COVID-19 Impact on Poverty in Pacific Island Countries : A Macro-Micro Simulation Approach

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1. Introduction

This note presents the distributional impacts of the COVID-19 shock estimated for four Pacific Island countries (PICs) where recent pre-pandemic household income and expenditure surveys (HIES) are available: Fiji, Kiribati, the Marshall Islands, and Vanuatu. While these countries did not experience community transmission of COVID-19 in 2020, gross domestic product (GDP) fell sharply in most of them because of border closures. By translating aggregate output and employment changes to individual and household-level income changes, the approach simulates household welfare and poverty in 2020 under two scenarios: with and without the COVID-19 shock—the differences between them indicating the distributional impacts of such shock. The simulated poverty impacts represent upper bound estimates; they do not consider any support provided by the government to mitigate the shock. Thus, this note additionally analyzes the potential decline in poverty resulting from several key social protection programs implemented in 2020. The model also captures the impacts of other shocks that occurred during the period under analysis, such as Cyclone Harold, which severely hit several PICs in 2020. Given the limited data availability in the PICs, we also use this methodology to back-cast poverty and study its trends. Key findings are summarized as follows.

> **Key findings**
>
> - Backed by GDP growth, poverty rates are estimated to have gradually declined in most Pacific Island countries between 2016 and 2019.
> - In the absence of government mitigation measures, COVID-19 and climate-related shocks would have substantially increased poverty in the PICs during 2020. When comparing scenarios with and without these shocks, poverty rates during the first year of the crisis are estimated to have increased by as much as 8.7 percentage points based on the lower-middle-income international poverty line (US$3.2 per capita per day in 2011 purchasing power parity [PPP] terms). This is equivalent to losing four years of gains in poverty reduction.
> - The tourism sector was severely hit by the COVID-19 pandemic: while only representing less than 10 percent of employment, it drove a quarter to half of the poverty increase between 2019 and 2020 in Fiji, Kiribati, and Vanuatu.
> - Although mitigation policies, such as expansions of existing social protection programs, provided support to households to cope with the COVID-19 shock, they were estimated to be insufficient to undo the increases in poverty in most of the analyzed countries. The mitigation

effects appear to have been minimal in the Marshall Islands and Vanuatu, while poverty impacts are likely to have been more than halved thanks to the social protection programs implemented in Fiji. Kiribati is an exception, with its social programs dramatically reducing the poverty impacts of the COVID-19 shock.

2. Methodology

The distributional impacts of the COVID-19 shock are estimated as the difference in simulated welfare outcomes in 2020 under two scenarios (Figure 1). The first, the counterfactual or business-as-usual (BAU) scenario, assumes that 2019–20 real GDP growth follows its pre-COVID trend. The second, the COVID-19 scenario, uses the latest estimates of the sectoral GDP growth made available by the Macroeconomics, Trade, and Investment (MTI) Global Practice at the World Bank. This latter scenario does not capture any government policy implemented to mitigate the welfare impacts of the COVID-19 shock, other than through its impact on sectoral output. The household welfare differences between these two scenarios indicate the distributional impacts of the COVID-19 shock. We then simulate the extent to which key social protection (SP) programs would have reduced the poverty impacts in the COVID-19 scenario. In addition, the comparison of welfare outcomes between the 2019 baseline scenario and the COVID-19 shock scenario can be used to estimate before-after poverty impacts.

Figure 1. Framework of the Micro Simulation
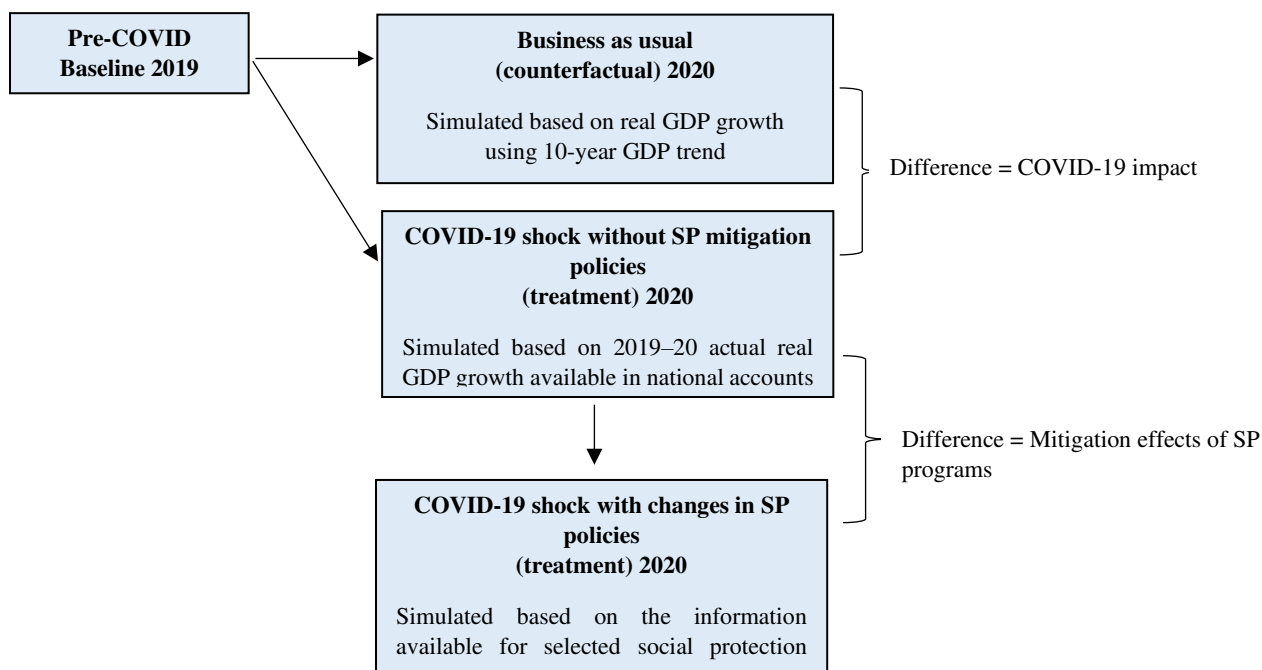
Note: GDP = gross domestic product; SP = social protection.

Our macro-micro simulation approach (Figure 2) follows Bourguignon, Bussolo, and Pereira da Silva (2008), Ferreira et al. (2008), and Olivieri et al. (2014).[2] The baseline input micro-data are the official HIES collected in the Marshall Islands (2019/20), Vanuatu (2019/20), Fiji (2019/20), and Kiribati (2019/20). The

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[2] The macro-micro simulation approach has been applied to various distributional impact analyses of macroeconomic shocks, such as in the analysis of the economic crisis in Brazil in 2016–17 by Skoufias, Nakamura, and Gukovas (2017).

method essentially takes existing 2019 household surveys as a starting point (baseline year) and uses projections on several macro indicators to simulate the consumption distribution in 2020 under different macro scenarios.

We first use estimates from an occupational choice model to simulate changes in labor force status that match the sectoral employment distributions at the macro level. If employment in a sector fell, we select workers with the lowest probability to be employed as those leaving the job.[3] For those individuals who become unemployed/employed or switch sector, we simulate their pre-shock labor income changes based on an earnings model using the standard Mincer equation (for each economic sector and skill level). We then change all workers' labor incomes based on changes in real sectoral GDP. Although labor market changes are the main transmission channel used in the model, we also account for changes in international remittances and population growth, and make some assumptions regarding non-labor income.[4] In particular, we assume that capital income grows at the same rate as real GDP, while other non-labor income is constant in real terms at the baseline level (for example, social assistance transfers). Finally, simulated household income changes are converted to consumption changes based on each household's income-consumption ratio at the baseline. We estimate poverty rates based on the simulated household consumption per capita using international poverty lines: the lower-middle-income poverty line (US$3.2 per day in 2011 PPP) and the upper-middle-income poverty line (US$5.5 per day in 2011 PPP). According to the World Bank classification of countries, Fiji and the Marshall Islands are considered upper-middle-income countries, whereas Kiribati and Vanuatu and classified as lower-middle-income countries.

