Fiscal Incidence on the Island

Grenada's Fiscal System and Its Incidence

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Abstract

This paper examines the distributional effects of fiscal policy in Grenada. Using data from the 2017–18 Living Conditions and Household Budgets Survey and following the Commitment to Equity analysis framework, the paper estimates the effects of fiscal policy interventions on inequality and poverty. It analyzes the distributional incidence of direct and indirect taxes, direct transfers provided by social transfers and school feeding programs, and in-kind transfers generated by public services in health and education. The results show that Grenada has a tax system that is neutral on the value-added tax side and progressive on the personal income tax side. Furthermore, direct transfers make a modest contribution to poverty reduction and are almost neutral in their distributive impact. The results contribute to the understanding of who bears the burden of taxation and benefits from transfers and of how Grenada's fiscal system can improve its redistributive effect.

Fiscal Incidence on the Island: Grenada's Fiscal System and Its Incidence[*]

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1. Introduction

Because of their idiosyncratic economic characteristics, small island developing states (SIDS) face greater challenges that elevate the costs associated with delivering public services, including education, health, and social programs. The direct impacts of these challenges have repercussions on public finances, pushing governments to assess and prioritize sectors in determining where to focus their investments (OECD 2018). This problem is aggravated by the vulnerability of SIDS to shocks that limit their domestic revenue generation, largely due to their dependence on tourism activities (OECD 2018). In this context, a fiscal incidence analysis becomes of prime importance, as Lustig (2020) points out.

This paper focuses on Grenada, an SIDS with a population of around 113,000, that is highly dependent on tourism. As a result, the country is vulnerable to climatic shocks and economic downturns in developed countries. Grenada is at high risk for climate-related disasters, ranking third globally in terms of GDP vulnerability and seventh in terms of fatalities per 100,000 inhabitants due to weather-related losses. Approximately one-fifth of the country's population lives below the national poverty line (OECD 2018; World Bank 2021; Grenada, Ministry of Foreign Affairs 2022). The COVID-19 pandemic severely impacted Grenada's economy, particularly its tourism sector, leading to a significant economic contraction and increased unemployment.[1] The government's response measures contained the initial spread of the virus, but subsequent waves caused further economic challenges. Despite some recovery in 2021, Grenada's GDP remains below pre-pandemic levels, and the government had to suspend the fiscal rule for three consecutive years to address the pandemic's extended impacts.[2] The extended impacts of the pandemic have made additional fiscal stimulus necessary (see Appendix A) to support vulnerable groups and maintain economic activities.

The paper examines the redistributive impact of taxes and public spending, following the Commitment to Equity (CEQ) framework (Lustig 2018). The framework aims to provide a comprehensive picture of the redistributive effects of fiscal policies on household income and consumption. Here the CEQ framework is used to assess Grenada's fiscal policies, focusing on pre and post fiscal incomes in order to determine the net beneficiaries and payers of these policies (Lustig 2020). For the Grenada context, a fiscal incidence analysis through the CEQ framework is relevant, because it can provide evidence concerning the extent to which the government's fiscal policies are impacting the welfare of the country's households and inform future policy decisions.

This paper makes multiple contributions to the existing literature. First, we assess the fiscal system of an SIDS, Grenada, which faces resource constraints, natural hazards, and a high poverty rate. These characteristics make it important to determine whether the country's fiscal system has a redistributive impact. Furthermore, Grenada is located in a region where fiscal incidence is understudied. Previous work on Caribbean islands using the CEQ methodology has focused on bigger and more developed islands such as Jamaica (Katayama et al. 2021),

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[1] Before the COVID-19 pandemic, Grenada was making a strong commitment to economic reform and resilience building with the support of international organizations. It achieved an average annual growth of 4.5 percent between 2014 and 2019, surpassing the regional average. Fiscal reforms, including the Fiscal Responsible Act (FRA) of 2015, led to a significant reduction in public debt and the accumulation of a fiscal surplus. Nevertheless, Grenada's economy remains less diversified and highly susceptible to climate change and natural disasters.

