

# Public Expenditures and Inequality in Asia-Pacific: Understanding the Relationship



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# Summary

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The COVID-19 pandemic has highlighted the importance of inclusive and resilient growth and the role of fiscal policy in ensuring a better outcome. This policy brief examines the relationship between income inequality and

government expenditures on education, health, housing and social protection in the Asia-Pacific region. It draws policy lessons for making public social spending a more potent tool for promoting inclusive growth.

# I. Introduction

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The COVID-19 pandemic has caused significant disruptions in economies of the Asia-Pacific region, pushing an estimated 89 million people back into extreme poverty and causing about 140 million job losses (ESCAP, 2021). Lack of inclusiveness and equal access to opportunities and basic services, which became more evident during the pandemic, meant that the disruptions were felt most strongly by those already vulnerable. These negative impacts of the pandemic call on policymakers to adopt and implement policy actions that can address the perpetuating problem of income inequality and promote inclusive development in the long run, as they plan for post-pandemic recovery.

This policy brief considers fiscal policy as a potential option, focusing on the expenditure side. After a preliminary assessment of the composition of government spending in Asia and the Pacific, the brief examines how different functional groups of public expenditures may affect income inequality using correlation and regression analyses. It finds that government spending on education and social protection helps reduce inequality, while spending on housing tends to increase inequality, even though the impact varies by programs or subfunctions within each sector. The analysis calls for a greater focus on specific items under housing, such as rural infrastructure, and the expansion of access and coverage for health and other social expenditure programs.

# II. Public expenditure in Asia-Pacific countries

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Data using the Classification of the Functions of Government (COFOG), which splits government expenditures into 10 functions or sectors, reveals the composition of public spending.<sup>1</sup> General public services (GF01), economic affairs (GF04), education (GF09), and social protection (GF10) were among the largest sectors, while environmental protection (GF05), housing and community amenities (GF06), and recreation, culture, and religion (GF08) were among the smallest.

Figure 1 reveals interesting differences among Asia-Pacific subregions. For example, social protection is relatively small in South-East Asia, while health is relatively large in the Pacific, compared to other parts of the region. Economic affairs, which includes various sectors such as agriculture, transport, and energy, tends to be large in all subregions. The defense budget is also quite large in subregions such as South and South-West Asia.

Public social expenditures are largely delivered at the local level. Therefore, looking at central government expenditure, the share of expenditure on health, education, and social protection tends to be smaller than in general government expenditure. At the same time, the share going to

general public services, which includes intergovernmental transfers, is much larger.

Subregional patterns however hide significant variations across countries. For example, the share of government spending on social protection was much larger in Thailand compared to its neighbor Indonesia, while the share on economic affairs was larger in Myanmar than in any other countries in the subregion, in 2019 (figure 2.A).

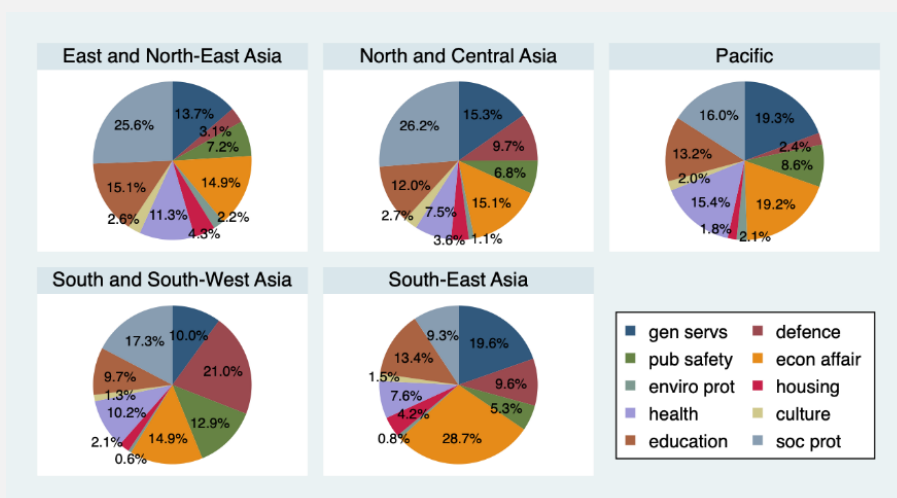
In general, developing Asia spends relatively less on social sectors (such as health and social protection) but more on the functions related to capital formation or infrastructure development (such as economic affairs and housing and community amenities). High income countries tend to also spend more on environmental protection, which accounted for 2.5 percent of total government expenditures in 2019, compared to less than one percent in middle income countries. Even among those middle-income countries, environmental protection represented a bigger share of the budget in small island nations — in fact, in Palau, more than 5 percent of central government spending went to the function. Some differences are noticeable also among the developed countries: For instance, Japan spends more on social protection and less on education compared to Australia and New Zealand, possibly due to the different demographics (figure 2.B).