The simulation model attempts to replicate macro changes at the micro level (that is, individuals and households in the HIES data), in a top-down manner. The key macro-level inputs used in the simulations are sectoral GDP, employment, and remittances real changes between 2019 and 2020. Given that employment projections for 2020 are not available in most countries, we apply sector GDP-employment elasticities (estimated from historical data) to the available sectoral GDP growth estimates to generate changes in employment by sector.[5] Although the results of the simulations already capture price changes as reflected in real GDP growth, household consumption baskets may face different inflation than the general inflation from the consumer price index (CPI) depending on their composition.[6] We account for this possibility by adjusting poverty lines for additional inflation (2 percent) when measuring poverty (Figure A3 in annex).

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[3] We employ a multinomial logit model on all working-age individuals, separately for low and high skill levels. Each individual must choose from five alternatives: being inactive, unemployed, or being in an economic sector (agriculture, industry, or services).

[4] Data on international remittances come from KNOMAD (2021). Population data come from the United Nations World Population Prospects 2019.

[5] Employment trends used for the elasticity calculations come from ILOSTAT/WDI (database) for Fiji and Vanuatu, and from the national account report for the Marshall Islands. Kiribati's employment trend is calculated based on the 2006 and 2019/20 HIES.

[6] This might occur if there is a difference in food and non-food inflation rates between the baseline and target years. For example, if food inflation has outpaced non-food inflation.

Figure 2. Modeling Process
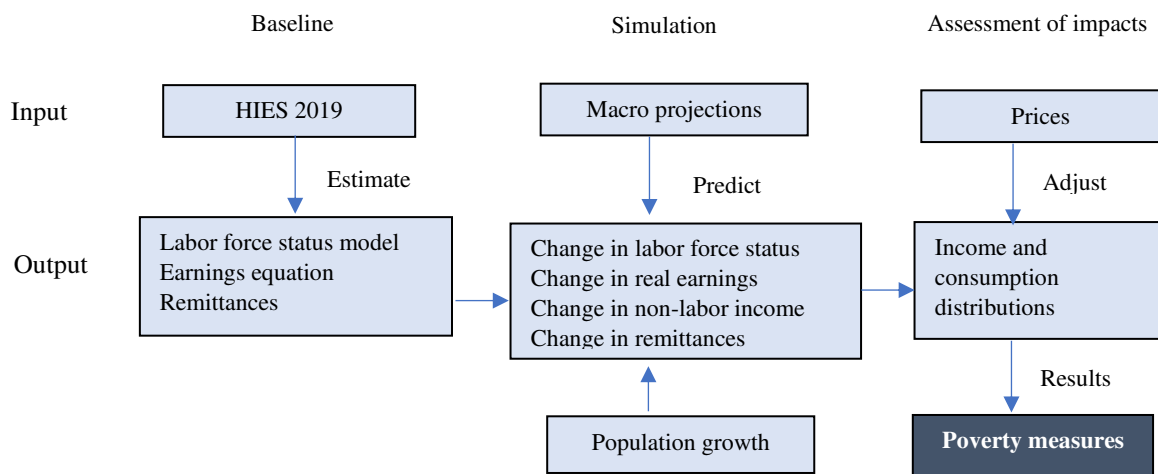
Source: Original figure based on Olivieri et al. 2014.
Note: HIES = household income and expenditure surveys.

The simulation results presented in the following sections are based on a three-sector model, which includes agriculture, industry, and services. Additionally, given the importance of the tourism sector in the PICs and that it has been one of the hardest hit sectors by the pandemic, we estimate a four-sector model that distinguishes tourism from other services. Tourism GDP and employment trends are calculated using data from World Travel and Tourism Council (WTTC) reports. Because of limited data availability, we can only estimate this four-sector model for Fiji, Kiribati, and Vanuatu.

Box 1. Key Assumptions in the Model

The macro-micro simulation analysis in this note hinges on various assumptions that impose certain limitations and caveats for the interpretation of the results. Key assumptions are summarized below.

Table B1.1. Key Assumptions and Limitations in the Macro-Micro Simulation Approach

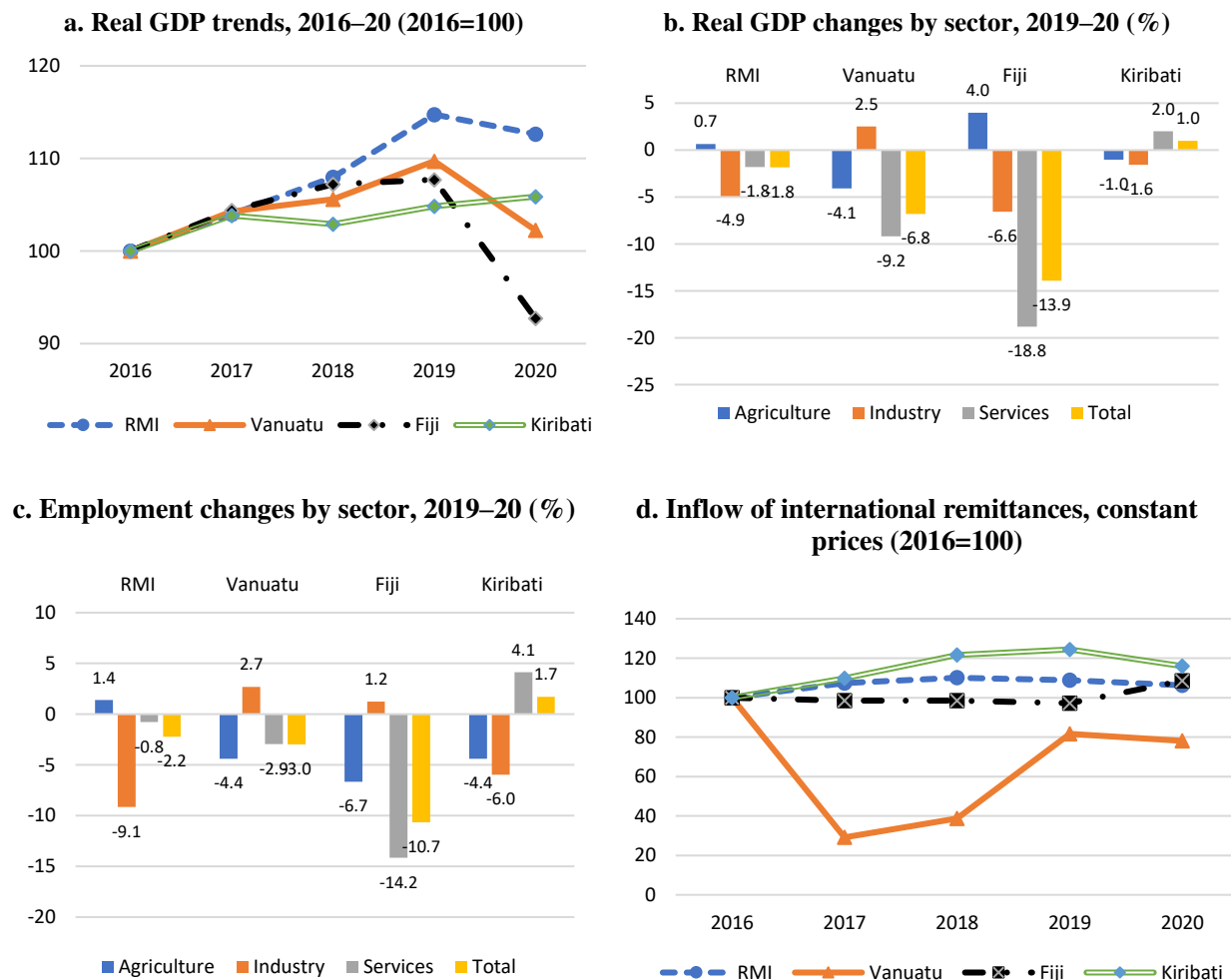| Category	Assumption
Macro projections	• The quality of estimations from the model depends on the nature and accuracy of the data underpinning the exercise, such as the macroeconomic projections. In addition, the lack of availability of more disaggregated projections constrains the ability to account for heterogeneity within each sector. • Employment changes between 2019 and 2020 are estimated based on the historical elasticities between GDP and employment changes. Therefore, it creates a strong assumption that such elasticities during a pre-crisis period are applicable to the period with COVID-19 shocks. • Because sectoral GDP projections for 2021 are not available, the macro-micro simulation only analyzes the very short-term COVID-19 impacts in 2020. It is possible that household welfare continued deteriorating in 2021.
Labor market structures	• The simulation model assumes that the structure of labor markets and household incomes and their relationships with demographics remain constant, not allowing for any changes over time or between scenarios. However, it is possible that COVID-19 shocks have altered these relationships. • The model assumes that changes in labor market conditions are proportional to the projected change in outputs, based on the estimated past relationship between output and employment. This method implicitly assumes stable relationships between outputs, demand for labor, and labor earnings. However, employment changes may not have fully followed output changes due to, for example, subsidies to businesses and work retention programs.
Geographic mobility	The model does not allow for geographic mobility of factors (labor or capital) across time or scenarios. Thus, all individuals are assumed to remain at their place of origin, even if they experience a change in economic sector or employment status.[a]
Price effects	The model is limited in its ability to account for shifts in relative prices between different sectors of the economy resulting from the shock. Although the poverty impact of shifts in the price of food relative to other prices is taken into account, other potential sources of price impacts are ignored—for example, the general equilibrium effect of a change in the terms of trade between agriculture and other sectors.
Income to consumption ratios	To provide poverty projections, household incomes must be converted into consumption using the assumption that a household's propensity to consume is constant over time and across scenarios.