[2] MFMOD Database, the World Bank's World Development Indicators (WDI), and GEM databases, IMF. Most sources available in https://data.worldbank.org/.

Barbados (García-Peña Bersh 2019), and the Dominican Republic (Aristy-Escuder et al. 2016). Second, we provide a comparison with similar countries in the Caribbean in order to understand the differences between a small developing island and larger counterparts. Finally, we incorporate into the analysis fiscal interventions that have not been previously analyzed, such as the personal income tax (PIT), which was readjusted in 2019; the most important direct transfer to poor and vulnerable households, the Support for Education, Empowerment and Development Programme (SEED); and school transfers.

The results indicate that Grenada's fiscal system has the potential to decrease poverty rates and inequality in the country, but it shows neutral incidence. Grenada's fiscal policy design is indeed oriented toward the low-income population. Focusing only on inequality and accounting for all fiscal interventions does decrease inequality, as observed in countries like Jamaica and the Dominican Republic. These results point to the redistributive potential of fiscal policies pursued by the government of Grenada. As expected, higher segments of the income distribution pay more taxes than the low-income population, and furthermore, the middle-income population pays more than they receive, as does the population making up the high part of the income distribution. However, overall indirect taxes tend to be neutral, meaning they affect household income proportionally across the income distribution; these taxes do lower inequality, but also increase poverty rates. While direct taxes (PIT) do not have an effect on poverty, they help to reduce inequality in Grenada, indicating a well-targeted structure. In sum, indirect taxes are neutral, and direct taxes are almost progressive.

In the case of direct transfers, their effect on reducing poverty is higher than their impact on inequality. However, SEED reduces headcount poverty by almost three percent, signaling that the policy is well targeted, but it has a low redistributive effect, even though low-income households receive a higher amount, indicating this program is relatively regressive. In-kind transfers show mixed results: government funding of education benefits the poor, with primary and secondary education benefiting low- and middle-income households, while government funding of tertiary education benefits the higher echelons of the income distribution. Health is clearly regressive, providing a greater benefit to poorer households. However, their impact on monetary poverty is challenging to describe due to the need to monetize these services to estimate their effect.

Following this introduction, section 2 provides the context of Grenada's economic performance and poverty and inequality situation, as well as an overview of fiscal revenues and expenditures. The fiscal incidence methodology is described in section 3, while section 4 presents the main results. Section 5 concludes the paper.

2. Grenada's Context: Growth, Poverty, and Fiscal Performance

Grenada's economic growth is heavily affected by external factors, though structural reforms contributed to the country's sustained positive growth between 2014 and 2019 (figure 13, Appendix A1). Thanks to growth-enhancing reforms that expanded tourism and a benign global economic environment, real output growth averaged 4.5 percent annually between 2014 and 2019. The high growth rate led to a dramatic increase in Grenada's per capita GDP. By 2019, Grenada's GDP per capita was only surpassed by those of St. Kitts and Nevis and Antigua and Barbuda (figure 14, Appendix A1). However, the pandemic, compounded by the war in Ukraine, ended the trend of solid growth and led to a sharp economic contraction of 13.8 percent in 2020, followed by a slow recovery in 2021–22. The economic volatility driven by external factors reflects the intrinsic vulnerabilities of Grenada as an SIDS.

In line with the macroeconomic behavior, moderate poverty decreased from 2008 to 2018. However, in the same period extreme poverty increased slightly. As of 2018, Grenada's poverty rate had decreased by almost 13 percentage points compared to 2008 (the previous year for which data were available). In contrast, extreme poverty in Grenada increased by 1.2 percentage points (figure 1, panel a). Regarding inequality, we observe that during this 10-year period, the Gini coefficient, which measures the inequality of the income distribution, increased from 0.37 to 0.40 (figure 1, panel b). This increase in inequality from 2008 to 2018 may imply some degree of deterioration of conditions for the lower part of the consumption distribution, which is also shown in the increase of the extreme poverty rate during this period.