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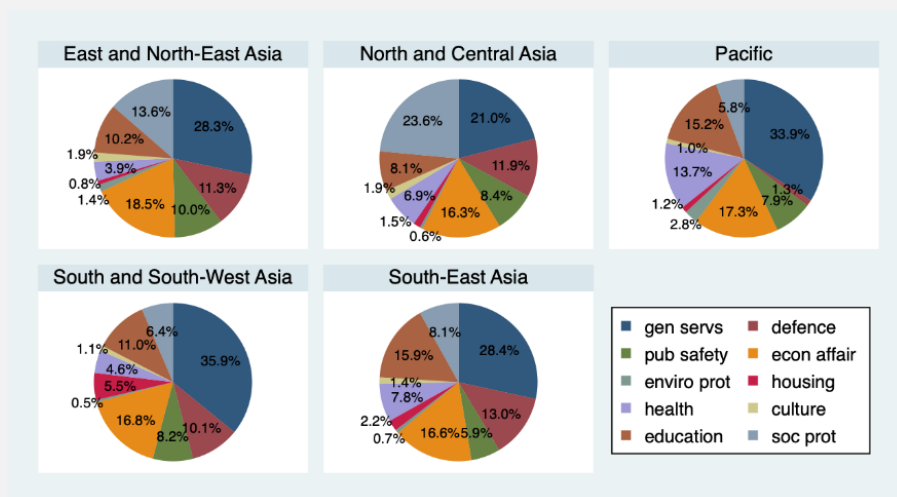
1 COFOG is a classification used generally for government expenditures. The data used in this brief is from the IMF

**FIGURE 1: COMPOSITION OF GOVERNMENT EXPENDITURES IN EACH SUBREGION**

**A. General government expenditures, latest year for each country**



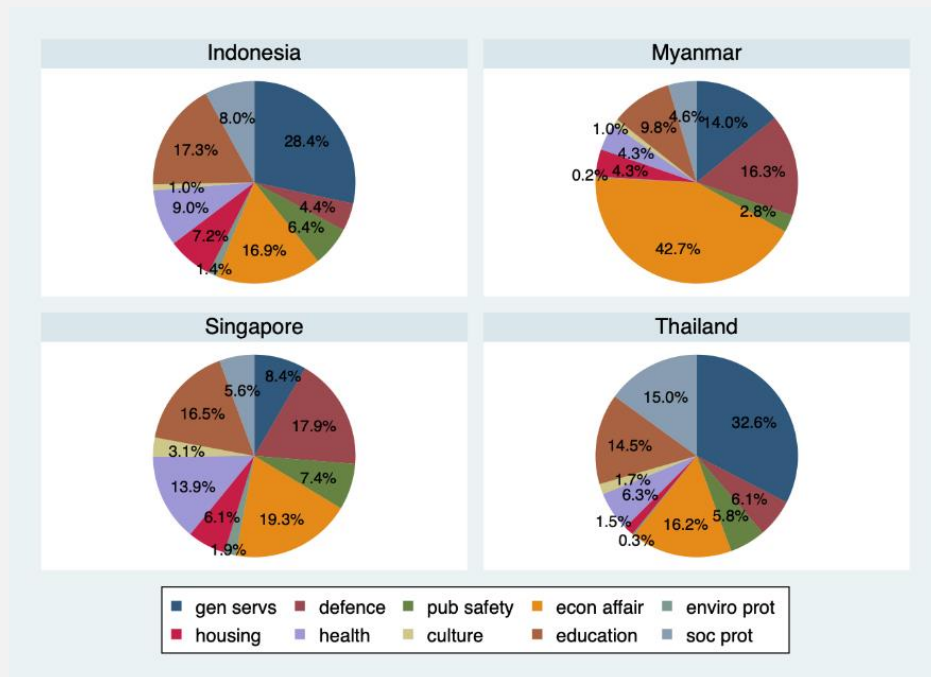
**B. Budgetary central government expenditures, latest year for each country**