a. However, anecdotal evidence across the PICs suggests that tourism workers who lost their jobs during the pandemic migrated to rural areas as a coping strategy.

3. Macro Projections

Several macroeconomic indicators show a severe negative impact of COVID-19 in the economy of the analyzed PICs (Figure 3 and

Figure 4). Real GDP growth sharply declined in 2020 in Fiji (13.9 percent) and in Vanuatu (6.8 percent), and less starkly in the Marshall Islands. In all but Kiribati, the largest drop in output occurred in the services sector. These trends are translated to employment through the GDP-employment elasticities. Within the services sector, tourism experienced a particularly large drop in both real GDP and employment. Real tourism GDP declined by 69.5 percent in Vanuatu, 76.7 percent in Fiji, and 47.4 percent in Kiribati; employment in the tourism sector dropped by 33.7 percent in Vanuatu, 29.3 percent in Fiji, and 20.4 percent in Kiribati. Despite the projected decline in aggregate income, households were able to receive remittances to cope with the COVID-19 shock. Data show that the inflow of international remittances did not exhibit major changes between 2019 and 2020 (in real terms) in most of the PICs.[7]

Figure 3. Macroeconomic Trends by Three Sectors

a. Real GDP trends, 2016–20 (2016=100)

b. Real GDP changes by sector, 2019–20 (%)

c. Employment changes by sector, 2019–20 (%)

d. Inflow of international remittances, constant prices (2016=100)

Sources: GDP trends from national accounts (panels a and b); authors' employment estimates based on historical GDP-employment elasticities (panel c); inflow of international remittances (in real terms) from KNOMAD 2021 (panel d).
Note: Aggregate GDP is calculated as the sum of sectoral GDP. RMI = Republic of the Marshall Islands.

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[7] See World Bank (2021).

Figure 4. Macroeconomic Trends by Four Sectors

a. Real GDP changes by sector, 2019–20 (%)

b. Employment change, 2019–20 (%)

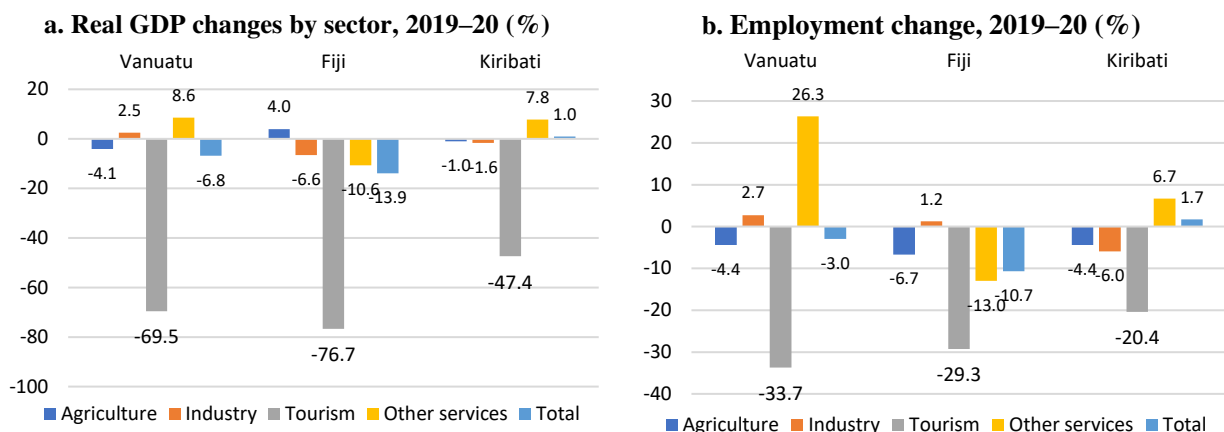*Sources*: GDP trends from national accounts (panel a); authors' employment estimates based on historical GDP-employment elasticities (panel b). Tourism GDP and employment trends are calculated based on the WTTC Economic Impact Report (https://wttc.org/Research/Economic-Impact).

Note: The large increase in the employment in Vanuatu's non-tourism service sector is due to the combination of the reduction in the total service-sector employment and the large share of the tourism-related jobs in the service sector, as the employment "other services" is calculated as the residual (that is, the total employment in the service sector minus tourism employment). We assume that many tourism workers switched to non-tourism service jobs during the early pandemic period.

4. Results

Poverty trends prior to COVID-19 pandemic

➢ **Backed by GDP growth, poverty rates are estimated to have gradually declined in the four analyzed PICs between 2016 and 2019.**

According to the results of the macro-micro simulations, the poverty rates in the four PICs gradually declined from 2016 to 2019, in tandem with their real GDP growth. In Vanuatu, the poverty rate is projected to have decreased from 32.7 percent in 2016 to 32.0 percent in 2019, based on the lower-middle-income poverty line. Kiribati's poverty rate is also expected to have declined from 20.3 percent to 16.4 percent during this period. Based on the upper-middle-income poverty lines, the poverty rates in the Marshall Islands and Fiji potentially declined from 29.5 percent to 22.9 percent and from 54.5 percent to 48.1 percent, respectively, during the same period.

COVID-19 impacts on poverty (excluding changes in social protection programs implemented in 2020)

➢ **In the absence of changes in SP programs and other mitigation policies, COVID-19 and concurrent climate shocks would have substantially increased poverty rates in the four PICs in 2020, relative to business as usual. Fiji would have been the most severely affected country (a 8.7 percentage point increase), followed by Vanuatu (a 6.0 percentage point increase), based on the US$3.2 poverty line.**

The projected economic contractions could translate into an increase of the poverty rate relative to a scenario for 2020 without the combined shock, by 2.0 percentage points in the Marshall Islands, 6.0 points in Vanuatu, 8.7 points in Fiji, and 1.0 point in Kiribati, based on the lower-middle-income poverty line

(US$3.2 per capita per day in 2011 PPP terms) (Figure 5, panel a).[8] For example, Vanuatu's poverty rate in 2020 is projected at 31.5 percent under the BAU scenario and 37.5 percent under the COVID-19 scenario (without SP), the difference (6.0 percentage points) indicating the COVID-19 and Cyclone Harold impacts. Except for Kiribati, the simulated poverty rate for 2020 is higher than the poverty level back in 2016. That is, in the absence of government mitigation policies, the PICs could lose at least four years of gains in poverty reduction.