Figure 1 Poverty and Inequality Measures

(a) Poverty and Indigence (%)

(b) Gini Index
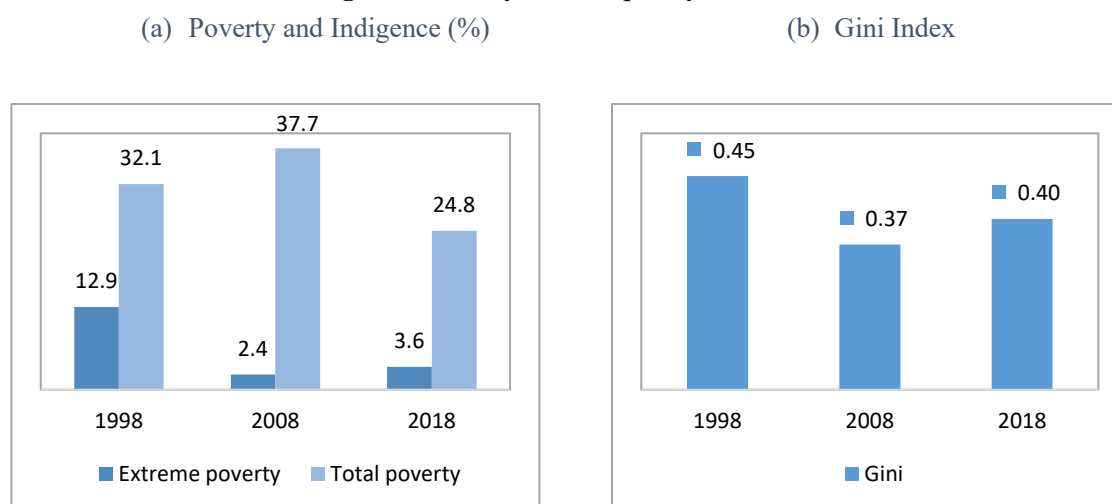
Sources: Government of Grenada, Central Statistical Office, Survey of Living Conditions and Household Budget Survey (SLCHBS) 1998, 2007–08, and 2018–19.

Grenada's fiscal position has varied over the years, partly due to natural and external shocks. Following a modest performance in 2009–13, revenues and grant collection shifted to an upward trajectory in 2014, growing by an average of 11.2 percent annually until 2019. Taxes accounted for 83.2 percent of total government revenue between 2009 and 2021 (figure 2). Tax revenue comprises direct and indirect taxes levied on individuals and businesses. The direct taxes are taxes on income and profits and on property, while taxes on domestic goods and services and on international trade and transactions comprise the indirect taxes. For the purposes of this paper, we focus on the PIT under direct taxes and the value-added tax (VAT) and excise tax under indirect taxes, because these have the most significant impact on individuals and households while also being crucial income earners for the government, as shown in figure 3. PIT in 2021 accounted for 53.4 percent of Taxes on Income and Profits and 10.2 percent of tax revenue. The VAT accounted for 83.8 percent of Taxes on Domestic Goods and Services and 35.0 percent of total tax revenue in 2021. Because the VAT is charged to consumers at the point of purchase, it has implications for individual and household consumption. The excise tax is charged at a fixed rate per quantity of specific goods (imported and locally manufactured goods) referred to as "excisable goods" and accounted for 2.8 percent of tax revenue in 2021.

Figure 2 Revenue and Grants Collection
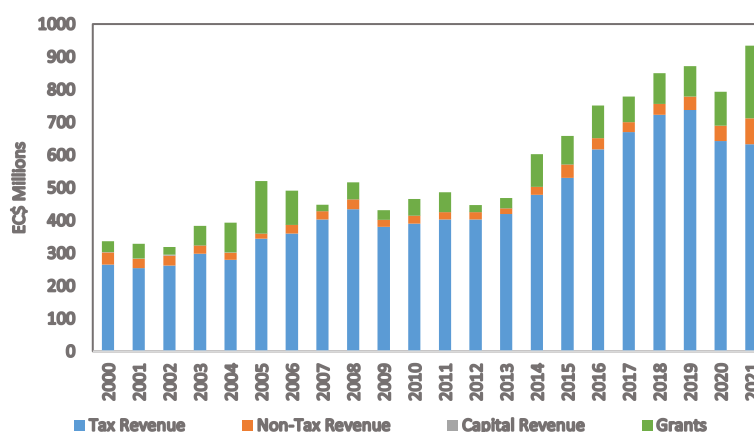
Source: Eastern Caribbean Central Bank Statistics.[3]