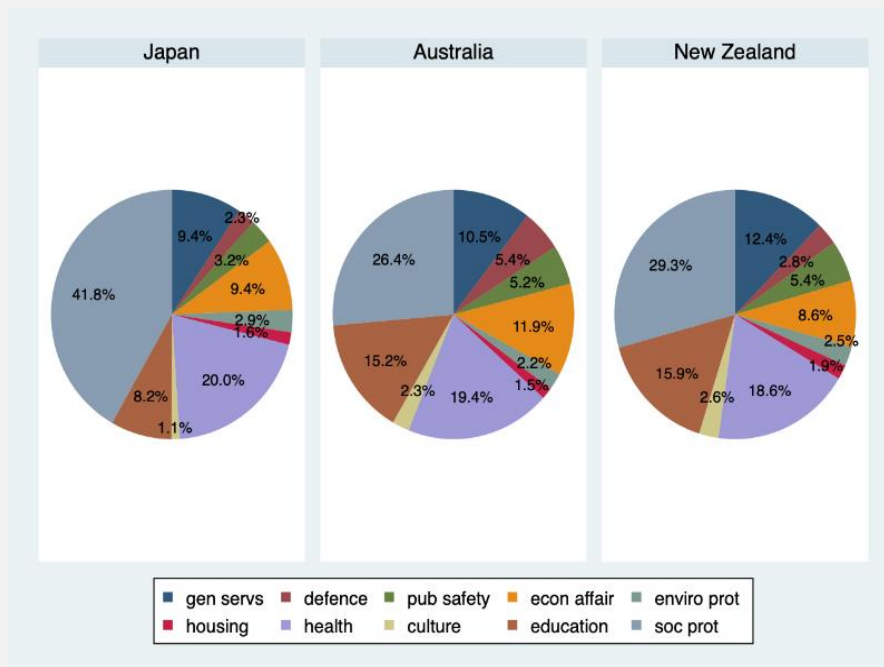
*Note:* Figures show the average shares among countries in each subregion, using expenditure data for the latest available year in each country. Only those with data on all 10 functions were considered. These are: China 2018, Hong Kong 2018, Japan 2019, Macao 2019, Mongolia 2019, Republic of Korea 2010 (East and North-East Asia), Armenia 2019, Azerbaijan 2019, Georgia 2019, Kazakhstan 2019, Russia 2019 (North and Central Asia), Australia 2019, Kiribati 2019, Marshall Islands 2018, Micronesia 2019, Nauru 2018, New Zealand 2019, Palau 2018, Papua New Guinea 2019, Samoa 2019, Solomon Islands 2020 (Pacific), Afghanistan 2017, Bangladesh 2016, Maldives 2011, Nepal 2019, Pakistan 2015, Sri Lanka 2019, Turkey 2019 (South and South-West Asia), Myanmar 2019, Philippines 2019, Singapore 2019, Thailand 2019, Timor-Leste 2012 (South-East Asia). Some countries have both general and central government data, some only one. Total expenditures are calculated as the sum of expenditure on the 10 COFOG categories and may not include unspecified expenditures. Pies may not add up to 100 due to rounding errors.