Figure 5. Simulated Poverty Rates Based on Three-Sector Models

a. Poverty rates based on US$3.2 poverty line (%)

b. Poverty rates based on US$5.5 poverty line (%)
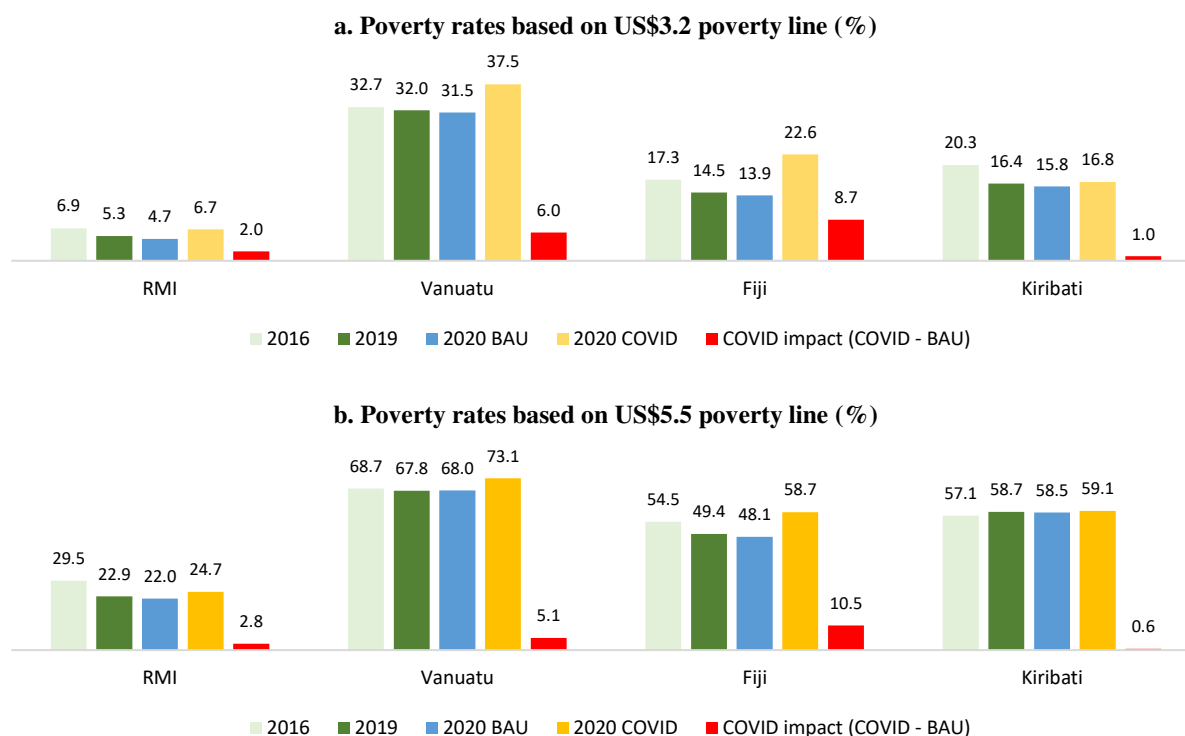
Source: Original calculations using the ADePT simulations interface.
Note: Poverty rates for 2020 are simulated without considering changes in social protection programs implemented in 2020. BAU = business as usual; RMI = Republic of the Marshall Islands.

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[8] The smaller COVID-19 impact on poverty in Kiribati is partly explained by the fact that real GDP was not much affected in this country. By contrast, the sharp GDP decline (13.9 percent) in Fiji severely impacted poverty in that country.

Box 2. Household Expenditures and Poverty at Pre-COVID Baseline

Poverty and vulnerability conditions prior to the COVID-19 pandemic varied among Pacific Island countries. Countries with a large share of people living just above the poverty line are expected to experience large poverty impacts from economic shocks, because small changes in expenditure may be enough to cross the poverty line. Indeed, Fiji and Vanuatu, in addition to experiencing the largest economic losses, had in 2019 around a third of the population living right above the poverty line, with daily per capita expenditures between US$3.20 and US$5.50 (Figure A1 in annex).

Table B2.1. Poverty and Vulnerability Status in 2019 (%)

	Population share by expenditure level		
	< US$3.2	US$3.2–US$5.5	> US$5.5
Marshall Islands	5.3	17.6	77.1
Vanuatu	32.0	35.8	32.2
Fiji	14.5	34.9	50.6
Kiribati	16.4	42.3	41.3

Note: Poverty is estimated based on 2019 HIES for the Marshall Islands, Vanuatu, Fiji, and Kiribati.

> ➢ **The projected rise in poverty rates above corresponds to a substantial increase in the number of poor living in the four PICs: 92,500 new poor (40.5 percent increase) at the US$3.2 poverty line between 2019 and 2020.**

Between 2019 and 2020, the total number of people in the four PIC countries living in poverty is estimated to have increased by approximately 92,500, 40.5 percent higher than in 2019. Estimates suggest that in 2020 there would be 71,100 new poor in Fiji, 19,400 in Vanuatu, 1,100 in the Marshall Islands, and 800 in Kiribati. These massive increases in poverty offset the poverty reduction achieved since 2016—the total number of poor in the four countries had decreased by 20,800 (-7.9 percent) between 2016 and 2019.

> ➢ **Based on the US$5.5 poverty line, the COVID-19 shock could translate into a 10.5 percentage point increase in the poverty rate in Fiji and a 5.2 percentage point increase in the Marshall Islands. As a result, the number of poor individuals could increase between 2019 and 2020 by 77,000 and 2,500 in each country, respectively.**

Similar conclusions emerge when using the upper-middle-income poverty line (US$5.5). The COVID-19 impact on poverty is estimated to be the severest in Fiji: a 10.5 percentage point increase in the poverty rate (Figure 5, panel b). COVID-19 impacts on poverty are estimated to be around 2.8 percentage points in the Marshall Islands, 5.1 points in Vanuatu, and 0.6 points in Kiribati. The total number of poor living in the four countries increased between 2019 and 2020 by 102,800, or 13.5 percent. Fiji and the Marshall Islands, the only upper-middle-income countries among the four, contributed 77,000 and 2,500 new poor, respectively.

For robustness, we estimate poverty rates under different relative food and non-food inflation scenarios. In particular, we model a 1–2 percent increase in the international poverty line. Higher price increases result in higher poverty impacts by about 1 percentage point (Figure A2 in annex).

As an alternative robustness check, we compare the poverty estimates from the macro-micro simulation approach with the poverty projections published by the World Bank using the neutral distribution method (World Bank 2022). Overall, we find similar trends when comparing both approaches (Figure A4 in annex).

Contribution of the tourism sector to poverty changes

National-level poverty estimates remain almost unchanged when using the four-sector model, which analyzes the tourism sector separately from the services sector (Figure A5 in annex).[9] Still, an interesting question is the extent to which the tourism sector might have contributed to poverty changes prior to and during the pandemic. We decompose changes in national-level poverty rates between 2019 and 2020 into intra-sectoral effects (indicating poverty changes within each sector), inter-sectoral effects (or population shift effects, indicating poverty changes accountable for the changes in population shares across sectors), and their interactions.[10] We are particularly interested in the intra-sectoral effects, as these indicate how much each sector contributed to national poverty changes during the period under analysis, keeping constant the baseline population shares across sectors.

> ➢ **The tourism sector was particularly, severely hit by the pandemic: while only representing less than 10 percent of employment, it drove a quarter to a third of the poverty increase between 2019 and 2020 in Fiji and Vanuatu—and nearly all of the increase in Kiribati.**