Figure 3 Tax Revenue by Tax Type
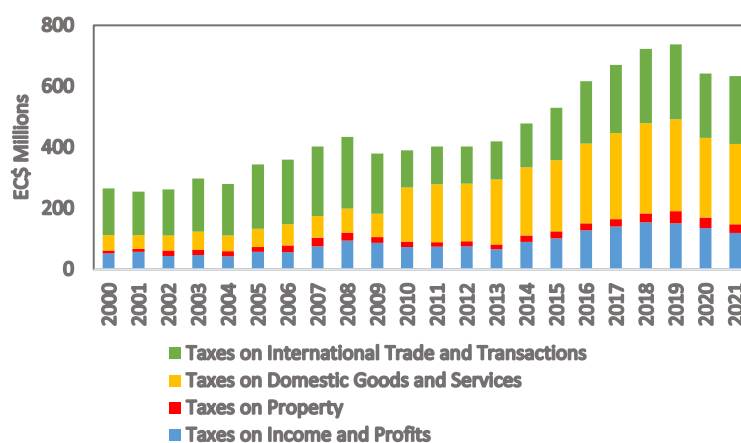
Source: Eastern Caribbean Central Bank Statistics.[4]

Turning to government expenditures, on average, from 2017 to 2021, 32 percent was allocated annually to social programs, including education, health, and public assistance transfers (figure 15, Appendix A2).[5] The most important direct transfer to poor and vulnerable households is done through SEED, which is administered through the Ministry of Social Development. Also important is the School Feeding Programme, which focuses on providing meals to needy students.

Expenditures in education increased over the period 2017–21 and accounted for roughly 10 percent of annual government expenditures (figure 16, Appendix A3). Government recurrent expenditure in public education generally is provided in four stages: pre-primary, primary, secondary, and tertiary (including vocational training). Several institutions also provide special education to serve students with disabilities and special needs. The government largely subsidizes education up to the secondary level (including special education). The level of subsidization decreases at the tertiary level, with higher fees required to access training leading

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[3] Available in https://www.eccb-centralbank.org/statistics.

[4] Available in https://www.eccb-centralbank.org/statistics.

[5] This is based on data retrieved from the Annual National Budget and excludes debt repayments (both principal and interest). In 2022, the Grenada government instituted a cap on gasoline prices, which constituted an energy subsidy. This measure will be analyzed in a future iteration of the tool.

to associate degrees and certifications from the institutions providing this level of schooling. Government expenditure in public education is considered an in-kind transfer because the service can be accessed by all school-age children regardless of socioeconomic background.

Expenditures on health also increased in the period 2017–21, accounting for 7 percent of annual government expenditure as of 2018 (figure 16, Appendix A3). In this paper, funds spent by the government in the health sector amount to in-kind transfers to the public because these services are available to all. Citizens, residents, and visitors can freely access the services in the public health system with no differentiation in fees[6] according to income level or socioeconomic class.

In addition to the in-kind transfers in education and health, the government implemented a social protection system within the SEED program. The program targeted school-age children, people with disabilities, the elderly, the chronically ill, pregnant women, lactating mothers, and the adult poor. Beneficiaries are selected via proxy means testing, which uses household characteristics such as age, household size, marital status, assets, disability, and housing conditions as indicators or "proxies" to determine household expenditure or consumption. Cash is transferred to households: in 2017, it was EC$300 per month or EC$3,600 per annum. In 2018, the amount given to elderly households was increased by EC$100 per month, and in 2022, the government raised the amount paid to all beneficiaries by EC$150 per month. Government annual expenditure on SEED increased from EC$14 million in 2017 to approximately EC$18 million in 2021 and is expected to have increased further in 2022. From 2017 to 2021, the government spent an average of EC$2.9 million per year on the school feeding program.

