuts in defense spending regardless of the use of the released resources (Figure 3) highlights that reducing defense spending is associated with lower inequality only when institutions are strong, and the risk of political instability is low. In countries with weak institutions and higher risks of conflict, defense spending does not appear disequalizing. Financing higher social and infrastructure spending through cuts in defense spending is associated with lower income inequality only in countries with the lowest risks of conflict and strong institutions (Figures 4 and 5). In these countries, the results illustrate that in the presence of resource constraints, countries can effectively substitute some defense spending with more equalizing outlays such as those for infrastructure, education, and health to reduce income inequality. In countries with higher risks of conflict, no evidence is found that lowering defense spending to finance infrastructure and social outlays is equalizing.¹⁷ This finding may reflect the fact that conflicts and political instability tend to disproportionately hurt the poor and less fortunate (Bircan, Brück, and Vothknecht 2010).

D. Further Robustness Checks

Long-Run Impact of Public Spending

The analysis so far has focused on the short-term impact of spending composition using annual data with one-year lags for the explanatory variables in order to reduce the risk of

¹⁶ (1) Bureaucracy quality, with a score between 0 and 4, captures the quality of the bureaucracy. In countries with the highest risk (low score), a change in government tends to be traumatic in terms of policy formulation and day-to-day administrative functions. (2) Corruption, with a score between 0 and 6, captures issues such as patronage and nepotism that can lead to a popular backlash, resulting in a fall or overthrow of the government, a major reorganizing or restructuring of the country's political institutions, or, at worst, a breakdown in law and order, rendering the country ungovernable. (3) Democratic accountability, with a score between 0 and 6, measures how responsive the government is to its people. The lowest risk is assigned to alternating democracies, while the highest risk is assigned to autarchies. (4) External conflict, with a score between 0 and 12, assesses the risk to the incumbent government from foreign action, ranging from nonviolent external pressure (diplomatic pressures, withholding of aid, trade restrictions, territorial disputes, sanctions, etc.) to violent external pressure (ranging from cross-border conflicts to all-out war). (5) Internal conflict assesses political violence, with a score ranging from 0 to 12. Countries embroiled in an ongoing civil war have the highest risk, while the government in countries with low risk does not indulge in arbitrary violence against its people. (6) Law and order, with a score between 0 and 6, assesses the strength and impartiality of the legal system and the popular observance of the law. A very high crime rate if the law is routinely ignored without effective sanction (for example, widespread illegal strikes) implies the highest risks.

¹⁷ Using the median value to split the sample into countries with stronger institutions (above the median value) and countries with weaker institutions (below the median value) confirms that financing higher social and infrastructure spending through cuts in defense spending is associated with lower income inequality only in countries with stronger institutions (Table 7).

reverse causality. Various studies in the literature on the impact of public spending on income inequality argue that spending in such areas as health, and particularly, education, may affect income inequality only after a fairly long-time lag (Chu, Davoodi, and Gupta 2000; Bastagli, Coady, and Gupta 2012, 2015).

The potential long-run impact of public spending is taken into account here by adopting a 10-year framework that assesses the impact of public spending in $t-1$ (as in the initial framework) on income inequality during the following 10 years (t to $t+9$).¹⁸ Formally, the measure of inequality $Log(I_{it})$ is replaced with the average level of inequality between t and $t+9$ ($\overline{Log(I)}_{i,t \text{ to } t+9}$).

The 10-year framework has many advantages. The first and most important one is its suitability to better capture the full effect of specific spending such as education outlays. The second advantage is a better robustness to reverse causality, as it is unlikely that governments would change the composition of their spending in anticipation of rising income inequality over the next 10 years.¹⁹ Lastly, using averages would slightly help reduce missing data from the inequality data.

The results confirm that increasing social and infrastructure spending through cuts in defense spending is associated with reduced income inequality. Unlike in the annual framework, accounting for the long-run impact of education spending confirms the expected results. When accounting for its long-term impact, higher education spending financed through cuts in defense spending is associated with lower income inequality (Table 8). Similar results, though not significant, are also found for health spending.

Alternative Indicators of Inequality

As additional robustness checks, alternative data and indicators to capture income inequality are used. Alternative measures of income inequality are highly correlated, with correlation coefficients significant at 1 percent (Appendix 2). Using the change in the disposable income Gini as an alternative indicator of inequality confirms the main results (Table 11). The main measure of income inequality in this paper—the Gini coefficient after taxes and transfers from the SWIID dataset—can be complemented with the market Gini from the same dataset. Beyond their direct impact on disposable income Gini, public spending policies can also have second-round effects on household market (pre-fiscal) income. Education spending is a good

¹⁸ Bleaney, Gemmell, and Kneller (2001) show that eight-year annual lags are required to fully account for the long-run effects of fiscal policy on growth. The eight-year framework is also validated by Acosta-Ormaechea and Morozumi (2017). The main results are robust when considering an eight-year or five-year framework (see Tables 9 and 10). However, the 10-year framework does a better job of highlighting the long-run impact of education spending on disposable income inequality.

¹⁹ While the use of the system generalized method of moments does not change the main results, we have found it challenging to confirm the quality of our internal instruments.

example, as it may impact inequality of opportunities and market income. As predictable, fiscal policy has a limited impact on market income inequality, except for health spending (Table 12).²⁰

Accounting for Local Government Spending, the Efficiency of Public Spending, and the Use of Debt to Finance Public Outlays²¹

In many countries, the decentralization process has led to a higher share of public goods being delivered by local authorities, particularly in education and health. To account for the potential impact of decentralization, this paper assesses the robustness of the main results to the use of consolidated general government data, which include spending at the local government level.²² The results (Table 13) confirm that education, health, and social spending are associated with lower income inequality, particularly when they are financed through cuts in defense spending. Interestingly, accounting for local government spending helps to better capture the equalizing effect of public spending, particularly health outlays.

The inefficiencies with which public spending is turned into productive physical capital can undermine the equalizing effect of public outlays. For instance, in the literature on public investment and growth, Gupta and others (2014) show that not accounting for inefficiencies in public investment can lead to an underestimation of their impact on growth. Using the Public Investment Management Assessment (PIMA) overall index, which captures various dimensions of the public investment management cycle, the robustness of the results of the present paper can be assessed, with particular attention given to the infrastructure component.²³ The results confirm the prior: the equalizing impact of infrastructure spending increases with the efficiency of capital spending (Table 14).

A key assumption in this paper is to keep the level of total public spending fixed and assess the impact of a reallocation of public outlays from one category to the other. As such, the

²⁰ The results with market income Gini are similar even after accounting for the potential long-term effects of public spending. Using the difference between the market Gini and the disposable income Gini, which captures the extent of redistribution through fiscal policy also confirms the main results. While the use of alternative data sources (the Luxembourg Income Study) and indicators (top and bottom income share) of inequality reduce markedly the size of the sample, they confirm the main results. These results, not presented for brevity, are available upon request.

²¹ We confirm the main results for advanced and developing countries separately, though the impact is more precisely estimated in developing countries (Table 16). Table I.2 provides the list of countries in the analysis.

²² General government data are much scarcer than central government data. For instance, beyond a smaller sample size, the data used here do not allow for separately identifying infrastructure spending for the general government.

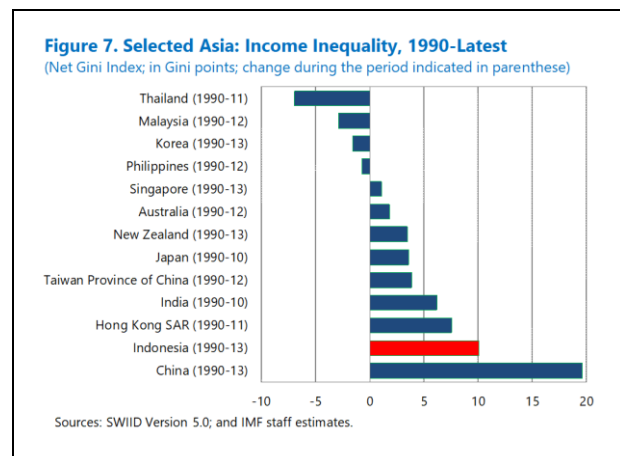
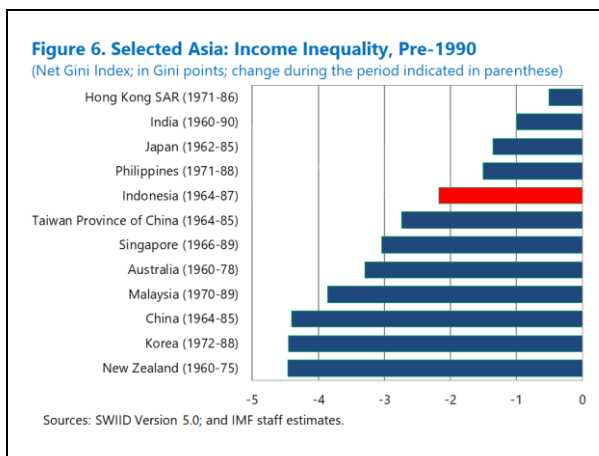
²³ The PIMA index is composed of 15 indicators grouped into three stages of the public investment management cycle: (1) planning; (2) allocation; and (3) implementation (IMF 2015). Countries are scored based on different indicators, which are then combined to construct the overall index. IMF (2015) and the November 2016 *Regional Economic Outlook: Central, Eastern, and Southeastern Europe* provide details of the PIMA assessment, covered areas, and indicators.

exercise does not involve any increase in debt. That said, could the prevailing level of debt affect the equalizing effect of public spending? The results illustrate that while public debt slightly reduces the equalizing effect of public spending on infrastructure, social assistance, health, and education, the main results remain valid—that is, higher public spending, particularly on infrastructure and social assistance, is associated with lower income inequality (Table 15).