As expected, the tourism sector accounted for a large share of the estimated poverty increases between 2019 and 2020 (Figure 6). For example, the tourism sector accounted for a 1.5, 2.5, and 0.9 percentage point increase in poverty rates in Vanuatu, Fiji, and Kiribati, respectively—accounting for about a quarter to half of the total poverty increases. Given the small employment shares of the sector in these countries—about 5 percent in Fiji and Kiribati and 10 percent in Vanuatu according to WTTC data—the scale of the poverty contributions is sizable.[11]
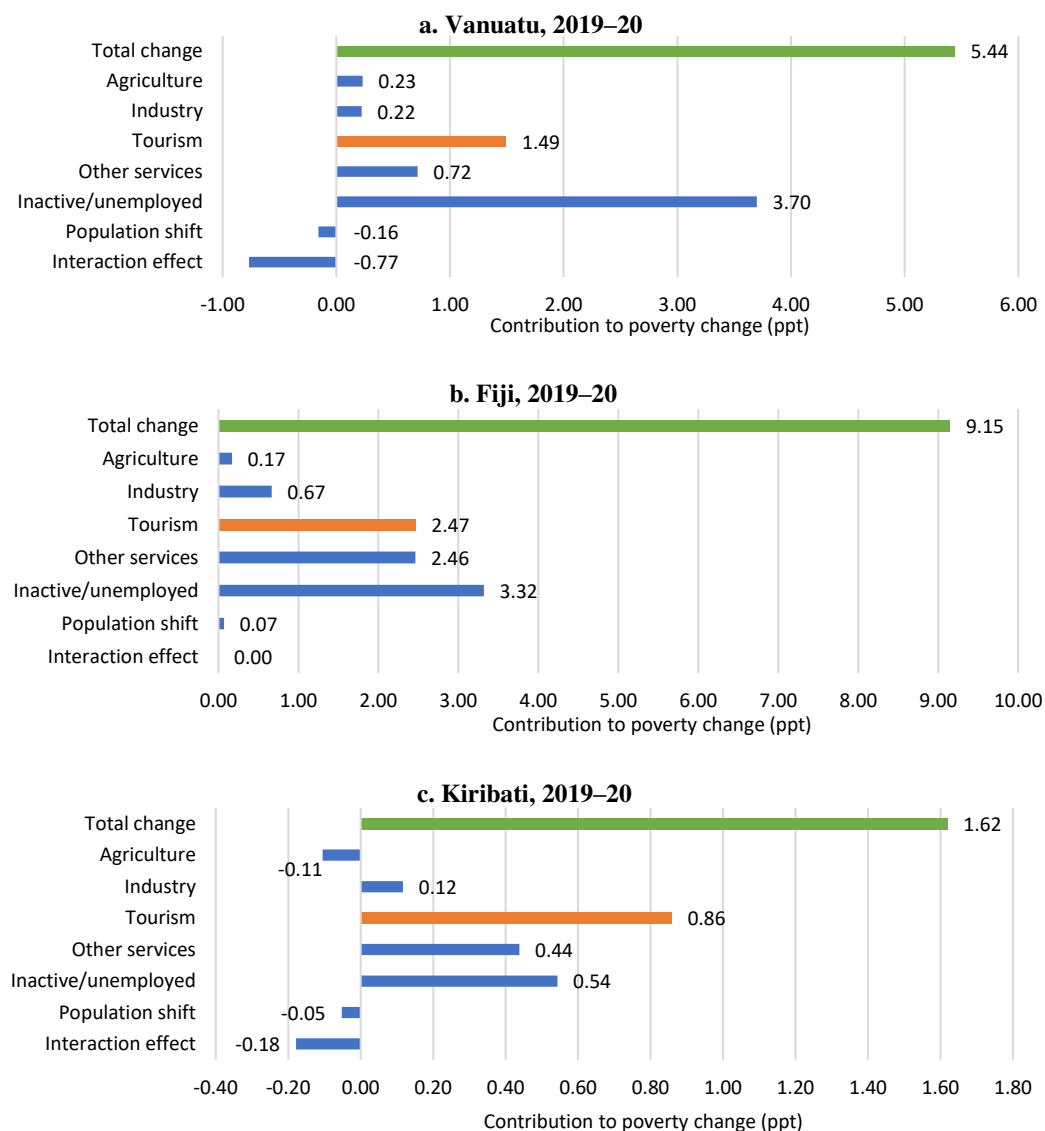
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[9] Except for Fiji and Kiribati, where the COVID-19 impacts on $3.2 poverty rates are estimated to be slightly higher than under the three-sector model.

[10] To do so, we follow the methodology proposed by Ravallion and Huppi (1991).

[11] Poverty was the lowest in the tourism sector before the COVID-19 shock. The large contribution of this sector to the estimated poverty increases in 2020 implies that most Fijians working in the tourism industry became poor as a result of the pandemic.

Figure 6. Contribution of Tourism Sector to Poverty Changes (ppt)

a. Vanuatu, 2019–20

Category	Value
Total change	5.44
Agriculture	0.23
Industry	0.22
Tourism	1.49
Other services	0.72
Inactive/unemployed	3.70
Population shift	-0.16
Interaction effect	-0.77

Contribution to poverty change (ppt)

b. Fiji, 2019–20

Category	Value
Total change	9.15
Agriculture	0.17
Industry	0.67
Tourism	2.47
Other services	2.46
Inactive/unemployed	3.32
Population shift	0.07
Interaction effect	0.00

Contribution to poverty change (ppt)

c. Kiribati, 2019–20

Category	Value
Total change	1.62
Agriculture	-0.11
Industry	0.12
Tourism	0.86
Other services	0.44
Inactive/unemployed	0.54
Population shift	-0.05
Interaction effect	-0.18

Contribution to poverty change (ppt)

Source: Original calculations using the ADePT simulations interface.
Note: Poverty is measured based on the US$3.2 poverty line using the four-sector model.

Effects of social protection programs

➢ **Mitigation policies, such as expansions of existing social protection programs, have provided cushions against COVID-19 shocks, yet the support was not enough to fully absorb the poverty impacts in most of the analyzed countries.**

Governments across the Pacific have implemented various measures to mitigate the impact of COVID-19 and climate shocks on households' welfare (listed in

Table in annex). The government of Vanuatu distributed through the Cash Transfer Program (CTP) a credit of VT 238 million (approximately US$2 million) to 3,745 beneficiaries between October 2020 and May 2021. In the Marshall Islands, US$6.7 million of monetary support (2.7 percent of GDP) was provided to unemployed individuals under the US CARES Act between 2020 and 2021. In Fiji, the government provided top-ups to recipients of the main social assistance programs between August and September 2020, as well as several income support programs to those who lost their jobs or were on a reduced schedule in both the formal and informal sectors.[12] Kiribati's government distributed a sizable amount of money (7.9 percent of GDP) to the unemployed and the elderly though new and existing social assistance programs, though not intentionally as a response policy to COVID-19 shocks. To assess the mitigation effects of such policies, we use the simulated 2020 data after the COVID-19 and climate-related shocks and conduct a post-simulation analysis by distributing the programs' payments among the eligible individuals and households.[13]

Results indicate that these programs may have reduced the projected poverty impacts of COVID-19 by 0.4 percentage points in the Marshall Islands (US$5.5 poverty line) and 0.3 points in Vanuatu (US$3.2 poverty line) (Figure 7).[14] However, they were insufficient to entirely absorb the impacts of the COVID-19 and climate-related shocks, both in terms of number of beneficiaries and benefits provided. In the Marshall Islands, while the payment per beneficiary was generous, the number of beneficiaries was low and limited to those who lost formal jobs during the pandemic—who were not necessarily living in poor households.[15] In Vanuatu, the CTP benefited 3,745 households across three regions (Sanma, Tafea, and Shefa). According to the simulation results, about 12,160 households would have been poor in those regions, among which 2,700 households became newly poor. Thus, under the assumption of perfect targeting, the CTP could have fully covered the new poor. Nevertheless, only 30 percent of poor households in these three regions—or 18 percent of poor households nationwide—would have been covered by the program. Moreover, the allowance (VT 70,000 [around US$600] per beneficiary household) was too small to cushion poverty impacts. On average, poor households would have needed VT 293,500 to fill the gap in their budget to escape poverty.[16] In other words, cash transfers with the total amount equivalent to about 1 percent of GDP need to be allocated to fully support the new poor, instead of 0.2 percent by the CTP.

The emergency spending response in Fiji is estimated to have kept the increase in poverty at single-digit levels (Figure 7), offsetting more than half of the projected poverty increase without this support. Still, poverty (US$5.5 poverty line) is projected to have increased by 4.3 percentage points as a result of the COVID-19 pandemic and several climate-related shocks. Fiji used two main social assistance programs, one a contributory unemployment insurance for formal workers and one noncontributory; the two programs

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[12] Top-ups were provided to the following social assistance programs: Disability Allowance, Social Pension Scheme, Poverty Benefit Scheme, and the Care and Protection Allowance. Formal workers who became unemployed were allowed to withdraw a preestablished amount of funds from their Fiji National Provident Fund (FNPF) General Account. FNPF members who did not have sufficient funds in their accounts received a top-up from the government. Informal workers received, on average, a relief payment of about FJ$128.