3. Data Sources

The primary data source is the Survey of Living Conditions and Household Budgets (SLCHBS) conducted by the Central Statistical Office (CSO), the country's national statistics office, between April and May of 2018–19. This survey encompassed a sample of approximately 1,689 households. The primary objective of this questionnaire was to collect information related to household socioeconomic and living conditions as well as the household budget in order to construct the consumption variable (as the survey did not collect income information), data that are crucial for measuring poverty in Grenada. It should be noted that this survey did not gather information regarding pensions received or any social security contributions, neither by individuals nor the government. The survey comprised two distinct parts, one focusing on household conditions and another for obtaining individual characteristics of each household member. The person interviewed was one adult member (older than 18 years old), though the survey collected information on every single household member.[7]

The use of administrative data on taxable wages for the PIT complements the survey information. The source of this data set was the Inland Revenue Division (IRD), a division within Grenada's Ministry of Finance (MOF). This data set covers wages for different workers and is disaggregated into two parts: the estimation of the share of the wage allocated for pension funds, and the other being the gross income, which is the taxable part of the wage received.

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[6] Fees are waived for some services provided to children, the elderly, and the indigent. All fees and co-payments were not included in the analysis given the low amounts reported in the SLCHBS of 2017–18.

[7] To evaluate the accuracy of the data for fiscal interventions, a macroeconomic validation is presented in Appendix B3.

We utilize this administrative database for two years, 2017 with 7,442 observations and for 2018 with 8,146.

Because income information is not available in the survey, we compare the administrative data, specifically the taxable portion, with the consumption estimation. This allows us to obtain a more comprehensive understanding of the income distribution. In some cases, we complement missing survey information with administrative data. Because this data set is disaggregated by gender and occupational category, both with values for the taxable income, the administrative data prove useful. Additionally, the administrative data enable us to compare the income distribution to ensure data consistency and improve the exercise's macroeconomic validation. The result is an accurate set of information that makes constructing the taxable income distribution possible.

4. Methodology

This paper uses the Commitment to Equity (CEQ) methodology to assess the distributional impact of the fiscal system in Grenada. According to Lustig (2018), "The CEQ Assessment is a diagnostic tool that uses fiscal incidence analysis to determine the extent to which fiscal policy reduces inequality and poverty in a particular country" (62). Fiscal redistribution effects refer to the process by which a state collects revenue from individuals and households (through taxation) and allocates this revenue to finance direct transfers, subsidies, and in-kind benefits individuals and households enjoy (Lustig and Higgins 2018). Because this study focuses on the distributional effects on the population, state interventions that affect firms or other private-sector institutions are excluded from the methodology. The CEQ framework aims to answer four main questions: (1) How much income redistribution and poverty reduction is being accomplished through fiscal policy? (2) How equalizing and pro-poor are specific taxes and government spending? (3) How effective are taxes and government spending in reducing inequality and poverty? and (4) What is the impact of fiscal reforms that change a particular tax or benefit's size and/or progressivity? (Lustig 2018).

To calculate the distributional effects of fiscal policy, the CEQ framework constructs different income concepts in sequential stages, starting from pre-fiscal income that includes only private income sources to final income that incorporates the (almost) full set of taxes and government benefits. In summary, the CEQ (Lustig and Higgins 2018) identifies four main concepts of household income (when the household surveys include variables of different sources of income).[8]

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[8] *Market income* includes factor income (all wages and salaries received by workers and capital income), plus private transfers (remittances, private pensions, etc.) plus imputed housing rent, all income before taxes and social security contributions, government transfers and old-age pensions, minus the contribution to social insurance old-age pensions (only in cases where pensions are considered deferred. The contribution to old-age pensions is not subtracted when contributory pensions are financed by the state). *Disposable income* is market income plus direct cash and near-cash transfers, minus personal income taxes and employee social security contributions (only when contributory pensions are treated as transfers). *Consumable income* includes indirect subsidies (energy, food, and other general targeted price subsidies) and excludes indirect taxes (VAT, excise taxes, and other indirect taxes). *Final income* (post-fiscal) is consumable income plus the value of in-kind transfers, such as free or subsidized government services in education and health with copayments and user fees subtracted; it reflects post-fiscal income.