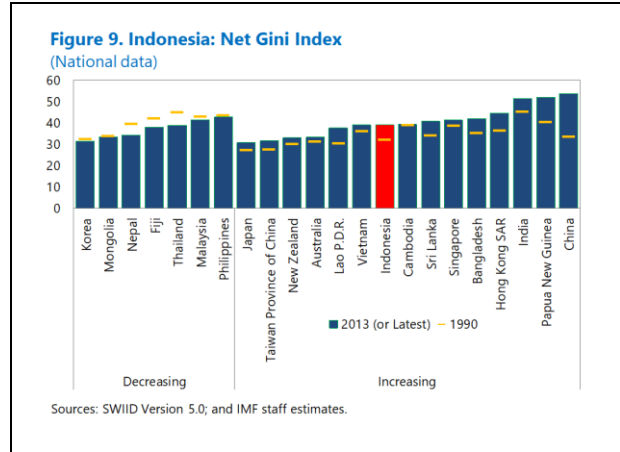
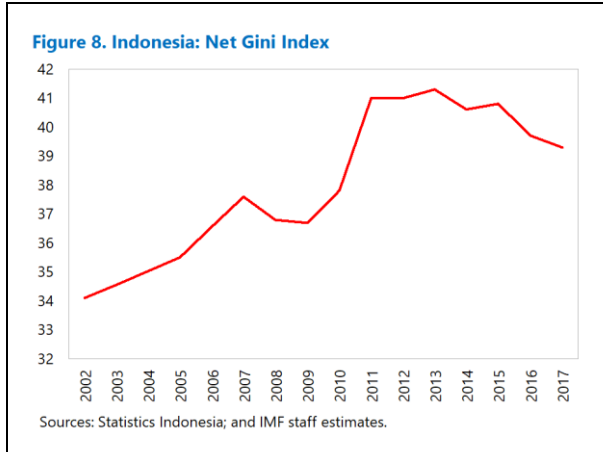
IV. CASE STUDY: TACKLING INEQUALITY IN INDONESIA

A. Trends in Inequality

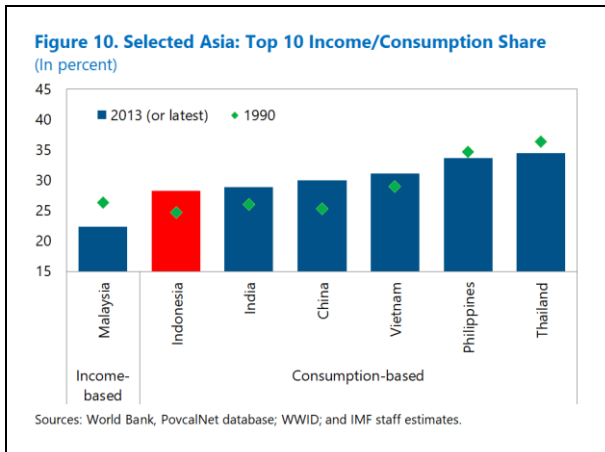
Prior to 1990, Asian economies grew strongly and made significant progress in reducing poverty (Jain-Chandra and others 2016). During this period, income inequality was also reduced significantly (Figure 6). Since then, however, the region has been unable to replicate the “growth with equity miracle.” While remarkably high growth since 1990 has led to large gains in poverty alleviation, income inequality has risen in many Asian economies, particularly in large emerging markets (Figure 7).



In Indonesia, robust average growth of 5 percent between the early 1990s and 2017 led to a sharp decline in poverty. Inequality, captured by the Gini coefficient, increased by about 7 points between the early 1990s and 2013, before declining by 2 points through 2017 (Figure 8). From a cross-country perspective, Inequality in Indonesia remains on par with the levels in other major Asian emerging economies (Figure 9).



Rising inequality in Indonesia has also been driven to some extent by increases in the income share of the top decile, consistent with global trends. In 2013, the top decile of the population accounted for 28 percent of total consumption, up from less than 25 percent in 1990 (Figure 10). Looking at a broader measure of resources—wealth—confirms the gap between the richest and the rest. The wealthiest 1 percent of the population owned nearly half (45 percent) of total wealth.



B. Inequality of Opportunities

In addition to inequality of outcomes such as income and wealth, Indonesia also faces inequality of opportunities, including access to health, education, financial services, and quality jobs. These aspects of inequality are particularly important because they sow the seeds for wider income gaps in the future and tend to delink economic outcomes from individuals' efforts (Jain-Chandra and others 2016).

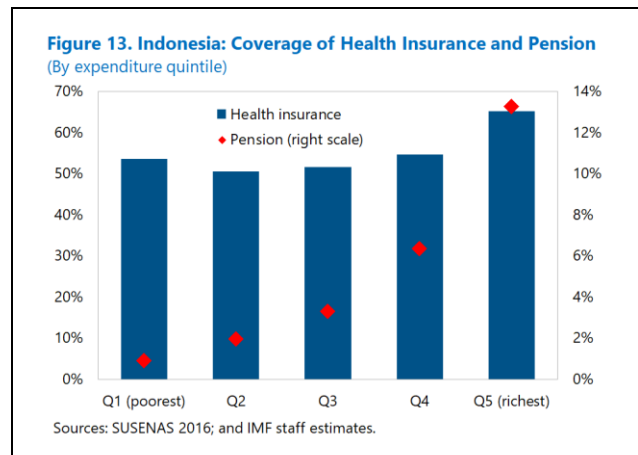
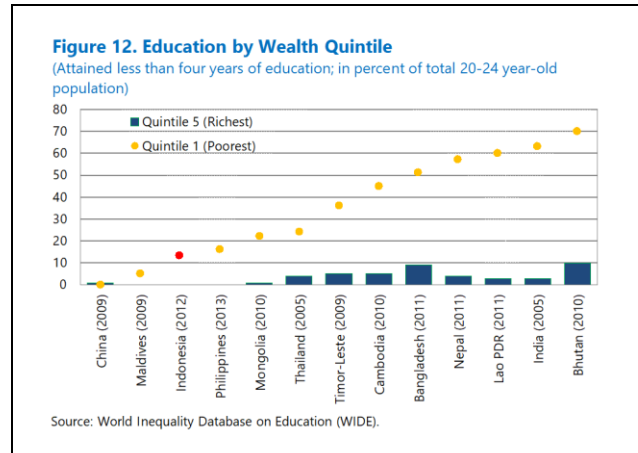
Education

While the gap in educational attainments between the wealthiest and the poorest quintiles of the income distribution is modest in Indonesia compared to many developing economies in Asia, the percentage of people with less than four years of schooling is still higher for the poorest quintile than for the richest quintile (Figure 12). Free primary and lower secondary education has supported close to universal enrollment across all income groups, but gaps remain in upper secondary and tertiary education, where poor households have lower enrollment rates (Jin 2018). There are also disparities in education quality across regions, with the eastern parts of Indonesia lagging further behind.

Health and Social Benefits

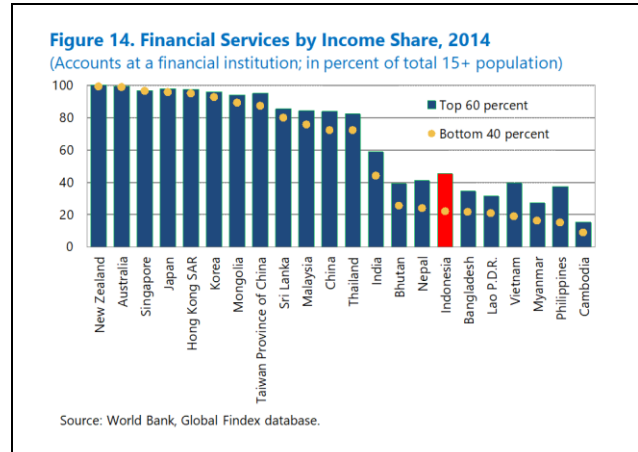
Efforts to subsidize poor households' health insurance premiums in Indonesia have led to broadly similar health insurance coverage across income groups.

However, there is inequality in access to health services across regions—only 28 percent of villages in the poor regions of Maluku and Papua have health centers, compared with the national average of 38 percent (World Bank 2016; Jin 2018). Access to pensions is also unequal, with the poorest households having essentially no access to any pension benefits, compared to more than 60 percent of the richest households having some access to pension benefits (Figure 13).



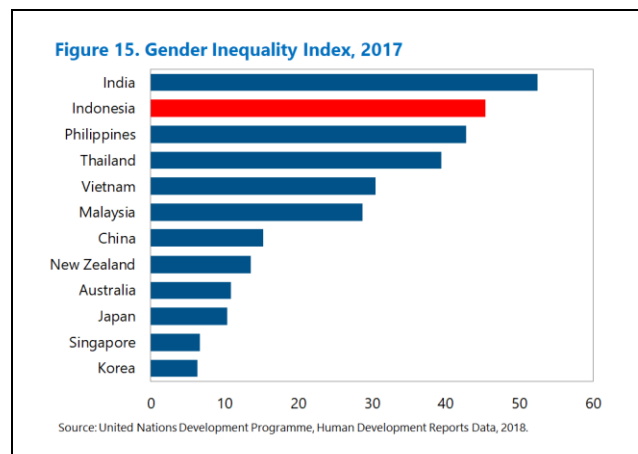
Financial Services

Adults in Indonesia have less access to financial services overall compared to individuals in peer countries. In addition, the share of adults with a bank account in Indonesia is higher in the top 60 percent of the income distribution than in the bottom 40 percent (Figure 14). By constraining the ability of people (particularly low-income individuals) to borrow for investment and to finance education, the lack of adequate financial services can create and perpetuate income inequality.



Labor Markets and Gender

Many countries in Asia face different forms of duality in their labor markets that can exacerbate income inequality. In Indonesia, informality is an important driver of dual labor markets, with the share of informality in nonagricultural employment above 70 percent. In addition, despite a recent decline, gender disparity in labor participation continues to persist. The female labor force participation rate improved from 48 percent in 2005 to 51 percent in 2017, but it remains lower than the 83 percent labor force participation rate for men. From a cross-country perspective, gender inequality remains relatively high in Indonesia (Figure 15).



C. Implications of the Empirical Results for Indonesia and Policy Suggestions

Inequality in Indonesia is a source of concern for at least two reasons. First, the recent literature has found that elevated levels of inequality are harmful for the pace and sustainability of growth. In particular, high levels of income inequality can lead to suboptimal investment in health and education, which weighs on growth. Also, widening inequality can weaken support for growth-enhancing reforms and may spur governments to adopt populist policies and increase the risk of political instability. Second, increases in inequality in Asia have had a dampening effect on the impact of growth on poverty reduction, leading to less-inclusive and less-pro-poor growth (Jain-Chandra and others 2016).

Recognizing this, Indonesian authorities have placed inclusive growth as central to their national development plans and have enjoyed some early successes, as income inequality has

declined since 2013, partially reversing early increases. For instance, the authorities have made a commitment to expand public health insurance coverage to 100 percent by 2019. The bottom one-third of the population—that is, the 92 million poorest individuals—are currently covered through waivers of public health insurance premiums, which are subsidized by the government. Equity-enhancing programs such as conditional cash transfers (Program Keluarga Harapan - PKH), targeted rice transfers (Beras untuk Rakyat Miskin - RASKIN), and scholarship programs for poor students (Bantuan Siswa Miskin - BSM) are also supporting the government's efforts to reduce inequality.