[13] We analyzed only the programs that directly provide payments or credits to individuals and households. Therefore, we do not consider, for instance, subsidies to businesses affected by COVID-19. When the number of eligible individuals is larger than the number of beneficiaries from admin data, we randomly allocate the program's benefits among the eligible individuals. For robustness, multiple random draws are done, and the impacts averaged across them.

[14] The simulated effects of Vanuatu's CTP consider only three-month installments (VT 30,000) as the program started in October 2020. If we simulate the effects of full installments (VT 70,000), poverty rates would decrease by 1.7 percentage points ($3.2 poverty line) and 1.1 percentage points ($5.5 poverty line).

[15] The Marshall Islands could have maintained its pre-COVID poverty level if the budget of the unemployment program had been distributed to only poor individuals.

[16] The lower-middle-income poverty line ($3.2) is equivalent to VT 158,000 per capita per year.

complemented each other by covering different populations, thus expanding their reach. The Fiji National Provident Fund (FNPF) unemployment program for formal workers covered around 97,000 individuals, representing just 11 percent of the population.[17] Under the assumption of perfect targeting of the poor, only 19 percent of them would have been covered by the program. Although relatively few individuals received assistance from this program, those who did benefited substantially. The FNPF unemployment benefit per capita (including withdrawals from members' accounts) was 1.3 times the average consumption per capita in Fiji.[18] In fact, total spending on this program is similar to the government budget allocated to operating health expenditures and represents about three quarters of the funds needed to eradicate poverty in Fiji.[19] Conversely, the coverage of the unemployment program for the informal sector was much larger, at about 29 percent of the population, but benefits per capita were relatively small, representing about 5 percent of the upper-middle-income poverty line. Total spending on this program was close to the budget allocated to the Poverty Benefit Scheme, Fiji's main social assistance program, but coverage was 10 times greater, resulting in a relatively small benefit per capita. Income support programs in Fiji accounted for about 3.7 percent of GDP.[20]

The social assistance programs implemented in Kiribati dramatically reduced poverty, more than compensating for the expected poverty increase because of COVID. In fact, the poverty headcount rate is projected to have fallen below its pre-pandemic level and even below the rate in 2016. Both the unemployment and the senior citizen benefits are considerably large in terms of coverage and amount disbursed. Established in September 2020, the support fund to the unemployed provided eligible beneficiaries with a monthly allowance of AU$50 for four months [around US$140], accounting for 76 percent of the average funds a poor individual would need to escape poverty.[21] In 2020, it is estimated that about 42 percent of the population benefited from this program.[22] This included 41 percent of Kiribati's poor (about 8,258 individuals). These estimates are in the upper bound, as they assume that all eligible beneficiaries signed up at the start of the program and received the cash benefits on time.[23] The expansion of the senior citizen benefit, from AU$50–60 to AU$200 per month, is 6.4 times the average individual poverty gap and 1.72 times the average consumption per capita of the poor. This program covered about 1,444 poor individuals in 2020 out of a total of 20,201 poor. Although the expansion in social protection was crucial to mitigate the impact of COVID-19 on households, it was not originally designed as a response to the shock. This policy reform package was part of Kiribati's increased budget on social protection.

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[17] Formal workers were less likely to be poor prior to the COVID-19 shock, compared to informal workers.

[18] Average consumption per capita is calculated using the 2019/20 HIES.

[19] Operating health expenditures are obtained from the 2020–21 budget estimates. Poverty is measured based on the upper-middle-income poverty line.

[20] This includes FNPF withdrawals from members' general accounts and excludes regular payments from existing social protection programs.

[21] The 2020 allowance (distributed for just four months) accounts for 21 percent of the average annual consumption per capita among the poor. In fact, the total amount disbursed by the program is greater than the funds needed to lift all the poor out of poverty. That is, if the program was designed to target the poor, it could eliminate poverty in the country.

[22] Eligible beneficiaries are all citizens ages 18 to 59 who are not formally employed or in a government-sponsored training program (including employees, self-employed, and employers). Still, it is uncertain the extent to which the labor formality restriction was applied to verify eligible applicants. Lack of a unique ID and data interoperability were the main constraints that prevented checking the unemployment status of the applicants.

[23] Anecdotal evidence suggests massive payment backlogs owing to cash logistics that impeded a smooth distribution of the benefits and the timely start of the program. In addition, enrollment was gradual and thus the number of beneficiaries might have been lower during the early days of the program.

Figure 7. COVID-19 Impacts on Poverty, with and without Expansion of Social Protection Programs (ppt)
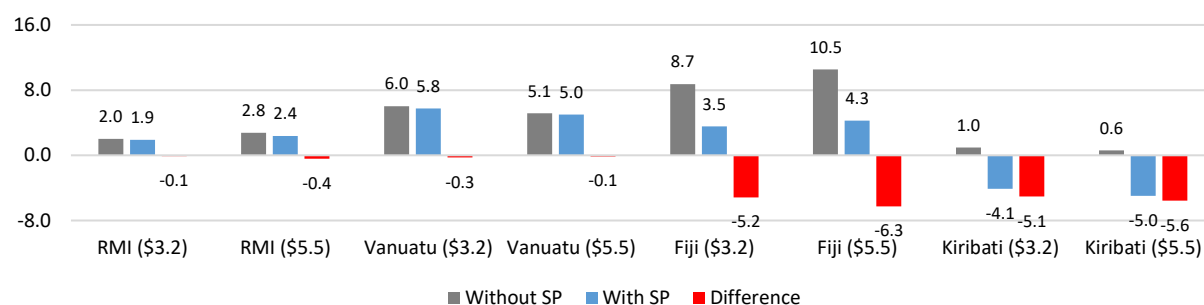
Source: Original calculations using the ADePT simulations interface.
Note: US$3.2 and US$5.5 refer to lower-middle-income and upper-middle-income international poverty lines. Poverty impacts are estimated as the difference in poverty rates between the COVID-19 and BAU scenarios. RMI = Republic of the Marshall Islands; SP = social protection.

5. Conclusion

The results of the macro-micro simulations presented in this note suggest that without governments' implementation of mitigation measures, COVID-19 and Cyclone Harold would have severely increased poverty in 2020 among the four PICs. In particularly hard-hit countries, such as Fiji and Vanuatu, poverty rates would have increased by 6 percentage points or more, compared to the business-as-usual scenario. In total, the number of poor individuals in these four countries is estimated to have increased by 92,500 (equivalent to a 40.5 percent increase) between 2019 and 2020. Poverty levels in most of the analyzed countries are expected to be higher than those in 2016 and are not likely to return to the pre-pandemic level in a couple of years.

The findings also highlight the importance of expanding social protection assistance both in terms of benefits and coverage to mitigate the poverty impacts of COVID-19 and climate-related shocks. After accounting for some of the key social protection programs implemented in 2020, our results show that poverty impacts are likely to have been negated in Kiribati and more than halved in Fiji. However, the programs in the Marshall Islands and Vanuatu appear insufficient to offset the projected increases in poverty because of their limited coverage and amount disbursed, as well as narrow targeting. For the Marshall Islands, while the payment per beneficiary was generous enough, the number of beneficiaries was too small to fully offset the poverty increase. In Vanuatu, both benefits per capita and the number of beneficiaries— including those who live outside the targeted three regions—would need to be increased to offset the welfare impact on households. Identifying and providing support to severely affected workers and households will remain an important policy agenda.