For each income concept, the inequality and poverty indexes are calculated and both magnitudes are compared before and after fiscal interventions. In this regard, the CEQ framework considers variants according to the characteristics of each country, harmonizing the aggregates but not the specific items.

4.1 Income Aggregates Estimation

Grenada's information system has limitations when it comes to applying the detailed CEQ framework. Certain data characteristics are needed to model fiscal incidence within this framework, such as an adequate household income aggregate. While Grenada has conducted the SLCHBS recently,[9] as well as maintaining administrative records of social programs and the characteristics of the tax system, the module of incomes within the SLCHBS is limited. The survey captures income data in brackets, records few details on nonlabor incomes, and does not have information on pension affiliation or amount received by individuals, so it is not possible to construct net market income plus pensions for this exercise in the Granada context. Thus, the NSO opted for building welfare aggregates from household consumption[10] instead of household income. This poses a challenge for the implementation in this paper because we need household incomes to estimate the fiscal incidence and run simulations. Following (Katayama & al.,2021) for the case of Jamaica, in this paper we assume that current consumption equals disposable income.[11] This assumption is the most important for applying the CEQ methodology to Grenada, in that it simplifies the reconstruction of income aggregates by tracing back to market income definition as our measure of base income (before taxes or fiscal interventions). As is known in the estimation of welfare measures in developing countries, the distribution of household consumption tends to be more concentrated than income. Of course, this characteristic could introduce some bias and underestimate the extremes of the distribution; however, there is no other option in the absence of household income data.

Once household consumption is defined and thus consumable income is available, the rest of the income aggregates established in the CEQ methodology are calculated according to the tax structure, social protection, and social delivery in Grenada. Our point of departure is disposable income, which is reported by the survey and is assumed to equal household consumption. Then, to identify the distribution of gross income and, after that recreate the distribution of the market income, it is necessary to work backward, following the steps shown in Figure 4:

Net market income (NMI): This concept (a pretax income) is obtained by adding the amount of personal income tax (*PIT*) to disposable income (*DI*): $NMI = DI + PIT$

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[9] Through the NSO, Grenada implemented SLCHBSs in 2007–08 and 2017–18. The latter (used in this paper) collected information on household characteristics (housing, demographics, education, health status, social protection, and shocks and coping strategies). In addition, this survey focused on household consumption expenditures on food and nonfood items and other transactions such as financial payments, investment acquisitions, fees, and voluntary contributions.

[10] This consumption aggregate is constructed from the following components: (1) expenses and received gifts of food and beverage items, (2) expenses of nonfood articles, (3) value of consumption of durable goods (such as vehicles), and (4) imputed rent of own housing. Household consumption was used as the basis for the official measurement of poverty and inequality in Grenada (World Bank 2021), following the guidelines for measuring welfare aggregates (Deaton and Zaidi 2002).

[11] Other studies that use consumption as primary income are Lara Ibarra et al. (2019) (Arab Republic of Egypt), World Bank (2018), (Kenya), and Majia-Mantilla et al. (2019) (Uganda).

Market income (MI): This aggregate is constructed by subtracting direct transfers (*DTr*, for example, via SEED and the School Feeding Programme) from *MI*: $MI = NMI - DTr$

Consumable and final income, on the other hand, are constructed forward from *DI*.