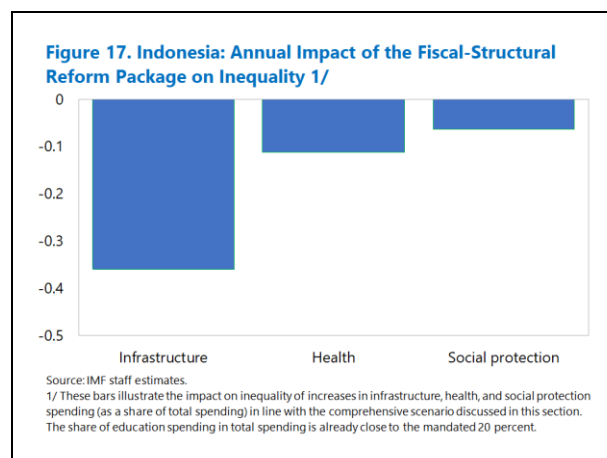
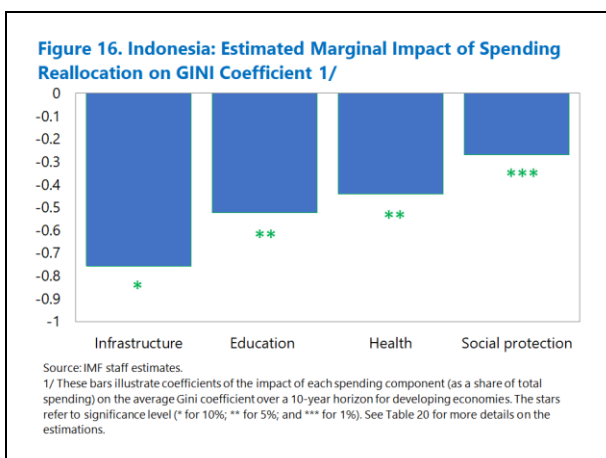
Yet, Indonesia still has room for spending on its most equity-enhancing programs, particularly the three aforementioned programs (PKH, RASKIN, and BSM), which together represent only 0.3 percent of GDP. In addition to these programs, Indonesia has an array of other social assistance programs that could be improved in terms of coverage, adequacy, and targeting, as a large share of poor and vulnerable households are not receiving all the benefits for which they are eligible (Jin 2018). An integrated database for social assistance (Pemutakhiran Basis Data Terpadu - PBDT) covering the bottom 45 percent of the income distribution has been developed. This database is an important step, as it will help the authorities consolidate various social assistance programs while improving targeting.

The IMF has previously suggested a comprehensive fiscal-structural reform package to boost potential growth and create jobs for Indonesia's fast-growing population. The reform package combines higher priority public spending (in infrastructure and targeted transfers in education, health, and social programs) with structural reforms to lower restrictions on trade and private investment, ease entry barriers and administrative burdens on businesses, and modernize the role of state-owned enterprises. This fiscal-structural package could raise potential growth by 1 percentage point to 6.5 percent in the medium term (Shin 2018).

Drawing on the empirical results presented above, this paper now turns to assessing the distributional impact of the comprehensive reform package, with a focus on the fiscal angle. Under the reform scenario, infrastructure spending would increase by 1.3 percentage points of GDP, while spending on education, health, and social programs would increase by 1.5 percentage points of GDP. It is assumed that health and social programs each will increase by 0.75 percent of GDP, as education spending as a share of total spending is already close to the statutory 20 percent.²⁴ Using the estimated elasticities shown in Figure 16, the partial equilibrium exercise shows that the increase in infrastructure as contemplated under the comprehensive scenario could lower the Gini coefficient by close to 0.4 points annually (Figure 17). Taken together, higher infrastructure, health, and social protection spending could not only boost growth but also reduce the Gini coefficient by a

²⁴ This does not imply that education spending has no impact on inequality in Indonesia. Rather, it suggests that the priority in the education sector is to improve the efficiency and quality of spending, including by (1) strengthening the link between teacher compensation and performance; (2) improving access to education, especially in rural areas; and (3) tailoring education to labor market needs (Shin 2018).

total of 0.5 points annually, or by 5.4 points over 10 years. This is substantial, as it would reverse the net increase in income inequality (5 points of the Gini coefficient) observed in Indonesia between 2002 and 2017.



With low tax revenues and the fiscal rules capping the deficit and debt levels, implementing a medium-term revenue strategy that could raise at least 3 percent of GDP over the medium term is critical to finance these equity-enhancing outlays. The estimated impact could be reduced or magnified depending on how the new spending is financed. For instance, higher value-added taxes would potentially dampen the estimated equalizing impact, while higher income taxes or excise taxes on luxury goods, which tend to be more progressive, would have the opposite effect.²⁵ In a budget-neutral manner, reallocating defense spending towards infrastructure and other social spending would also strengthen the equalizing impact of social spending. Despite remaining challenges, improvements in Indonesia's institutional environment could allow for some reallocation of spending away from military outlays towards equity-enhancing spending, within a fixed total envelope.²⁶

V. CONCLUSION

This paper has analyzed the effects of public spending reallocation on income inequality using newly assembled data on disaggregated public spending for 83 countries across all income groups. The results suggest that, in general, spending reallocation toward social

²⁵ Although taxes are primarily aimed at collecting revenue to finance redistributive transfers, improving their progressivity and reducing exemptions and preferential rates would help improve their efficiency and contribute to increasing equity (Jain-Chandra and others 2016).

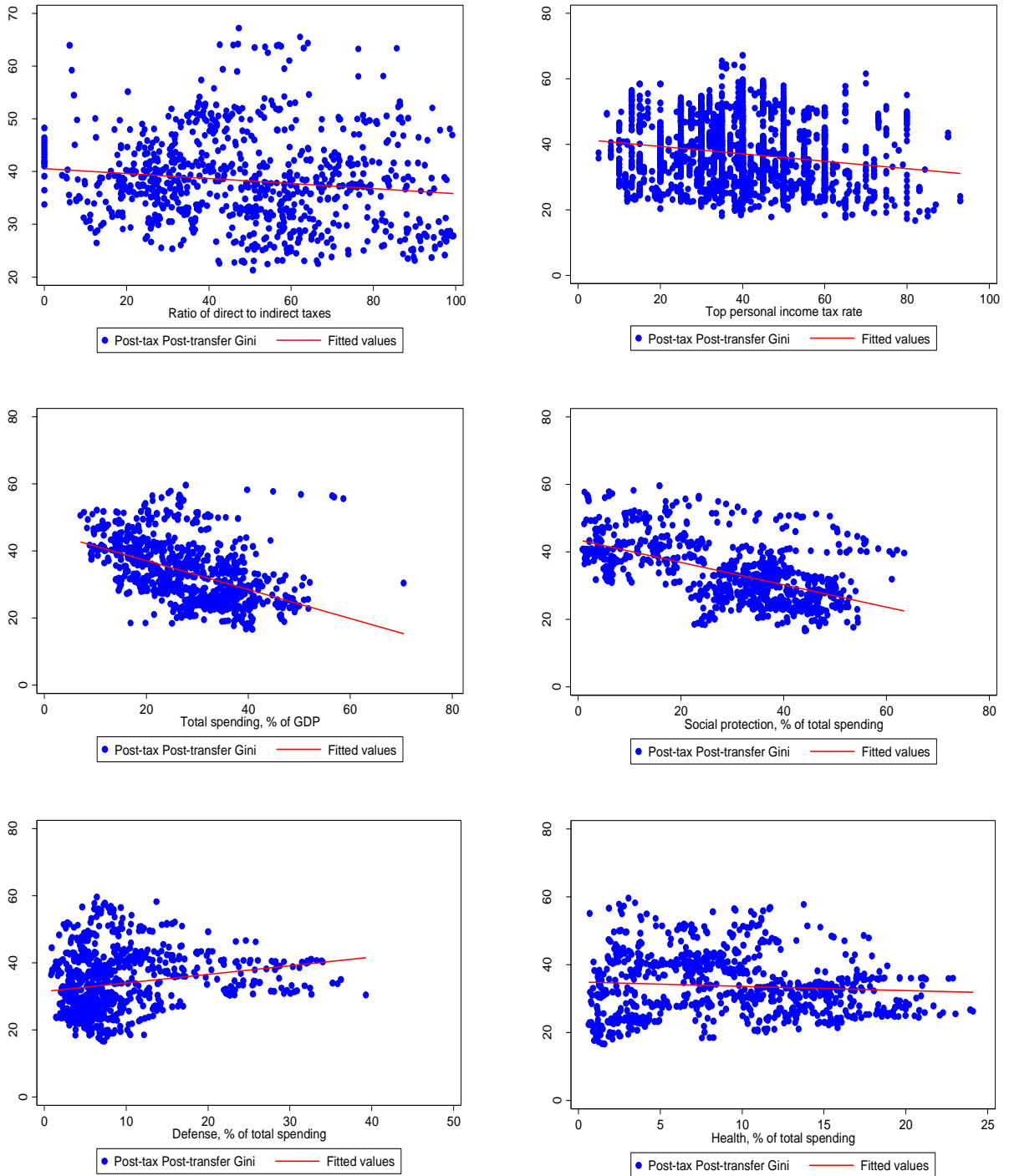
²⁶ Beyond spending increases, specific policies such as improving low-income families' access to higher education and adequate health services, as well as better targeting of social benefits (which can also finance an expansion of their coverage), are important. As administrative capacity improves, conditional cash transfers could be expanded and help in avoiding costly universal price subsidy schemes. Relying on technology solutions to further advance financial inclusion is also important. Measures to improve the overall business environment, simplify business registration, and reduce red tape could help reduce the incentives to remain in the informal sector and support inclusive growth (Jain-Chandra and others 2016).

protection and infrastructure is associated with lower income inequality. The paper shows that higher social protection and infrastructure outlays financed through cuts in defense spending are particularly equalizing. This does not mean that all countries should engage in across-the-board reductions in defense spending. Indeed, the results highlight that financing higher social protection and infrastructure spending through cuts in defense spending is associated with lower income inequality only in countries with the lowest risks of conflict and with strong institutions. In countries with a higher risk of conflict, there is no evidence that lowering defense spending to finance infrastructure and social outlays improves income distribution. These results may reflect the disproportionately higher negative impact of conflict on the poor and most vulnerable. Reallocating social protection and infrastructure spending towards other type of spending tends to increase income inequality.