**FIGURE 2: COMPOSITION OF GENERAL GOVERNMENT EXPENDITURES IN SELECTED COUNTRIES**

**A. South-East Asia: Indonesia, Myanmar, Singapore, and Thailand, 2019**



**B. Developed countries: Japan vs. Australia and New Zealand, 2019**





# III. Link between public expenditures and income inequality

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## A. CORRELATION ANALYSIS

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Figure 3 shows statistically significant relationships between several types of general government expenditures and income inequality in Asia and the Pacific. Income inequality is measured as the Gini indices using disposable or post-tax, post-transfer income, available from either the Standardized World Income Inequality Database (SWIID) or the UNU-WIDER database. Both Gini indices are positively correlated with spending on housing and community amenities, and negatively correlated with spending on the three main social sectors (i.e., health, education, and social protection) (figure 3.A). The correlations between disposable income inequality and the four COFOG categories of expenditures are illustrated also in figure 3.C, which plots the SWIID's estimates of Gini against shares of GDP spent on each function.

These patterns are generally in line with the existing literature. Claus, Martinez-Vazquez and Vulovic (2012), for example, find evidence that public spending on health and education reduces the Gini coefficient in Asia — with especially large effects for education — based on a cross-country regression analysis. Most country-level studies, such as the Commitment to Equity (CEQ) Institute's benefit incidence analyses and the World Bank's public expenditure reviews (PERs), also find the impact of government spending on education to be large and progressive in Asia and the Pacific. For instance, the redistributive impact of Sri Lanka's fiscal policy was primarily due to spending on education in 2009/10 (Arunatilake, Inchauste and Lustig, 2017); and in Vietnam, in-kind transfers in education accounted for roughly two-thirds of total

inequality reduction from fiscal activity in 2014 (World Bank Group 2016). In-kind spending on health was also pro-poor and equalizing in both countries, although with smaller impacts.

Another common finding in the CEQ studies — for not only Sri Lanka and Vietnam, but also countries such as Georgia and Mongolia — is that spending on tertiary education is often the least progressive within education. In line with this finding, correlation coefficients shown in figure 3.B, using second-level COFOG categories and SWIID estimates of disposable income inequality, show that spending on secondary education is strongly associated with lower Gini coefficients in Asia and the Pacific, while that on tertiary education is not. Accessibility and enrollment rates among the poor, which tend to be especially low at the tertiary level, may help explain this pattern. To illustrate, in Cambodia, 32 percent of government spending on *all* levels of education went to the richest quintile in 2004; the comparable figure reduced to 22 percent in 2014, however, with increased enrollment across all quintiles (World Bank Group, 2019).

In addition to in-kind transfers in health and education, most country-specific studies find pensions and social assistance transfers to be progressive. In Mongolia in 2016, pensions alone had a marginal effect of reducing the Gini by 3.4 points (World Bank Group, 2018); contributory pensions were also the main driver of inequality reduction from direct transfers in Armenia in 2011 (Younger and Khachatryan, 2017). Claus, Martinez-Vazquez and Vulovic (2012), however, find that public spending on housing *and* social protection is regressive in Asia, unlike in other parts of the world. While this policy brief finds a negative correlation

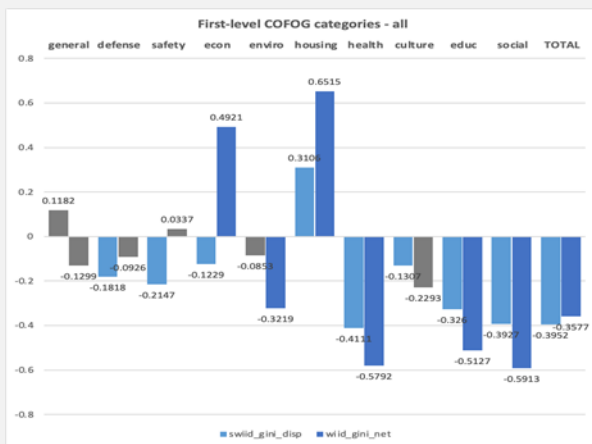
between the Gini index and social protection spending in the region, figure 3.C does show a stronger linear relationship for the rest of the world. In addition, the sample of Asian countries used in Claus, Martinez-Vazquez and Vulovic (2012) does not include any in North and Central Asia or the Pacific, where social protection represents a relatively large share of public expenditures.