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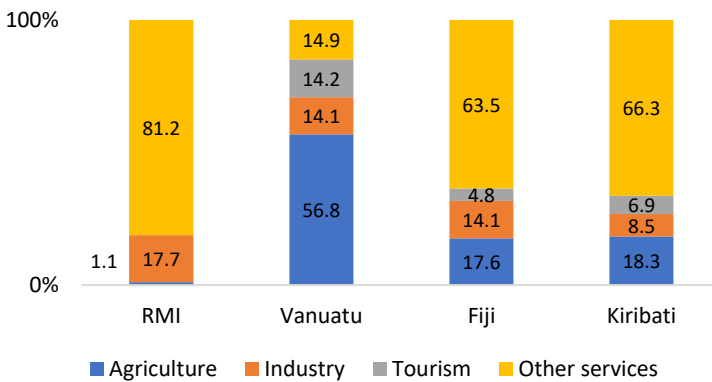
Annex

Figure A1. Cumulative Density Function of Household Expenditures at Pre-pandemic Baseline
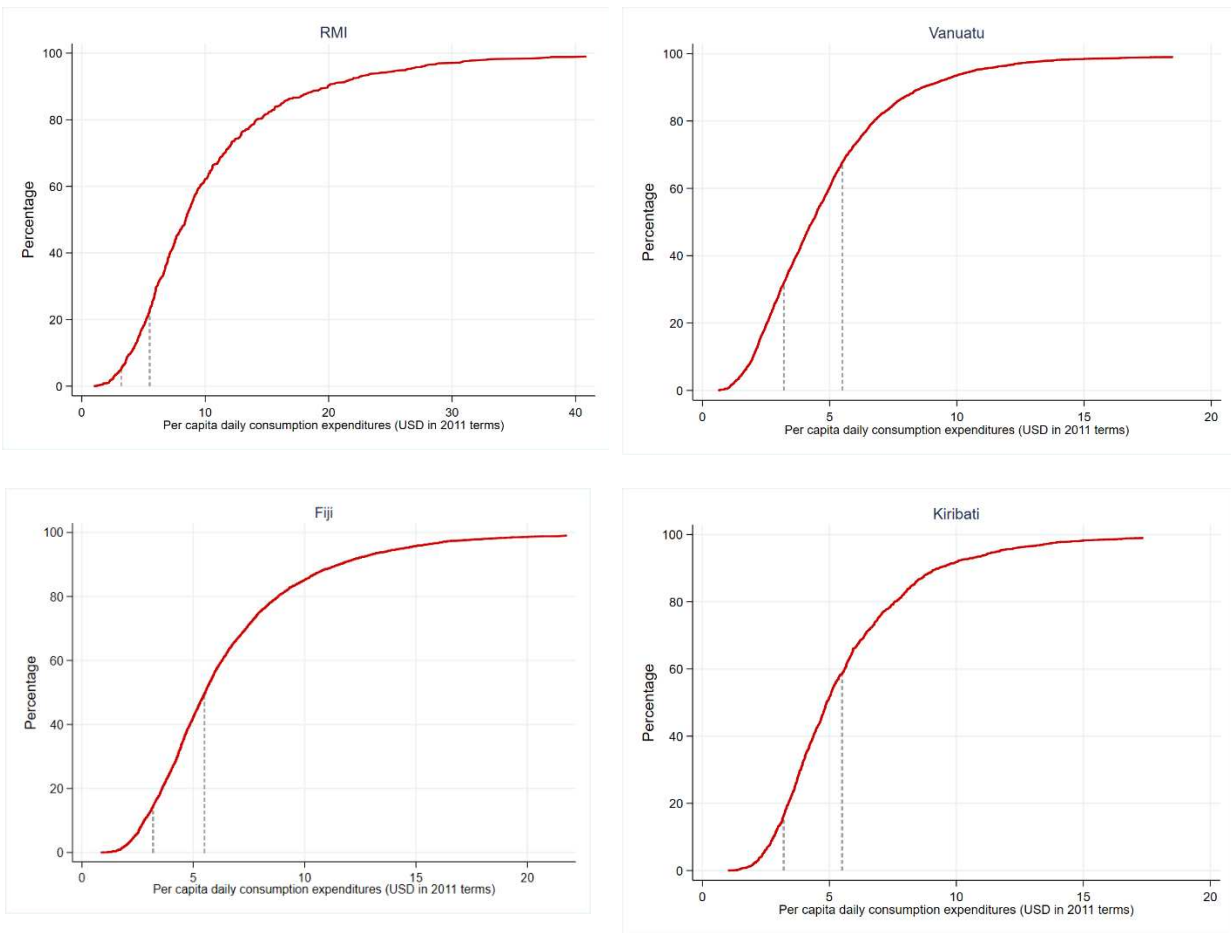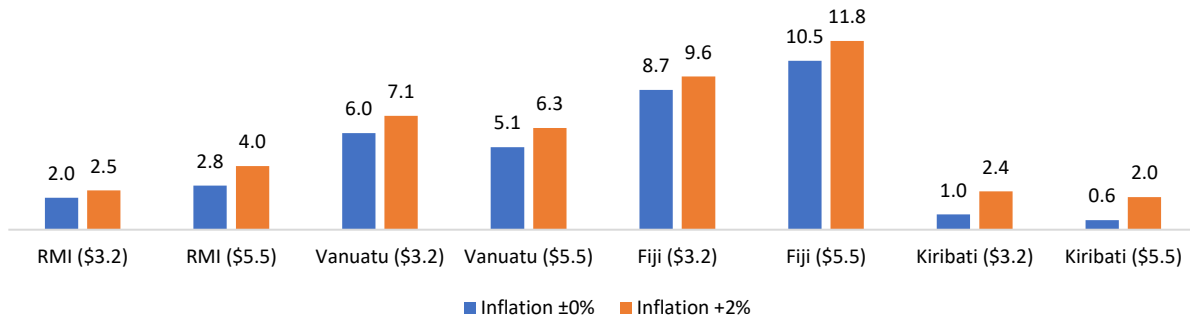

Source: Original calculations using 2019 HEIS data.
Note: The vertical dotted lines indicate the lower-middle-income (US$3.2) and upper-middle-income (US$5.5) poverty lines.

**Figure A2. Share of Workers by Sector, 2019**

Source: ILOSTAT/WDI database for Vanuatu and Fiji; the national account report for RMI; 2019/20 HIES for Kiribati. Employment in tourism is calculated based on the WTTC Economic Impact Report (https://wttc.org/Research/Economic-Impact). RMI = Republic of the Marshall Islands.

Figure A3. COVID-19 Impacts on Poverty under Different Relative Inflation Scenarios (ppt)
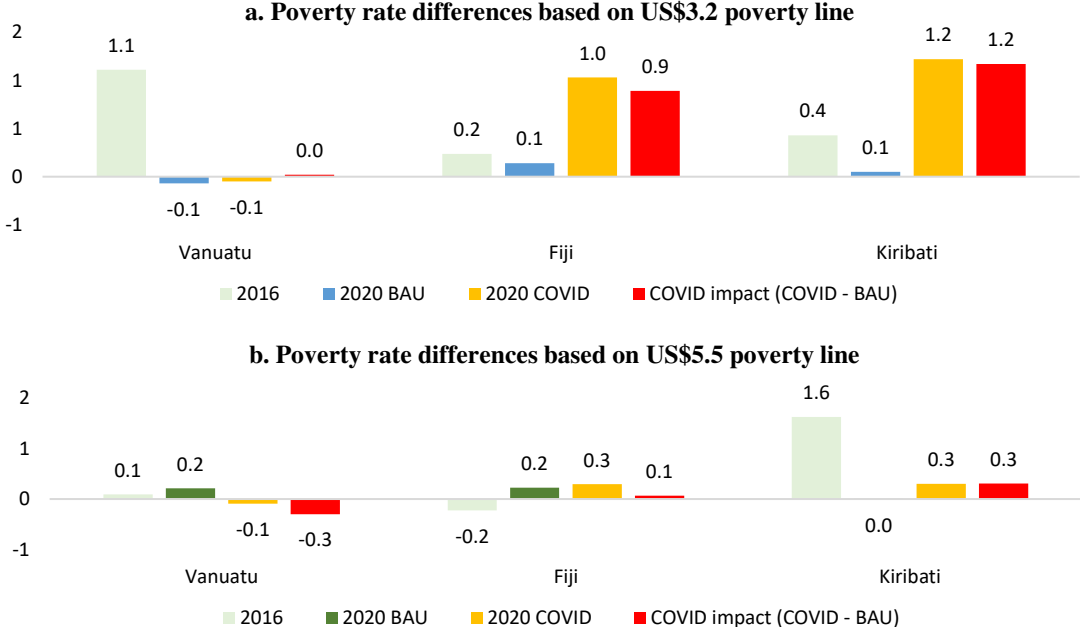

Source: Original calculations using the ADePT simulations interface.
Note: RMI = Republic of the Marshall Islands.