The results also show that accounting for the long-term impact of health spending, and particularly education spending, is important to better capture the full impact of such expenditure on income inequality. Higher education spending and to some extent higher health spending financed through cuts in defense spending are associated with lower income inequality in the long run.

Looking forward, rising income inequality seems set to remain at the forefront of the economic policy debate around the world. Despite high public spending levels, elevated public debt, and limited domestic resources and fiscal space, governments around the world need policies to address rising inequality. When the political and security situation allows, reallocating public spending away from defense and toward social protection, infrastructure, and education seems to be a sensible approach to reducing income inequality going forward.

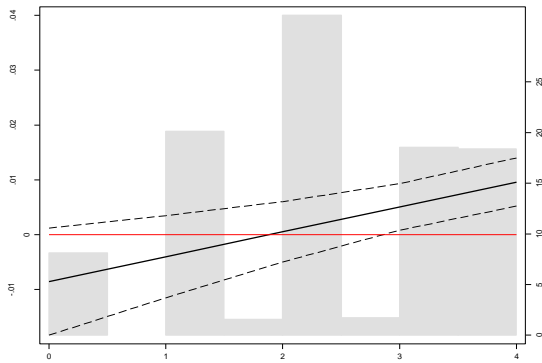
Figure 2. Progressive Taxation, Public Spending, and Income Inequality



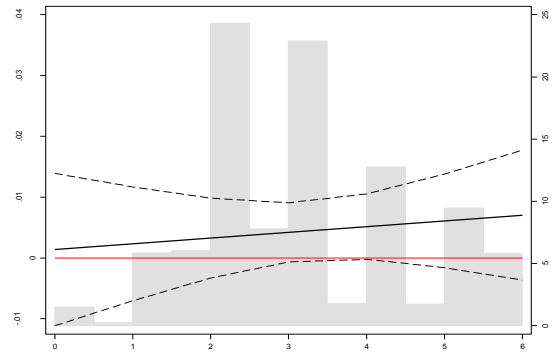
Source: IMF staff estimates.

Figure 3. Marginal Effect of Defense Spending Across the Level of Institutional Quality 1/
(No distinction of financing source)

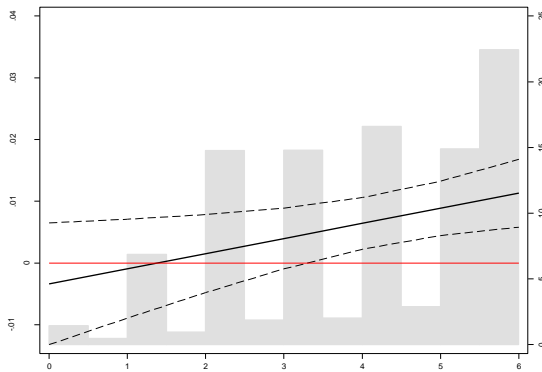
Bureaucracy Quality



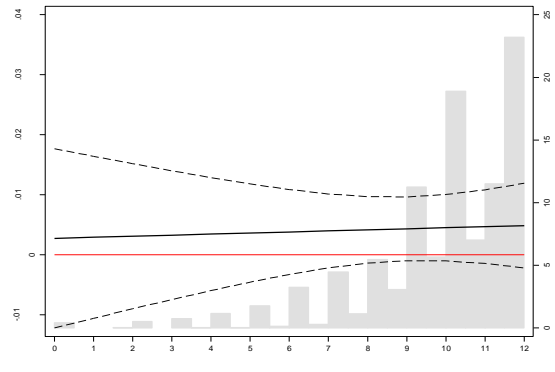
Corruption



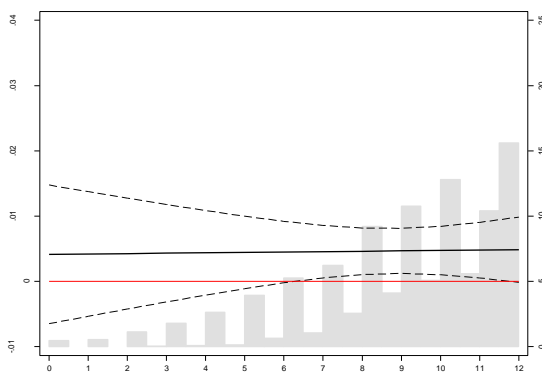
Democratic Accountability



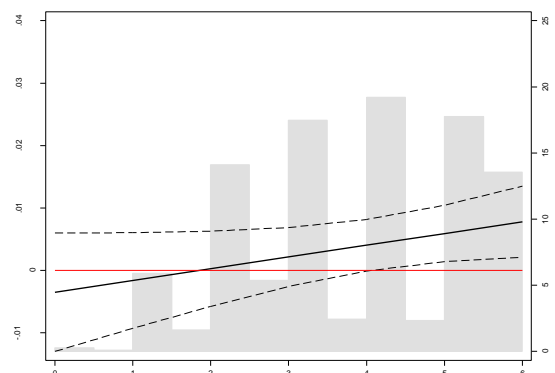
External Conflict



Internal Conflict



Law and Order

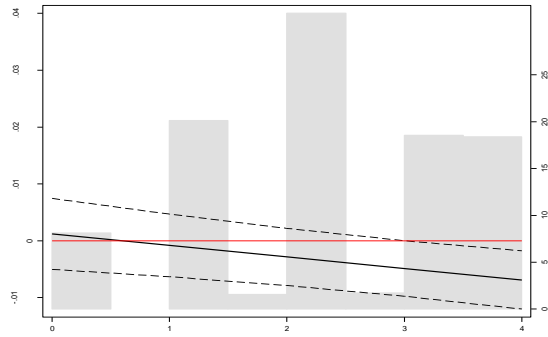


Source: IMF staff estimates.

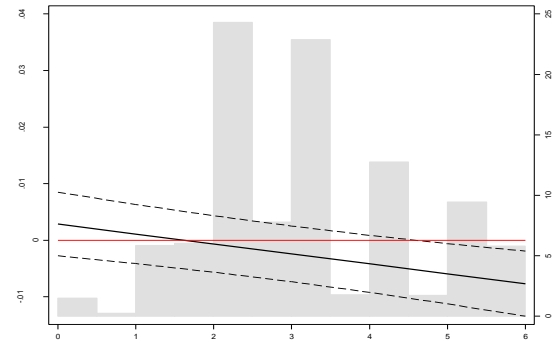
1/ For all institutional variables, a high score represents lower risk. The solid line represents the marginal effect with the corresponding 95 percent confidence intervals (dashed lines) while the red line indicates the null value of coefficients.

Figure 4. Marginal Effect of Social Spending Across the Level of Institutional Quality 1/
(Financed by cuts in defense spending)

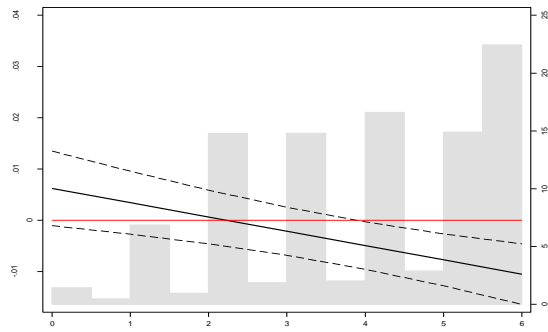
Bureaucracy Quality



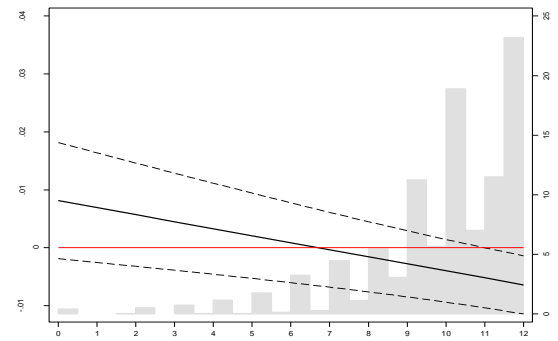
Corruption



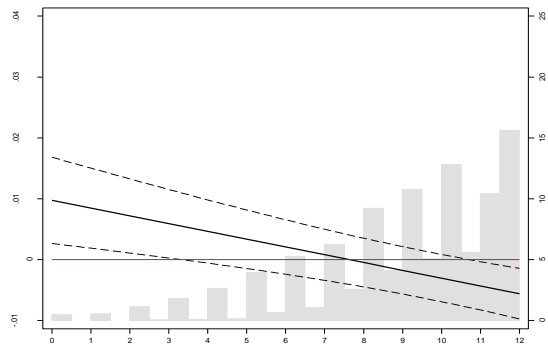
Democratic Accountability



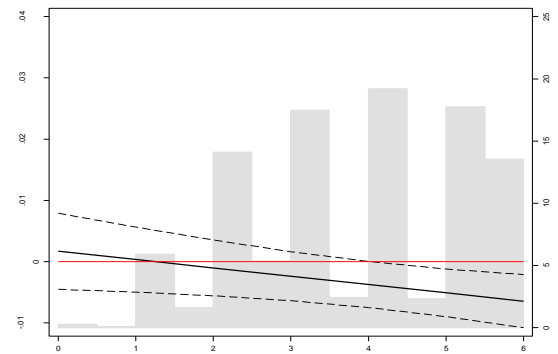
External Conflict



Internal Conflict



Law and Order

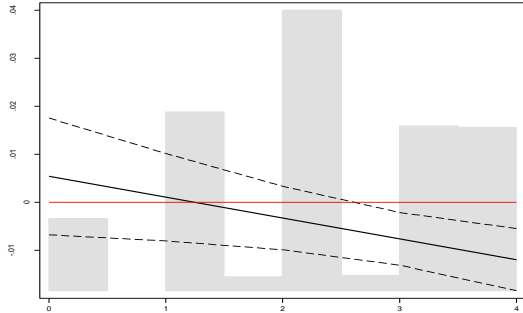


Source: IMF staff estimates.

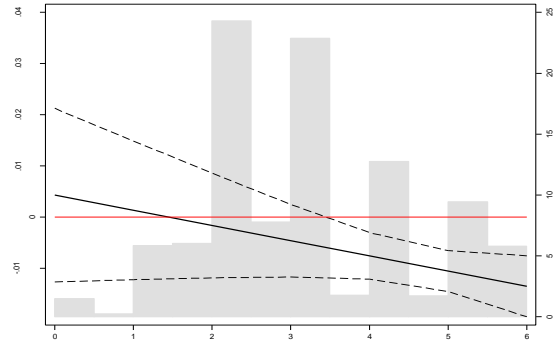
1/ For all institutional variables, a high score represents lower risk. The solid line represents the marginal effect with the corresponding 95 percent confidence intervals (dashed lines) while the red line indicates the null value of coefficients.