Case studies also find that individual social assistance programs can have different impacts on inequality, depending on targeting and other design issues. Figure 3.B suggests a strong, negative

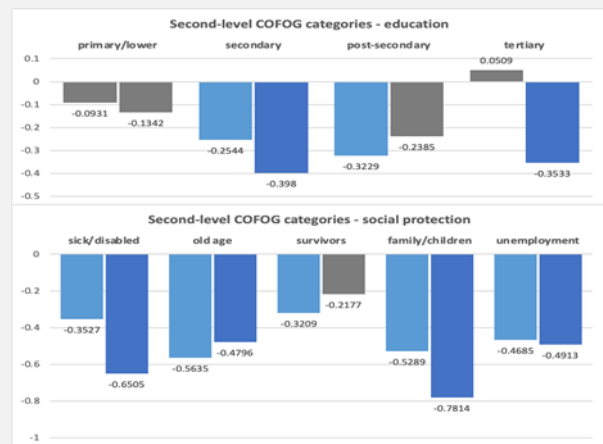
correlation between the Gini indices and spending on the subfunction “family and children” in social protection. In Armenia, however, childcare benefits were the least progressive among the direct transfers that were examined because they went only to mothers in the social security system or the formal sector (Younger and Khachatryan, 2017). Such findings highlight the role of country- and program-specific contexts in shaping the relationship between public expenditures and income inequality.

**FIGURE 3: DISPOSABLE INCOME INEQUALITY AND GENERAL GOVERNMENT EXPENDITURES**

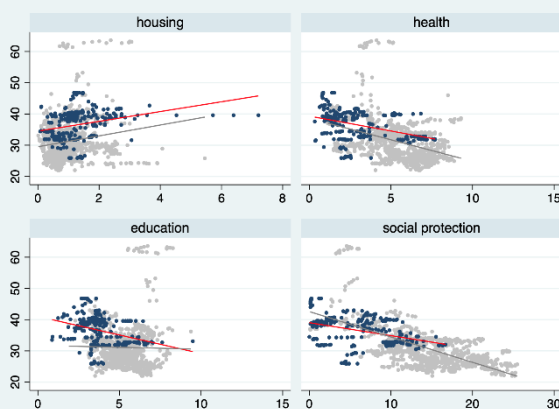
**A. Pairwise correlation coefficients, first-level, Asia-Pacific countries only**



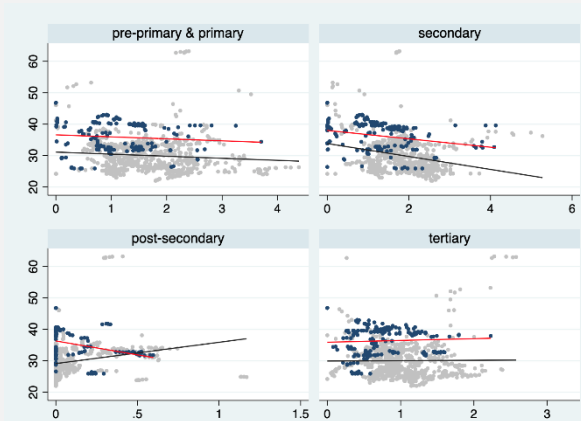
**B. Pairwise correlation coefficients, Pairwise correlation coefficients,**



**C. *swiid\_gini\_disp* vs. spending on selected COFOG categories (as a share of GDP), 1990-2019**



**D. *swiid\_gini\_disp* vs. spending on selected education categories (as a share of GDP), 1990-2019**



*Note:* The bars in grey show correlation coefficients that are not statistically significant at 5 percent. Correlation coefficients using the two measures of income inequality (*swiid\_gini\_disp* in lighter blue and *wiid\_gini\_net* in darker blue) differ, likely due to the differences in time and country coverage, imputation methods, and original sources of data. In scatterplots, observations for Asia-Pacific countries are shown in navy marks and red line, with those for the rest of the world in grey. Subfunctions not shown include subsidiary services to education, R&D, etc.