Consumable income: This is equal to *DI* minus indirect taxes, including VAT and Excise taxes plus indirect subsidies (*IS*): $CI = DI - (\text{VAT} + \text{Excise}) + IS.$[12]

Final income (FI): This aggregate is obtained after including in-kind transfers for inpatient and outpatient care provided by the health system (hospitals and community health centers) (*ikTrH*), as well as care provided by the educational system at the preschool, primary, secondary, university, and special levels (*ikTrE*): $FI = CI + ikTrH + ikTrE.$

Figure 4 CEQ Income Concepts

PRE- FISCAL

MARKET INCOME
Wages, salaries, incomes from

TRANSFERS   TAXES

PLUS Direct

SEED (child, school support and disability

NET MARKET INCOME

MINUS Direct Taxes

Personal income

DISPOSABLE INCOME

PLUS Indirect Transfers

MINUS Indirect Taxes

VAT. Excise Tax

CONSUMABLE INCOME

PLUS Monetized values of main in-

Outpatient and inpatient care, Community health

MINUS Copayments and user fees

FINAL INCOME

Source: Author's adaptation based on CEQ Framework (Lustig 2018).

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[12] This component was considered equal to 0, because the data did not have information to estimate indirect subsidies.

4.2 Assumptions and Implementation of the Fiscal Incidence Analysis

PIT paid by households

We assume that PIT is only paid on the labor income of the employed population in the formal sector. Because we do not have a direct measure of labor income, we use an approximation based on our definition of market income. The following steps were taken to calculate the PIT payment for formal workers using the SLCHBS from 2018: (1) we identify the disposable income; (2) we obtain the net market income, subtracting direct transfers; (3) we divide the resulting value by the number of employed adults; (4) we calculate the taxes paid based on the PIT rates corresponding to the brackets; and (5) we aggregate again at the household level.

VAT paid by households

The VAT is levied on all forms of consumer spending—goods and services. The tax is computed on the value of imports and the value added (or markup) that one business charges another or the final consumer when a good or service is provided. The VAT rate is 15 percent on the selling price; however, hotels and dive operations are charged a rate of 10 percent. Some goods and services, for example flour, rice, sugar, and powdered and evaporated milk are not taxed, nor are postage stamps and supply of textbooks as prescribed by the regulations.

Expenses associated with cell phone services have a tax rate of 20 percent and water and electricity services are partially subsidized, based on consumption bounds. In the case of electricity, the quantities are obtained from the costs paid by the households and the exogenous estimates of the prices per kwH are obtained from the Grenada authorities. Households who consume less than 99 kwH per month are exempt from paying the VAT, while households who exceed this consumption pay the VAT on the excess over the limit. Similarly, the water consumption limit is 2,900 gallons per month, with households paying the VAT on the excess consumption over the stated limit.

Because the VAT is already incorporated in the price, a pretax rate is first calculated for each good using the equation $Pb_j = \frac{Exp}{1+r_{vat}}$ and then the rate is applied to the pretax value.

Although the VAT regulations require companies to have a special registration document showing that they offer taxable products for EC$12,000 per year or operate for at least 12 months, this information is not available in the data source consulted. Therefore, it is difficult to know whether households buy in stores exempt from the VAT registration requirement or sell informally. Likewise, the application of the incidence of indirect taxes does not consider cascading effects, given the difficulty of imputing household deductions to reduce the net payment of these taxes. Consequently, there is an overestimation of the effect of the VAT and excise taxes.

Transfers received by households

Direct transfers in the model are mainly associated with the SEED program and the School Feeding Programme. The SEED transfer is identified in the SLCHBS through a direct question to the households. Based on administrative records, we identify the amounts of program transfers to children, youth, and elderly individuals. Finally, we aggregate the amounts at the household level. The SEED amounts are reduced for households to ensure that base/market

income is never negative so that if the income is less than the transfer, the latter is adjusted to avoid the definition of income being negative.

Estimated value of health care and education services received by households

Using data from the SLCHBS we identify individuals who used public education and health services and imputed values for the use of these services. Based on the utilization of health services by the individuals who responded to the survey, a distinction is made between those who received inpatient care and those who received outpatient care in hospitals and community health centers. We then found data on average unit costs by type of care and imputed it to the individuals who used the service to proxy for the state's current expenditure on health services. As for education, we assume that the public education system serves the entire preschool, primary, secondary, and postsecondary school population. The current expenditure on education was derived from the costs per level of education specified by the Grenada government. Once the annual cost of each level of education was obtained, it was imputed to each student in a household according to the level at which they were enrolled.