Figure 5. Marginal Effect of Infrastructure Spending Across the Level of Institutional Quality 1/
 (Financed by cuts in defense spending)

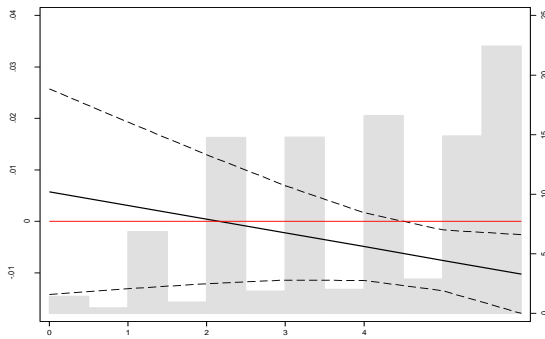
Bureaucracy Quality



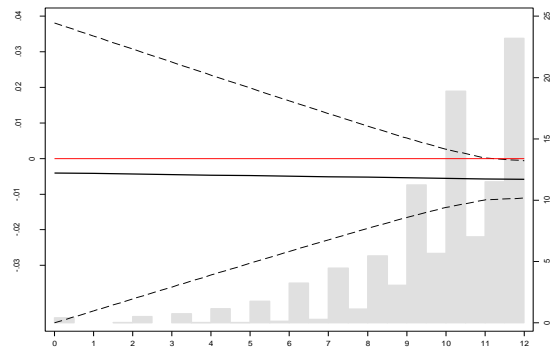
Corruption



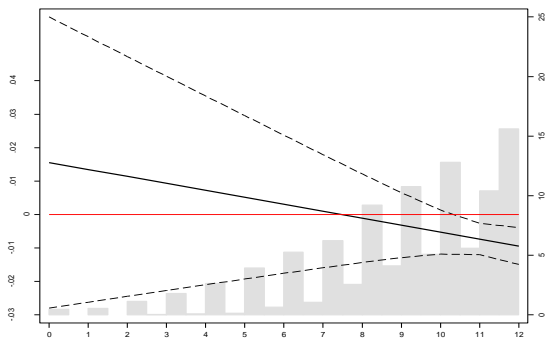
Democratic Accountability



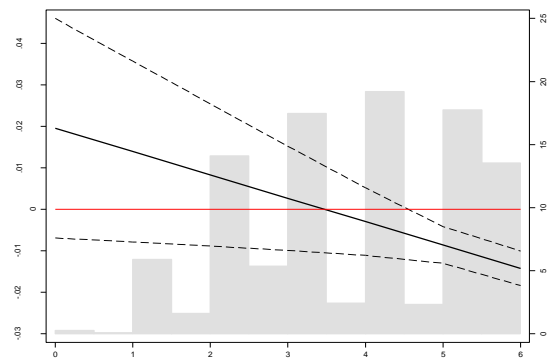
External Conflict



Internal Conflict



Law and Order



Source: IMF staff estimates.

1/ For all institutional variables, a high score represents lower risk. The solid line represents the marginal effect with the corresponding 95 percent confidence intervals (dashed lines) while the red line indicates the null value of coefficients.

Table 1. Impact of Total Spending and Spending Components on Income Inequality 1/

	Dependent Variable: Log (Net Gini)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log(GDP per capita)t-1	0.00229 (0.0371)	-0.0124 (0.0334)	0.0131 (0.0360)	0.0103 (0.0370)	0.0133 (0.0345)	0.00467 (0.0420)	-0.0139 (0.0421)	0.0168 (0.0440)	0.0144 (0.0442)	0.0177 (0.0405)
Log(GDP per capita) ² t-1	-0.00269 (0.00837)	0.000612 (0.00744)	-0.00596 (0.00843)	-0.00331 (0.00879)	-0.00435 (0.00830)	-0.00464 (0.00976)	-0.000208 (0.00949)	-0.00832 (0.0102)	-0.00552 (0.0104)	-0.00688 (0.00962)
Human capital t-1	-0.23 *** (0.0218)	-0.265 *** (0.0134)	-0.252 *** (0.0124)	-0.221 *** (0.0115)	-0.249 *** (0.0148)	-0.23 *** (0.0207)	-0.269 *** (0.0146)	-0.261 *** (0.0140)	-0.232 *** (0.0156)	-0.256 *** (0.0152)
Trade openness t-1	-0.00043 *** (0.000116)	-0.00033 *** (8.57e-05)	-0.00029 *** (0.000103)	-0.00048 *** (9.07e-05)	-0.00052 *** (0.000117)	-0.00054 *** (0.000115)	-0.00037 *** (0.000104)	-0.00036 *** (0.000111)	-0.00052 *** (9.26e-05)	-0.00057 *** (0.000102)
Technology t-1	0.0238 *** (0.00513)	0.0219 *** (0.00497)	0.0228 *** (0.00514)	0.0237 *** (0.00487)	0.0189 *** (0.00619)	0.029 *** (0.00595)	0.0257 *** (0.00671)	0.0274 *** (0.00643)	0.0265 *** (0.00593)	0.0241 *** (0.00738)
Unemployment rate t-1	0.0118 *** (0.00292)	0.0113 *** (0.00263)	0.01 *** (0.00300)	0.0115 *** (0.00334)	0.012 *** (0.00351)	0.0118 *** (0.00324)	0.0112 *** (0.00307)	0.00944 *** (0.00328)	0.0109 *** (0.00348)	0.0113 *** (0.00365)
Inflation t-1	0.000107 ** (4.85e-05)	9.25E-05 * (4.61e-05)	7.61E-05 * (3.97e-05)	0.000101 ** (4.27e-05)	9.02E-05 ** (4.32e-05)	0.000149 *** (2.84e-05)	0.000134 *** (2.21e-05)	9.54E-05 *** (2.09e-05)	0.000131 *** (1.91e-05)	0.000128 *** (2.02e-05)
Total expenditure t-1	-0.00983 *** (0.000951)	-0.0103 *** (0.00106)	-0.0103 *** (0.000919)	-0.00858 *** (0.00132)	-0.00845 *** (0.00136)	-0.00929 *** (0.00111)	-0.0102 *** (0.00128)	-0.00977 *** (0.00107)	-0.00829 *** (0.00156)	-0.00819 *** (0.00139)
Education spending t-1	0.00239 (0.00259)					0.00357 (0.00251)				
Health spending t-1		0.00653 *** (0.00161)					0.00659 *** (0.00177)			
Infrastructure t-1			-0.00767 ** (0.00353)					-0.00846 ** (0.00362)		
Social spending t-1				-0.00259 *** (0.000806)					-0.00208 ** (0.000972)	
Defense spending t-1					0.00502 ** (0.00241)					0.00404 * (0.00210)
Top PIT rate						-0.00158 *** (0.000534)	-0.00122 ** (0.000454)	-0.00162 *** (0.000523)	-0.00134 *** (0.000470)	-0.00135 ** (0.000513)
Observations	607	607	607	607	607	576	576	576	576	576
R-squared	0.699	0.715	0.701	0.707	0.707	0.711	0.726	0.712	0.712	0.713
Number of countries	60	60	60	60	60	57	57	57	57	57

1/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table 2. Impact of Spending Components on Income Inequality 1/
(Financed by cut in defense spending)

	Dependent Variable: Log (Net Gini)			
	(1)	(2)	(3)	(4)
Log(GDP per capita)t-1	0.0130 (0.0357)	0.00948 (0.0369)	-0.00795 (0.0320)	0.0157 (0.0357)
Log(GDP per capita) ² t-1	-0.00382 (0.00858)	-0.00368 (0.00850)	0.000150 (0.00744)	-0.00566 (0.00892)
Human capital t-1	-0.229 *** (0.0153)	-0.238 *** (0.0261)	-0.265 *** (0.0150)	-0.25 *** (0.0140)
Trade openness t-1	-0.000545 *** (0.000112)	-0.000545 *** (0.000145)	-0.000481 *** (0.000113)	-0.000451 *** (0.000155)
Technology t-1	0.0207 *** (0.00660)	0.0194 *** (0.00682)	0.0173 *** (0.00607)	0.0191 *** (0.00623)
Unemployment rate t-1	0.0119 *** (0.00361)	0.0123 *** (0.00326)	0.0121 *** (0.00299)	0.0112 *** (0.00366)
Inflation t-1	9.79e-05 ** (4.26e-05)	0.0001 ** (4.84e-05)	9.27e-05 * (4.77e-05)	8.13e-05 * (4.25e-05)
Total expenditure t-1	-0.00801 *** (0.00139)	-0.00844 *** (0.00137)	-0.00874 *** (0.00142)	-0.00886 *** (0.00147)
Social spending t-1	-0.00512 ** (0.00232)			
Other spending t-1	-0.00331 (0.00272)			
Education spending t-1		-0.00340 (0.00435)		
Other spending t-1		-0.0048 * (0.00250)		
Health spending t-1			0.00143 (0.00228)	
Other spending t-1			-0.0053 ** (0.00236)	
Infrastructure t-1				-0.00928 *** (0.00319)
Other spending t-1				-0.00443 (0.00262)
Observations	607	607	607	607
R-squared	0.710	0.707	0.725	0.708
Number of countries	60	60	60	60

1/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Table 3. Impact of Spending Components on Income Inequality 1/
(Financed by cut in education spending)

	Dependent Variable: Log (Net Gini)		
	(1)	(2)	(3)
Log(GDP per capita) ^{t-1}	-0.0151 (0.0357)	0.00699 (0.0391)	0.00645 (0.0380)
Log(GDP per capita) ² t-1	0.00107 (0.00776)	-0.00275 (0.00899)	-0.00484 (0.00860)
Human capital t-1	-0.255 *** (0.0265)	-0.212 *** (0.0197)	-0.231 *** (0.0252)
Trade openness t-1	-0.000355 *** (0.000124)	-0.000506 *** (0.000117)	-0.00035 ** (0.000141)
Technology t-1	0.0222 *** (0.00533)	0.024 *** (0.00507)	0.0234 *** (0.00537)
Unemployment rate t-1	0.0115 *** (0.00258)	0.0118 *** (0.00317)	0.0106 *** (0.00291)
Inflation t-1	0.000101 * (5.24e-05)	0.00011 ** (4.89e-05)	9.44E-05 * (4.83e-05)
Total expenditure t-1	-0.0102 *** (0.00104)	-0.00857 *** (0.00132)	-0.0102 *** (0.000927)
Health spending t-1	0.00518 (0.00406)		
Other spending t-1	-0.00121 (0.00268)		
Social spending t-1		-0.00375 (0.00250)	
Other spending t-1		-0.00126 (0.00286)	
Infrastructure t-1			-0.0107 *** (0.00168)
Other spending t-1			-0.00265 (0.00265)
Observations	607	607	607
R-squared	0.715	0.707	0.703
Number of countries	60	60	60