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## B. PANEL REGRESSION ANALYSIS

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This section attempts to quantify the impact of government expenditure policy on income inequality by estimating the following equation:

$$gini_{it} = \alpha + \beta F_{it-1} + \gamma X_{it} + v_i + \varepsilon_{it}, \\ i = 1, \dots, N; t = 1, \dots, T$$

where the Gini coefficient in country  $i$  in year  $t$  is a function of the fiscal variables of interest from previous year,  $F_{it-1}$ , and a set of control variables,  $X_{it}$ . The error term  $v_i$  stands for unobserved country fixed effects, and  $\varepsilon_{it}$  for idiosyncratic errors. Fiscal variables are lagged by one year to reduce the risk of reverse causality, where more unequal countries may spend more on public services to lower income inequality or less due to political reasons. Moreover, although some social programs may immediately change the redistribution of income, the impact of in-kind spending on education and health for example would likely be delayed.

The analysis uses SWIID's estimates of the Gini due to better data availability. Fiscal variables of interest are shares of GDP spent on the four COFOG categories that were examined in the previous section: housing and community amenities, health, education, and social protection. Control variables include factors of income inequality that are either commonly used in the literature (e.g., GDP per capita, human capital index) or of special relevance to the current context (e.g., economic shock). See the appendix for more discussion and a full list of variables. The dataset is an unbalanced panel that covers the period 1990-2019. Disaggregated expenditure data at the general government level are available for 79 countries (26 in Asia and the

Pacific), for a total of 1,375 country-year observations, but the number used in the regression analysis is smaller due to data availability for control variables. Following the recent paper from Doumbia and Kinda (2019), we use the fixed effects panel regression with Driscoll-Kraay standard errors.

Regression results, presented in Table 1, suggest that government spending on education and social protection is likely inequality reducing, while spending on housing and health is likely inequality increasing. The effects seem to be smaller in Asia and the Pacific, controlling for other variables. Some of the control variables show unexpected results, possibly because the indicators used in this analysis due to available data are imperfect proxies. Own-account workers who are considered vulnerable, for example, may be high income earners that enjoy good working conditions in some countries. In addition, most variables considered do not vary as much over time as they do by countries, which may make the fixed effects estimation using within-group variation difficult.<sup>2</sup>

Despite such limitations, results suggest that government spending on housing seems to be the least progressive among the four functions considered, both in Asia and the Pacific and the rest of the world. One factor could be that housing and community development programs tend to be concentrated in wealthier areas, due to the unequal access to infrastructure within countries. The positive association between health spending and income inequality, and the statistically insignificant association for education, may be related to problems with accessibility, utilization or enrollment, and coverage or targeting, which country-level studies have found to influence the incidence of government transfers and benefits

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<sup>2</sup> The analysis also takes for granted the quality of expenditure data using COFOG and relies on the Gini indices as a measure of income inequality. If expenditure items were miscategorized or if there are measurement errors in the Gini, regression estimates may not be

reliable. In addition, most variables considered do not vary as much over time as they do by countries, which may make the fixed effects estimation using within-group variation difficult.

TABLE 1: FIXED EFFECTS PANEL REGRESSION RESULTS  
(USING GENERAL GOVERNMENT EXPENDITURES)

	<i>swiid_gini_disp</i>					
housing t-1	0.5085*				0.4163**	0.5588**
interacted with AP	-0.3798**					-0.4693***
health t-1		0.3525***			0.3532***	0.4296***
interacted with AP		-0.3106**				-0.3696***
education t-1			0.0736		-0.0901	-0.1036
interacted with AP			-0.0972			0.0706
social t-1				-0.0927	-0.1190**	-0.1522***
interacted with AP				0.0341		0.1097
ln (GDP pc)	-2.5182	-1.3145	-0.7945	2.1433	1.2015	0.8043
ln (GDP pc) <sup>2</sup>	0.051	-0.0018	-0.0396	-0.2302	-0.1802	-0.1688
human capital	-0.9889**	-0.6083	-0.9068**	-0.7651*	-0.4341	-0.4683
governance	0.8629**	0.8531*	0.8744**	0.8595**	0.6916	0.7882*
tax revenue	-0.031	-0.0197	-0.0291	-0.0225	-0.014	-0.0139
trade	0.0131***	0.0141***	0.0132***	0.0134***	0.0150***	0.0148***
vulnerable employment	-0.0336	-0.0623**	-0.0415	-0.0451*	-0.0599**	-0.0677**
bank crisis	-0.0197	-0.1006	-0.0834	-0.0952	-0.0696	-0.0803
natural disaster	0.0187	-0.0267	-0.0205	-0.0258	-0.0145	-0.0074
no. observations	915	921	921	919	915	915
no. countries	59	59	59	59	59	59
within R-squared	0.1601	0.1616	0.1379	0.1484	0.1938	0.2062