Figure A4. Comparison of Poverty Estimates between the Macro-Micro Simulation Approach and the Neutral Distribution Approach
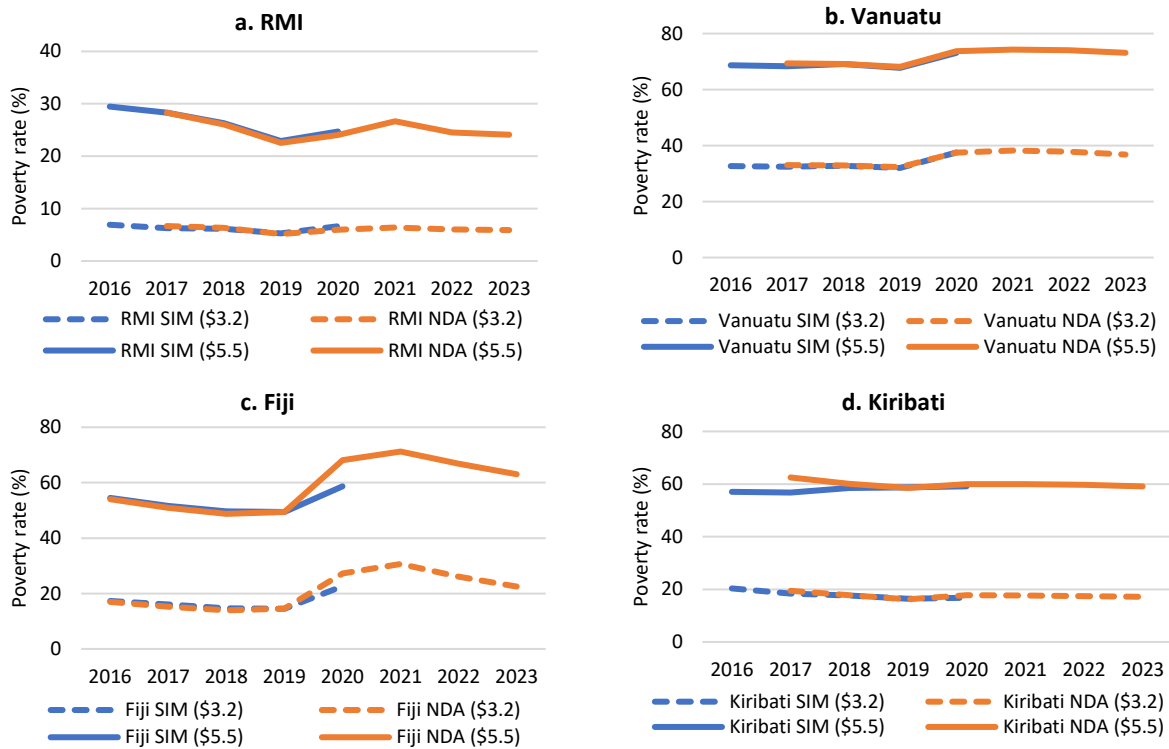
Source: Original calculations using the ADePT simulations interface and poverty projections in World Bank 2022.
Note: SIM = Macro-micro simulation. NDA = Neutral distribution approach.

Figure A5. Differences in Simulated Poverty Rates between Four-Sector and Three-Sector Models

a. Poverty rate differences based on US$3.2 poverty line

Legend: 2016 | 2020 BAU | 2020 COVID | COVID impact (COVID - BAU)

b. Poverty rate differences based on US$5.5 poverty line

Legend: 2016 | 2020 BAU | 2020 COVID | COVID impact (COVID - BAU)

Source: Original calculations using the ADePT simulations interface.
Note: BAU = business as usual.

Table A1. Simulated Changes in Social Protection Programs in 2020

Country	Program
Vanuatu	Under the Cash Transfer Program, VT 237,640,000 was distributed to 3,745 beneficiary households between October 2020 and May 2021.[a] • VT 70,000 was paid in six installments to each eligible household. • Eligible households have members with one of the following characteristics: elderly (age 60 or above); person with disability; single mother; widow; or displaced by Cyclone Harold. • Beneficiaries: 2,530 households in Sanma, 398 households in Tafea, and 817 households in Shefa.
Marshall Islands	Monetary support was provided to unemployed individuals under the US CARES Act. • US$600 per week between April 2020 and July 2020. • US$300 per week between December 2020 and September 2021. • US$166 per week between July 2020 and September 2021. • The number of beneficiaries was reported to be 456.
Kiribati[b]	• Support Fund to the Unemployed was established in September 2020, distributing AU$8.6 million in 2020 and AU$50.5 million in 2021. ○ 52,000 individuals received payments (AU$50 per month) as of May 2021.[c] • Senior Citizen's Benefit (Elderly Fund) was expanded in 2020, with AU$12.1 million disbursed in 2020. ○ Eligibility lowered to all citizens aged 60 or above. ○ Allowance increased to AU$200 per month.[d] ○ Around 7,700 individuals benefited from this program in 2020.

a. For this analysis, we distributed the amount of three installments to randomly selected eligible households.

b. We do not model changes in copra subsidies in 2020 as there was no major expansion between 2019 and 2020. The fixed price of copra stayed at AU$2 per kilogram in both years.

c. Since the program was established in September 2020, we distributed AU$200 (the benefit equivalent to four months) to all eligible individuals. Eligible individuals are those ages 18 to 60 who were not employed in the formal sector in 2020. We define labor formality based on the following criteria: (a) employees and apprentices whose employer makes social security contributions on their behalf; (b) business owners working for the government, state-owned enterprises, incorporated companies, and international organizations; (c) business owners working for private businesses or individual households, but whose business is registered in a national business register.

d. Anecdotal evidence suggests that changes to the Senior Citizen's Benefit were introduced in September 2020. Therefore, we assign to all eligible individuals the benefit equivalent to four months of the program (AU$800). For individuals who were already part of the program in 2019, we assign to them the old benefit for the period January–August 2020 and the new benefit for the period September–December 2020. Although the number of eligible beneficiaries from the HIES almost matches the official statistics, the estimated total amount disbursed through this program (AU$7.4 million) is substantially smaller than that from administrative records (AU$12.1 million). One possible explanation would be that the program was implemented earlier in the year.

Table A1 *continued*

Country	Program
Fiji	Top-ups were provided to recipients of existing social assistance programs (in addition to regular payments) during August and September 2020. Total budget allocated to Social Welfare top-ups was FJ$7.8 million.[a] • Social Pension Scheme: FJ$50 per month • Poverty Benefit Scheme: FJ$100 per month • Child and Protection Allowance: FJ$100 per month • Disability Allowance: FJ$50 per month[b] Income support was provided to individuals who lost their jobs or were on reduced hours in both the formal and informal sectors. • Unemployed in the formal sector were eligible to withdraw FJ$220 per fortnight from their Fiji National Provident Fund (FNPF) General Account, while those on reduced hours were eligible for a pro-rata payment based on the number of days that they did not work. FNPF members who did not have sufficient balance in their general account received assistance from the government. ◦ A total of FJ$387 million was paid to 114,335 members (as of July 2021), of which FJ$205 million was directly paid by the government and the rest withdrawn from member accounts.[c] ◦ As of December 2020, approximately 97,000 individuals benefited from this scheme. For the informal sector, a total of FJ$32 million was paid out to over 250,000 Fijians.[d]

a. Total benefits in the survey are scaled down to match the total budget allocated to Social Welfare top-ups.

b. We do not model this program as we cannot directly identify beneficiaries in the HIES.

c. In this note, we estimate an annual per capita benefit of FJ$3,385 based on official data from the "Economic and Fiscal Update Supplement to the 2021-2022 Budget Address" and distribute it to 97,000 randomly selected eligible individuals. Eligible individuals include all individuals who had a formal job in 2019 but were unemployed in 2020, as well as a subset of those who had a formal job in 2019 and remained employed in 2020. Formal workers are defined as those ages 15 to 55 who are either salary/wage earners or employers.

d. We calculate the equivalent annual per capita benefit (FJ$128) and distribute it to all individuals who worked in the informal sector in 2019, as well as to a random subset of those who were inactive in 2019. Self-employed, family/community workers, and subsistence workers ages 15 to 55 are classified as informal workers.