1/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table 4. Impact of Spending Components on Income Inequality 1/
(Financed by cut in health spending)

	Dependent Variable: Log (Net Gini)		
	(1)	(2)	(3)
Log(GDP per capita)t-1	-0.00960 (0.0349)	-0.0151 (0.0357)	-0.00816 (0.0338)
Log(GDP per capita) ² t-1	0.000800 (0.00799)	0.00107 (0.00776)	-0.00185 (0.00753)
Human capital t-1	-0.239 *** (0.0126)	-0.255 *** (0.0265)	-0.27 *** (0.0143)
Trade openness t-1	-0.000427 *** (9.83e-05)	-0.000355 *** (0.000124)	-0.000217 * (0.000115)
Technology t-1	0.0225 *** (0.00497)	0.0222 *** (0.00533)	0.0212 *** (0.00525)
Unemployment rate t-1	0.0115 *** (0.00286)	0.0115 *** (0.00258)	0.00963 *** (0.00256)
Inflation t-1	0.000102 ** (4.65e-05)	0.000101 * (5.24e-05)	7.44e-05 * (4.34e-05)
Total expenditure t-1	-0.00906 *** (0.00145)	-0.0102 *** (0.00104)	-0.0108 *** (0.00102)
Social spending t-1	-0.00849 *** (0.00182)		
Other spending t-1	-0.00617 *** (0.00167)		
Education spending t-1		-0.00518 (0.00406)	
Other spending t-1		-0.00639 *** (0.00182)	
Infrastructure spending t-1			-0.0171 *** (0.00474)
Other spending t-1			-0.0071 *** (0.00164)
Observations	607	607	607
R-squared	0.723	0.715	0.722
Number of groups	60	60	60

1/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table 5. Impact of Spending Components on Income Inequality 1/
(Financed by cut in social spending)

	Dependent Variable: Log (Net Gini)		
	(1)	(2)	(3)
Log(GDP per capita) ^{t-1}	-0.00960 (0.0349)	0.00699 (0.0391)	0.0145 (0.0374)
Log(GDP per capita) ² t-1	0.000800 (0.00799)	-0.00275 (0.00899)	-0.00529 (0.00899)
Human capital t-1	-0.239 *** (0.0126)	-0.212 *** (0.0197)	-0.224 *** (0.0104)
Trade openness t-1	-0.000427 *** (9.83e-05)	-0.000506 *** (0.000117)	-0.000404 *** (0.000109)
Technology t-1	0.0225 *** (0.00497)	0.024 *** (0.00507)	0.0233 *** (0.00504)
Unemployment rate t-1	0.0115 *** (0.00286)	0.0118 *** (0.00317)	0.0104 *** (0.00325)
Inflation t-1	0.000102 ** (4.65e-05)	0.00011 ** (4.89e-05)	8.81e-05 ** (4.07e-05)
Total expenditure t-1	-0.00906 *** (0.00145)	-0.00857 *** (0.00132)	-0.00896 *** (0.00127)
Health spending t-1	0.00849 *** (0.00182)		
Other spending t-1	0.00232 *** (0.000839)		
Education spending t-1		0.00375 (0.00250)	
Other spending t-1		0.00249 ** (0.000920)	
Infrastructure spending t-1			-0.00444 (0.00318)
Other spending t-1			0.0025 *** (0.000768)
Observations	607	607	607
R-squared	0.723	0.707	0.710
Number of groups	60	60	60

1/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Table 6. Impact of Spending Components on Income Inequality 1/
(Financed by cut in infrastructure spending)

	Dependent Variable: Log (Net Gini)		
	(1)	(2)	(3)
Log(GDP per capita)t-1	-0.00816 (0.0338)	0.0145 (0.0374)	0.00645 (0.0380)
Log(GDP per capita) ² t-1	-0.00185 (0.00753)	-0.00529 (0.00899)	-0.00484 (0.00860)
Human capital t-1	-0.27 *** (0.0143)	-0.224 *** (0.0104)	-0.231 *** (0.0252)
Trade openness t-1	-0.000217 * (0.000115)	-0.000404 *** (0.000109)	-0.00035 ** (0.000141)
Technology t-1	0.0212 *** (0.00525)	0.0233 *** (0.00504)	0.0234 *** (0.00537)
Unemployment rate t-1	0.00963 *** (0.00256)	0.0104 *** (0.00325)	0.0106 *** (0.00291)
Inflation t-1	7.44e-05 * (4.34e-05)	8.81E-05 ** (4.07e-05)	9.44e-05 * (4.83e-05)
Total expenditure t-1	-0.0108 *** (0.00102)	-0.00896 *** (0.00127)	-0.0102 *** (0.000927)
Health spending t-1	0.0171 *** (0.00474)		
Other spending t-1	0.0101 *** (0.00365)		
Social spending t-1		0.00444 (0.00318)	
Other spending t-1		0.00694 ** (0.00313)	
Education spending t-1			0.0107 *** (0.00168)
Other spending t-1			0.00801 ** (0.00306)
Observations	607	607	607
R-squared	0.722	0.710	0.703
Number of groups	60	60	60

1/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table 7. Robustness: The Role of Institutions Using Median Value 1/ 2/

	Dependent Variable: Log (Net Gini)								
	No distinction in financing source			Cut in defense to finance infrastructure			Cut in defense to finance social protection		
	All	Institutions above	Institutions below median	All	Institutions above	Institutions below median	All	Institutions above	Institutions below median
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Total expenditure t-1	-0.00845 *** (0.00133)	-0.0078 *** (0.00140)	-0.00876 *** (0.00245)	-0.00992 *** (0.00106)	-0.01 *** (0.00138)	-0.00674 * (0.00361)	-0.00801 *** (0.00136)	-0.00708 *** (0.00153)	-0.00736 ** (0.00331)
Defense spending t-1	0.00502 ** (0.00236)	0.00825 *** (0.00231)	-0.00325 (0.00359)						
Infrastructure t-1				-0.00832 ** (0.00341)	-0.0158 *** (0.00336)	0.00242 (0.00706)			
Social spending t-1							-0.00512 ** (0.00227)	-0.00848 *** (0.00234)	0.00175 (0.00417)
Other spending t-1				0.00188 * (0.00101)	0.00345 ** (0.00133)	0.00272 *** (0.000904)	-0.00331 (0.00266)	-0.00483 * (0.00257)	0.00445 (0.00342)
Observations	607	442	165	607	442	165	607	442	165
R-squared	0.707	0.692	0.669	0.705	0.691	0.680	0.710	0.704	0.680
Number of groups	60	42	28	60	42	28	60	42	28

1/ Controls variables (GDP per capita, human capital, trade openness, technology, unemployment rate, and inflation) are included but not presented for brevity. The institutional variable used for these illustrations is the quality of bureaucracy.

2/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

**Table 8. Robustness: Long-Term Impact of Spending 1/
(Ten-year framework)**

	Dependent Variable: Log (Net Gini), t to t+9								
	No distinction in financing source					Financed by cuts in defense spending			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log(GDP per capita)t-1	-0.0193 (0.0296)	-0.0354 (0.0284)	-0.0125 (0.0291)	-0.0150 (0.0322)	-0.0113 (0.0281)	-0.00932 (0.0291)	-0.0301 (0.0271)	-0.00877 (0.0286)	-0.0123 (0.0308)
Log(GDP per capita) ² t-1	-0.00113 (0.00652)	0.00217 (0.00577)	-0.00393 (0.00659)	-2.97e-05 (0.00768)	-0.00164 (0.00692)	-0.00197 (0.00709)	0.00226 (0.00625)	-0.00320 (0.00736)	-0.000487 (0.00754)
Human capital t-1	-0.231 *** (0.0181)	-0.249 *** (0.0118)	-0.24 *** (0.0115)	-0.201 *** (0.0110)	-0.236 *** (0.0141)	-0.242 *** (0.0230)	-0.251 *** (0.0134)	-0.239 *** (0.0132)	-0.21 *** (0.0125)
Trade openness t-1	-0.00037 *** (8.29e-05)	-0.00031 *** (7.31e-05)	-0.00025 *** (7.71e-05)	-0.00049 *** (7.84e-05)	-0.00052 *** (0.000103)	-0.0005 *** (0.000115)	-0.00049 *** (9.83e-05)	-0.00043 *** (0.000129)	-0.00055 *** (9.82e-05)
Technology t-1	0.0262 *** (0.00403)	0.0254 *** (0.00376)	0.0253 *** (0.00404)	0.0255 *** (0.00333)	0.0196 *** (0.00517)	0.0193 *** (0.00597)	0.0184 *** (0.00500)	0.0199 *** (0.00523)	0.0222 *** (0.00492)
Unemployment rate t-1	0.00739 *** (0.00188)	0.00726 *** (0.00157)	0.00564 *** (0.00191)	0.0083 *** (0.00229)	0.0084 *** (0.00231)	0.00826 *** (0.00225)	0.00849 *** (0.00197)	0.00724 *** (0.00256)	0.00865 *** (0.00243)
Inflation t-1	8.71e-05 (5.59e-05)	8.61e-05 (5.46e-05)	6.49e-05 (4.68e-05)	9.38e-05 * (4.85e-05)	7.69e-05 (4.60e-05)	7.17e-05 (5.12e-05)	8.00e-05 (5.11e-05)	6.63e-05 (4.53e-05)	8.80e-05 * (4.63e-05)
Total expenditure t-1	-0.00836 *** (0.000908)	-0.00854 *** (0.000982)	-0.00889 *** (0.000867)	-0.00716 *** (0.000942)	-0.00727 *** (0.00110)	-0.00729 *** (0.00108)	-0.00736 *** (0.00116)	-0.00773 *** (0.00120)	-0.00687 *** (0.00102)
Education spending t-1	0.000615 (0.00205)					-0.00649 * (0.00379)			
Health spending t-1		0.0053 *** (0.00139)					-0.000307 (0.00189)		
Infrastructure t-1			-0.00944 *** (0.00283)					-0.0109 *** (0.00243)	
Social spending t-1				-0.00335 *** (0.000566)					-0.00552 *** (0.00189)
Defense spending t-1					0.00565 *** (0.00199)				
Other spending t-1						-0.00576 ** (0.00211)	-0.00611 *** (0.00203)	-0.00496 ** (0.00219)	-0.00299 (0.00212)
Observations	652	652	652	652	652	652	652	652	652
R-squared	0.683	0.696	0.690	0.705	0.699	0.699	0.714	0.702	0.708
Number of countries	62	62	62	62	62	62	62	62	62