Note: \* significant at 10 percent, \*\* significant at 5 percent, \*\*\* significant at 1 percent.

# IV. Policy recommendations

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Findings from this brief suggest that government spending on housing, as it is currently designed and implemented, may worsen income inequality in a country, while spending on certain social sectors may help reduce it. Some lessons emerge from the examination of the link between selected functions of public expenditures and income inequality:

## Housing and basic infrastructure

Infrastructure development can enhance market access and labor mobility, as well as ease information flows. It could help disadvantaged individuals gain access to productive opportunities (Calderon and Serven, 2004). However, infrastructure spending tends to be heavily tilted towards urban and higher income regions. Moreover, regions better endowed in human and private capital may have higher returns on infrastructure spending, leading to a widening of income and wealth gaps. This analysis suggests that greater attention is needed for rural infrastructure and key items under housing spending, such as water and sanitation. For developing Asia-Pacific, ESCAP (2019) estimated an annual investment gap of \$83 billion in water and sanitation.

## Health spending

Health spending can enhance productivity through higher human capital accumulation. The degree to which public health spending reduces inequality, however, may vary depending on factors such as a country's progress on universal health coverage (UHC). Along with the lack of available health services, especially in rural areas, weak financial protection and high out-of-pocket spending could push households into poverty. Overall, in developing Asia-Pacific, ESCAP (2019) estimates that additional spending of \$41-50 per capita per year would be needed through the year 2030 to

scale up health systems and interventions. Financing health spending through general tax revenues improves equity compared with contribution-based schemes but should be accompanied by strategies to enhance efficiency.

## Education spending

Expanding access to quality education, as envisioned in SDG4, could enhance upward social mobility by making lower-income individuals more productive and better able to compete for higher-paying jobs (Becker, 1964). An expansion of the number of graduates could also reduce the skill gap and the associated wage gap. However, in some cases, the benefits of government spending, including education programs, are often captured by the urban middle class, potentially worsening income inequality. Along with the incidence, the composition of education spending also matters. To achieve SDG4, ESCAP (2019) estimated that reallocation towards non-salary recurrent spending would be needed, especially spending to help marginalized children start and stay in school, in the form of a means-tested subsidy. Over time, this would enhance social mobility and reduce inequality.

## Social protection spending

Social protection is important in developing countries where the majority of people are still vulnerable to falling back into poverty from external shocks, such as the COVID-19 pandemic. Several studies show that cash transfers are particularly effective in income redistribution, and this analysis also finds a negative relationship between overall social protection spending and income inequality. While social protection spending has increased in many countries, high spending does not imply wide coverage and in many countries, the current composition is heavily geared towards pensions for a small group of the population. Therefore, in line with ILO

recommendations, ESCAP (2019) estimated the cost of providing a universal social protection floor, or basic income security over the life cycle, starting with child benefits. The ESCAP Social Protection Simulation Tool shows how income distribution changes with different cash transfer schemes.<sup>3</sup>

### Program-based approach

Addressing any design flaws in social expenditure programs, improving benefit targeting, and reallocating resources based on incidence analyses are additional ways to maximize the redistributive impact of fiscal policy. In Indonesia, the overall reduction in income inequality from fiscal policy rose from 2.9 Gini points in 2012 to 3.4 points in 2017. The World Bank attributed this change partly to the reduction of energy subsidies, which were poorly targeted and regressive, improvement in the targeting and expansion of the conditional cash transfer program, and transformation of the rice subsidy program (Indonesia PER 2020).