1/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

**Table 9. Robustness: Long-Term Impact of Spending 1/
(Eight-year framework)**

	Dependent Variable: Log (Net Gini), t to t+7								
	No distinction in financing source					Financed by cuts in defense spending			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log(GDP per capita) ^{t-1}	-0.0158 (0.0316)	-0.0313 (0.0300)	-0.00751 (0.0310)	-0.0101 (0.0343)	-0.00597 (0.0302)	-0.00524 (0.0312)	-0.0256 (0.0287)	-0.00347 (0.0307)	-0.00696 (0.0329)
Log(GDP per capita) ^{2t-1}	-0.00181 (0.00701)	0.00140 (0.00617)	-0.00491 (0.00707)	-0.000865 (0.00823)	-0.00255 (0.00747)	-0.00267 (0.00762)	0.00150 (0.00670)	-0.00410 (0.00792)	-0.00139 (0.00810)
Human capital t-1	-0.23 *** (0.0184)	-0.252 *** (0.0122)	-0.244 *** (0.0116)	-0.203 *** (0.0109)	-0.239 *** (0.0144)	-0.242 *** (0.0232)	-0.254 *** (0.0139)	-0.242 *** (0.0134)	-0.213 *** (0.0128)
Trade openness t-1	-0.00038 *** (8.57e-05)	-0.00032 *** (7.06e-05)	-0.00025 *** (7.68e-05)	-0.0005 *** (7.96e-05)	-0.00053 *** (0.000106)	-0.00053 *** (0.000123)	-0.0005 *** (0.000101)	-0.00045 *** (0.000134)	-0.00056 *** (0.000102)
Technology t-1	0.0262 *** (0.00402)	0.0253 *** (0.00380)	0.0251 *** (0.00410)	0.0254 *** (0.00340)	0.019 *** (0.00538)	0.0189 *** (0.00610)	0.0177 *** (0.00519)	0.0193 *** (0.00545)	0.0216 *** (0.00515)
Unemployment rate t-1	0.00798 *** (0.00205)	0.0077 *** (0.00170)	0.00608 *** (0.00204)	0.00887 *** (0.00256)	0.009 *** (0.00254)	0.00895 *** (0.00247)	0.00907 *** (0.00217)	0.00786 *** (0.00278)	0.00928 *** (0.00271)
Inflation t-1	9.51e-05 (5.72e-05)	9.07e-05 (5.56e-05)	6.87e-05 (4.74e-05)	9.85e-05 * (4.92e-05)	8.07e-05 * (4.65e-05)	7.88e-05 (5.19e-05)	8.40e-05 (5.17e-05)	7.02e-05 (4.57e-05)	9.18e-05 * (4.68e-05)
Total expenditure t-1	-0.00833 *** (0.000955)	-0.00857 *** (0.00102)	-0.0089 *** (0.000903)	-0.00708 *** (0.00101)	-0.00717 *** (0.00116)	-0.00717 *** (0.00115)	-0.00727 *** (0.00121)	-0.00762 *** (0.00127)	-0.00674 *** (0.00109)
Education spending t-1	0.00115 (0.00211)					-0.00641 (0.00378)			
Health spending t-1		0.00554 *** (0.00140)					-0.000498 (0.00199)		
Infrastructure t-1			-0.00969 *** (0.00295)					-0.0113 *** (0.00252)	
Social spending t-1				-0.00348 *** (0.000632)					-0.00599 *** (0.00201)
Defense spending t-1					0.0061 *** (0.00211)				
Other spending t-1						-0.00614 *** (0.00220)	-0.00657 *** (0.00214)	-0.00542 ** (0.00232)	-0.00344 (0.00221)
Observations	650	650	650	650	650	650	650	650	650
R-squared	0.681	0.695	0.688	0.703	0.699	0.699	0.715	0.701	0.707
Number of countries	62	62	62	62	62	62	62	62	62

1/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

**Table 10. Robustness: Long-Term Impact of Spending 1/
(Five-year framework)**

	Dependent Variable: Log (Net Gini), t to t+4								
	No distinction in financing source					Financed by cuts in defense spending			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log(GDP per capita) ¹ t-1	-0.0108 (0.0331)	-0.0260 (0.0310)	-0.000321 (0.0324)	-0.00345 (0.0356)	0.00126 (0.0320)	0.000289 (0.0333)	-0.0199 (0.0299)	0.00396 (0.0325)	0.000316 (0.0342)
Log(GDP per capita) ² t-1	-0.00242 (0.00740)	0.000777 (0.00647)	-0.00598 (0.00746)	-0.00181 (0.00857)	-0.00351 (0.00789)	-0.00335 (0.00804)	0.000848 (0.00701)	-0.00513 (0.00835)	-0.00244 (0.00843)
Human capital t-1	-0.229 *** (0.0185)	-0.258 *** (0.0126)	-0.248 *** (0.0115)	-0.209 *** (0.0105)	-0.244 *** (0.0144)	-0.241 *** (0.0236)	-0.26 *** (0.0144)	-0.247 *** (0.0134)	-0.22 *** (0.0139)
Trade openness t-1	-0.00041 *** (9.09e-05)	-0.00032 *** (6.84e-05)	-0.00026 *** (8.13e-05)	-0.00051 *** (7.78e-05)	-0.00055 *** (0.000110)	-0.00056 *** (0.000132)	-0.00052 *** (0.000104)	-0.00047 *** (0.000140)	-0.00058 *** (0.000105)
Technology t-1	0.0264 *** (0.00409)	0.0252 *** (0.00392)	0.0252 *** (0.00425)	0.0254 *** (0.00359)	0.0187 *** (0.00572)	0.0188 *** (0.00637)	0.0174 *** (0.00550)	0.019 *** (0.00576)	0.021 *** (0.00563)
Unemployment rate t-1	0.00909 *** (0.00226)	0.00865 *** (0.00188)	0.007 *** (0.00219)	0.00983 *** (0.00284)	0.01 *** (0.00283)	0.0101 *** (0.00273)	0.0101 *** (0.00240)	0.00889 *** (0.00298)	0.0103 *** (0.00300)
Inflation t-1	0.000105 * (5.86e-05)	9.66e-05 (5.71e-05)	7.38e-05 (4.82e-05)	0.000104 ** (5.03e-05)	8.60E-05 * (4.72e-05)	8.85e-05 (5.27e-05)	8.96e-05 * (5.27e-05)	7.53e-05 (4.61e-05)	9.60e-05 * (4.73e-05)
Total expenditure t-1	-0.00838 *** (0.00100)	-0.00867 *** (0.00107)	-0.00898 *** (0.000939)	0.00717 *** (0.00108)	-0.00716 *** (0.00123)	-0.00715 *** (0.00123)	-0.00729 *** (0.00128)	-0.00761 *** (0.00132)	-0.00677 *** (0.00116)
Education spending t-1	0.00182 (0.00218)					-0.00601 (0.00389)			
Health spending t-1		0.00597 *** (0.00144)					-0.000388 (0.00205)		
Infrastructure t-1			-0.01 *** (0.00331)					-0.0118 *** (0.00290)	
Social spending t-1				-0.00339 *** (0.000656)					-0.00632 *** (0.00214)
Defense spending t-1					0.00642 *** (0.00223)				
Other spending t-1						-0.00636 *** (0.00231)	-0.0069 *** (0.00226)	-0.00573 ** (0.00240)	-0.00401 (0.00243)
Observations	648	648	648	648	648	648	648	648	648
R-squared	0.680	0.695	0.687	0.700	0.698	0.698	0.716	0.701	0.705
Number of groups	62	62	62	62	62	62	62	62	62

1/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. B152

Table 11. Robustness: Change in Net Gini as the Dependent Variable 1/ 2/

	Dependent Variable: Change in Net Gini, t to t+4			Dependent Variable: Change in Net Gini, t to t+9	
	(1)	(2)	(3)	(4)	(5)
Total expenditure t-1	0.000363 (0.000406)	0.000579 (0.000463)	0.000420 (0.000417)	0.000612 (0.000757)	0.00104 (0.000809)
Infrastructure t-1	-0.00333 ** (0.00152)				
Social spending t-1		-0.000152 (0.000269)			
Defense spending t-1			-0.000271 (0.000478)		
Education spending t-1				-0.00461 *** (0.00136)	
Health spending t-1					-0.00191 * (0.000952)
Observations	578	578	578	498	498
R-squared	0.168	0.159	0.159	0.254	0.228
Number of groups	60	60	60	57	57

1/ Controls variables (GDP per capita, human capital, trade openness, technology, unemployment rate, and inflation) are included but not presented for brevity. We show two different time spans (5 year change and 10 year change) because the data seems to support that the impact of education and health spending tends to materialize after a longer time horizon.