### Net fiscal incidence

While this brief focused on the public expenditure side, it is worth highlighting that net fiscal incidence, including the tax incidence, is the relevant equity measure that government authorities need to use in judging specific policies (Lustig, 2018). The forthcoming 2022 edition of the *Economic and Social Survey* takes stock of country case studies on net fiscal incidence. For further discussion on progressive tax reforms, see Jian and Lee (2018) and ESCAP and Oxfam (2017).

### Types of inequality

Finally, the optimal mix of fiscal interventions will depend on country- and program-specific contexts as well as the type of inequality policy makers wish to address. In China, the fiscal system was found to reduce overall and regional inequality but widen the urban-rural income gap, largely because urban residents receive much higher income from contributory pensions. This exemplifies how a policy can reduce one measure of inequality while exacerbating another.

3 This online tool is available from [www.socialprotection-](http://www.socialprotection-toolbox.org/simulation-tool)

[toolbox.org/simulation-tool](http://toolbox.org/simulation-tool).

# Conclusion

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While fiscal policy is considered critical for inclusive recovery, developing countries generally have less experience in using fiscal policy for inclusive growth and there is a wide knowledge gap when it comes to what works well or not in their specific country contexts. At the same time, the pandemic has resulted in revenue shortfalls and increased pressures on expenditures for governments such that they may need to make critical trade-offs in allocating resources. This policy brief provided a preliminary assessment of how different types of public expenditures have

affected income distribution in Asia-Pacific countries in recent decades. It found that government spending on education and social protection is likely inequality reducing, while spending on housing is likely inequality increasing and evidence on health spending is mixed. This calls for greater attention to not only cross-sectoral budgetary allocation but also within-sector allocation as well as better program design and implementation. The 2022 *Economic and Social Survey* examines these aspects further, based on country case studies as well as cross-country quantitative analysis.

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# Appendix

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## LIST OF CONTROL VARIABLES

**GDP per capita:** in constant US\$, log transformed to reduce the skew, from WDI.

GDP per capita is included in our model as a potential confounding variable, as richer countries should be able to spend more on public services. Regarding its relationship with income inequality, Kuznets (1955) claimed that it would show an inverted U-shape curve, as economic growth initially benefits only a small segment of the population but eventually leads to a more equal distribution of income. Following his hypothesis, we include the natural log of income per capita and its squared term as control variables.

**Human Capital Index (HCI):** on a scale of 1.0 to 4.5, from Penn World Table version 10.0.

The index, which is based on the average years of schooling data, is used as a proxy for a country's level of education. There is a strong positive relationship between educational attainment and educational equality, and thus income equality.

**Governance:** simple average of the six aggregate indicators, on a scale of approximately -2.5 to 2.5, from the Worldwide Governance Indicators (WGI).

Governance issues can affect the composition and effectiveness of public spending. For instance, corruption may lead to concentration of funds in certain programs that benefit the elites. Lack of stability and legal protection may also distort the economic environment for poorer households and individuals, further exacerbating income inequality.

**Tax revenue:** total tax revenue as a percent of GDP, from IMF.

Tax revenue serves as a critical source of financing for government expenditure. Governments with relatively high revenue may be able to spend more, including on social programs that benefit lower-income groups, which may in turn help reduce income inequality. The variable could also serve as a proxy for the size of government, which some believe to be associated with inequality.

**Trade:** sum of exports and imports of goods and services as a percent of GDP, from WDI.

Relationship with income inequality could be negative if it raises the demand for unskilled labor, positive if it raises the demand for skilled labor. Might increase social spending if and as the government tries to compensate workers who are hurt by globalization.

**Vulnerable employment:** contributing family workers and own-account workers as a percent of total employment, from WDI (modeled ILO estimates).

Shortcomings in the labor market (e.g., lack of quality jobs in the formal market) can put lower-income groups at a further disadvantage by preventing them from opportunities to earn income.

**Banking crises and natural disasters:** Luc Laeven and Fabian Valencia (2018) and EM-DAT.

Economic shocks and/or natural disasters, like the COVID-19 pandemic, can disproportionately affect the poor and increase government spending at the same time.

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