2/ Standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 12. Robustness Check: Market Gini 1/

	Dependent Variable: Log (Net Gini)								
	No distinction in financing source					Financed by cuts in defense spending			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log(GDP per capita) ^{t-1}	0.0338 (0.0249)	0.0238 (0.0263)	0.0376 (0.0268)	0.0369 (0.0259)	0.0358 (0.0248)	0.0322 (0.0237)	0.0233 (0.0258)	0.0369 (0.0260)	0.0356 (0.0253)
Log(GDP per capita) ^{2t-1}	-0.00127 (0.00598)	0.000918 (0.00593)	-0.00222 (0.00674)	-0.00169 (0.00634)	-0.00167 (0.00606)	-0.00106 (0.00572)	0.000976 (0.00583)	-0.00229 (0.00668)	-0.00144 (0.00619)
Human capital t-1	-0.0837 *** (0.0261)	-0.102 *** (0.0201)	-0.0928 *** (0.0199)	-0.0875 *** (0.0182)	-0.0922 *** (0.0192)	-0.0821 *** (0.0260)	-0.102 *** (0.0198)	-0.0931 *** (0.0195)	-0.0833 *** (0.0179)
Trade openness t-1	-0.00051 *** (5.56e-05)	-0.00046 *** (5.86e-05)	-0.00047 *** (6.58e-05)	-0.0005 *** (7.03e-05)	-0.00046 *** (7.24e-05)	-0.00048 *** (6.84e-05)	-0.00044 *** (7.02e-05)	-0.00043 *** (9.69e-05)	-0.00047 *** (7.35e-05)
Technology t-1	0.0166 *** (0.00271)	0.0155 *** (0.00268)	0.0162 *** (0.00282)	0.0164 *** (0.00260)	0.017 *** (0.00277)	0.0175 *** (0.00286)	0.0161 *** (0.00279)	0.0171 *** (0.00272)	0.0179 *** (0.00260)
Unemployment rate t-1	0.0123 *** (0.00211)	0.012 *** (0.00185)	0.0118 *** (0.00230)	0.0121 *** (0.00231)	0.0119 *** (0.00232)	0.0121 *** (0.00212)	0.0119 *** (0.00189)	0.0115 *** (0.00237)	0.0119 *** (0.00235)
Inflation t-1	6.36e-05 ** (2.47e-05)	5.73e-05 ** (2.51e-05)	5.29e-05 ** (2.21e-05)	5.77e-05 ** (2.28e-05)	5.58e-05 ** (2.23e-05)	6.51e-05 ** (2.45e-05)	5.73e-05 ** (2.47e-05)	5.16e-05 ** (2.12e-05)	5.93e-05 ** (2.22e-05)
Total expenditure t-1	0.000440 (0.000589)	0.000165 (0.000602)	0.000308 (0.000681)	0.000613 (0.000664)	0.000130 (0.000777)	0.000139 (0.000773)	-3.59e-05 (0.000762)	-6.15e-05 (0.000961)	0.000333 (0.000756)
Education spending t-1	0.00108 (0.00120)					0.00233 (0.00174)			
Health spending t-1		0.00399 *** (0.00127)					0.00464 *** (0.00133)		
Infrastructure t-1			-0.00160 (0.00315)					-0.00119 (0.00296)	
Social spending t-1				-0.000432 (0.000523)					0.000794 (0.00104)
Defense spending t-1					-0.000840 (0.00104)				
Other spending t-1						0.00104 (0.00106)	0.000674 (0.00100)	0.00112 (0.00129)	0.00161 (0.00127)
Observations	607	607	607	607	607	607	607	607	607
R-squared	0.414	0.435	0.413	0.414	0.414	0.415	0.436	0.415	0.416
Number of groups	60	60	60	60	60	60	60	60	60

1/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Table 13. Robustness Check: Use of General Government Data 1/ 2/

	Dependent Variable: Log (Net Gini), t to t+9						
	No distinction in financing source				Financed by cuts in defense spending		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Total expenditure t-1	-0.00971 *** (0.000592)	-0.00973 *** (0.000536)	-0.00806 *** (0.000919)	-0.00809 *** (0.000689)	-0.00831 *** (0.000684)	-0.0085 *** (0.000636)	-0.00762 *** (0.000890)
Education spending t-1	-0.00276 ** (0.00123)				-0.00949 *** (0.00212)		
Health spending t-1		-0.00755 *** (0.00134)				-0.0111 *** (0.00180)	
Social spending t-1			-0.00252 *** (0.000681)				-0.00876 *** (0.00107)
Defense spending t-1				0.00828 *** (0.00111)			
Other spending t-1					-0.00816 *** (0.00105)	-0.00705 *** (0.000983)	-0.00759 *** (0.00124)
Observations	650	650	650	650	650	650	650
R-squared	0.751	0.761	0.756	0.772	0.772	0.775	0.773
Number of groups	51	51	51	51	51	51	51

1/ Controls variables (GDP per capita, human capital, trade openness, technology, unemployment rate, and inflation) are included but not presented for brevity.

2/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Table 14. Robustness Check: Controlling for the Efficiency of Capital Spending 1/ 2/

	Dependent Variable: Log (Net Gini)			
	(1)	(2)	(3)	(4)
Overall PIMA Index	0.0423 (0.0476)	-0.0205 (0.0435)	0.0115 (0.0363)	-0.0172 (0.0490)
Total expenditure t-1	-0.00835 (0.00995)	-0.0141 (0.00967)	-0.0129 (0.00995)	-0.0140 (0.0109)
PIMA*total expenditure t-1	0.000255 (0.00130)	0.00118 (0.00126)	0.000905 (0.00127)	0.00113 (0.00152)
Education spending t-1	0.0359 *** (0.00561)			
PIMA*Education spending t-1	-0.00502 *** (0.000948)			
Health spending t-1		0.00728 (0.0141)		
PIMA*Health spending t-1		-0.000778 (0.00182)		
Infrastructure t-1			0.0381 (0.0240)	
PIMA*Infrastructure t-1			-0.0077 ** (0.00321)	
Social spending t-1				0.00228 (0.00642)
PIMA*Social spending t-1				-0.000101 (0.00100)
Observations	322	322	322	322
R-squared	0.724	0.698	0.713	0.700
Number of groups	30	30	30	30

1/ Controls variables (GDP per capita, human capital, trade openness, technology, unemployment rate, and inflation) are included but not presented for brevity.

2/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Table 15. Robustness Check: Controlling for Debt Financing of Public Outlays 1/ 2/

	Dependent Variable: Log (Net Gini)			
	(1)	(2)	(3)	(4)
Total expenditure t-1	-0.0115 *** (0.00331)	-0.013 *** (0.00288)	-0.0117 *** (0.00320)	-0.00962 *** (0.00257)
Debt*total expenditure t-1	2.02e-05 (3.69e-05)	4.09e-05 (2.56e-05)	2.20e-05 (3.56e-05)	1.98e-05 (2.18e-05)
Education spending t-1	-0.00445 (0.00443)			
Debt*education spending t-1	0.000178 *** (5.43e-05)			
Health spending t-1		-0.00236 (0.00213)		
Debt*health spending t-1		0.000151 *** (5.08e-05)		
Infrastructure t-1			-0.0292 *** (0.00571)	
Debt*Infrastructure t-1			0.00056 *** (6.79e-05)	
Social spending t-1				-0.00262 * (0.00141)
Debt*social spending t-1				1.12e-05 (2.42e-05)
Observations	403	403	403	403
R-squared	0.793	0.795	0.806	0.786
Number of groups	53	53	53	53

1/ Controls variables (GDP per capita, human capital, trade openness, technology, unemployment rate, inflation, and public debt level) are included but not presented for brevity.

2/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Table 16. Robustness Check: Advanced Versus Developing Countries 1/ 2/
(No distinction of financing source)

	Dependent Variable: Log (Net Gini), t to t+9									
	Advanced economies					Developing economies				
	General Government				Central Government	General Government				Central Government
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Total expenditure t-1	-0.00877 *** (0.00167)	-0.00914 *** (0.00166)	-0.0087 *** (0.00216)	-0.00739 *** (0.00154)	-0.00896 *** (0.00130)	-0.00959 *** (0.000678)	-0.00929 *** (0.000611)	-0.00777 *** (0.000947)	-0.0085 *** (0.000749)	-0.00923 *** (0.00108)
Education spending t-1	0.00267 (0.00297)					-0.00523 ** (0.00217)				
Health spending t-1		-0.0112 *** (0.00249)					-0.00443 ** (0.00168)			
Social spending t-1			-0.000683 (0.000985)					-0.0027 *** (0.000684)		
Defense spending t-1				0.0105 *** (0.00122)					0.00534 ** (0.00206)	
Infrastructure t-1					-0.0107 *** (0.00317)					-0.00756 * (0.00405)
Observations	187	187	187	187	166	463	463	463	463	486
R-squared	0.743	0.771	0.742	0.791	0.790	0.776	0.775	0.778	0.775	0.721
Number of groups	32	32	32	32	28	42	42	42	42	53

1/ Controls variables (GDP per capita, human capital, trade openness, technology, unemployment rate, and inflation) are included but not presented for brevity. Because general government data does not specifically separate infrastructure spending, we use central government data on infrastructure spending for this robustness check.

2/ Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

APPENDIX I. DESCRIPTION OF DATA AND SAMPLE COUNTRY LIST

Table I.1. Summary Statistics of Main Variables

Variable	Mean	Std. Dev.	Min	Max
Net Gini	36.7	9.6	14.1	67.2
Per capita GDP (in thousands)	6.2	11.7	0.0	118.2
Human capital index	2.1	0.7	1.0	3.7
Trade openness	76.7	53.3	0.0	809.2
Share of ICT in capital	2.7	2.0	0.0	11.6
Unemployment rate	8.2	6.0	0.0	70.0
Inflation rate	33.6	424.5	-72.7	23,773.1
Total expenditure/GDP	27.5	10.7	7.1	80.7
Education spending/total spending	11.9	6.2	0.9	30.8
Health spending/total spending	8.3	5.2	0.6	24.1
Infrastructure spending/total spending	6.1	3.5	0.7	28.9
Social spending/total spending	25.8	16.5	0.4	66.0
Defense spending/total spending	10.2	8.5	0.7	49.1
Top personal income tax rate	40.1	16.1	5.0	95.0

Table I.2. Sample Country List

The following are the 60 countries used in the baseline regressions:

Advanced Economies: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Korea, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Sweden, Switzerland, United Kingdom, and United States.

Developing and Emerging Countries: Albania, Argentina, Bolivia, Brazil, Bulgaria, Chile, Colombia, Croatia, Dominican Republic, Egypt, El Salvador, Hungary, Indonesia, Iran, Jamaica, Kazakhstan, Mauritius, Morocco, Panama, Paraguay, Poland, Romania, Russia, South Africa, Syria, Thailand, Tunisia, Turkey, Ukraine, Uruguay, and Venezuela.

APPENDIX II. CORRELATION OF INCOME DISTRIBUTION METRICS

Table II.1. Pairwise Correlation of Different Measures of Income Distribution 1/

	Log Gini	Log Gini, LIS	Log Top 10 Income Share	Log Bottom 10 Income Share	Ratio of Top to Bottom 10 Percent Income Shares
Log Gini	1				
Log Gini, LIS	0.9969 ***	1			
Log top 10 income share	0.9263 ***	0.9486 ***	1		
Log bottom 10 income share	-0.7484 ***	-0.8884 ***	-0.8097 ***	1	
Ratio of top to bottom decile income shar	0.2497 ***	0.8667 ***	0.2884 ***	-0.5797 ***	1

1/ *** p<0.01, ** p<0.05, * p<0.1

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