Due to the information limitations on household income structure and national accounts in Grenada, we could only perform a basic application with direct effects, omitting considerations on agents' behavior. As more information and parameters on fiscal interventions become available, they could be added to the estimates of fiscal incidence.

5. Main Results

A set of poverty, income distribution, and indicators of progressivity measures were constructed to answer the questions posed above. Next, we present the main results of the simulations.

5.1. How Does the Fiscal System Affect Poverty?

The fiscal system has a high potential for poverty reduction in Grenada (table 1), with the highest impact being associated with in-kind transfers. After adjusting the disposable income, the poverty rate in Grenada for 2018 reached 22.77 percent under the definition of consumption per equivalent adult (equivalent to the definition of disposable income in this document), using the national poverty lines as defined by the CSO (EC$6,782 per year per person, 2017–18). Departing from this measure, the model builds all the other income aggregates as described in the previous section. In the absence of fiscal interventions, such as PIT and cash transfers, 25 percent of the population would live in poverty, with an estimated poverty gap of 8.24 percent. Moreover, after accounting for all taxes and direct transfers, the poverty headcount would be 26.35 percent. In sum, four relevant aspects can be noted. First, the direct transfers (SEED and School Feeding Programme) reduce the incidence of poverty by 2.2 percentage points; these are also reflected in other indicators sensitive to changes in income distribution among the poor, such as poverty severity and the Sen and Watts indexes. Second, the PIT does not change the poverty measures, because it is paid by the population with incomes above the national poverty lines. In fact, based on our estimates, only around 10 percent of the employed population has earnings high enough to be subject to the PIT. Third, indirect taxes such as the VAT (and excise taxes) increase poverty by about 3.6 percent; this is explained by their being structured to be neutral taxes.

Table 1 Poverty Measures According to CEQ-Income Definitions
(In percentage)

Poverty measures	Market income	Net market income	Disposable income	Consumable income
Headcount poverty	25.00	22.77	22.77	26.35
Poverty gap * 100	8.24	6.73	6.73	7.80
Poverty severity * 100	4.10	2.97	2.97	3.45
Watts Index * 100	11.94	9.23	9.23	10.71
Sen Index * 100	11.56	9.06	9.06	10.54

Source: Authors' estimation based on SLCHBS 2018.

Although the net balance of transfers and taxes (direct and indirect) translates into a higher incidence of poverty, the same is not true for the poverty gap (it decreases the poverty gap by about one percentage point) and other poverty measures. All of these show a reduction after the fiscal interventions.

5.2. How Does the Fiscal System Affect Inequality?

The fiscal system in Grenada has heterogeneous redistributive characteristics with a significant potential to reduce inequality. The effects of fiscal interventions on income distribution are heterogeneous, as seen in Table 2. First, the direct transfers (SEED and School Feeding Programme) have low redistributive potential; between the market income and net market income, the Gini index change is below one percentage point. The potential of these transfers is better understood when examining the lower section of the income distribution through the ratio P90/P10, which decreases from 7.4 to 6.8. Second, because the PIT is concentrated in the middle- and upper-income distribution, the effect is noticeable only in the P90/P10 ratio (from 6.8 to 6.6) and on the Gini coefficient, which declines from 0.406 to 0.397. Third, though the VAT and excise taxes seem to be very neutral, they, in fact, cause all inequality measures to decline, although not significantly.

Table 2 Inequality Measurements According to CEQ-Income Definitions

Inequality measures	Market income	Net market income	Disposable income	Consumable income
P90/P10 ratio	7.461	6.856	6.639	6.775
P90/P50 ratio	2.822	2.781	2.701	2.733
P10/P50 ratio	0.378	0.406	0.407	0.403
Gini index	0.416	0.406	0.397	0.395
GE(-1) index	0.300	0.362	0.346	0.340
GE(0) index	0.304	0.279	0.267	0.264
GE(1) index	0.302	0.288	0.272	0.270
GE(2) index	0.411	0.393	0.364	0.360
Atkinson (0.5) index	0.140	0.132	0.126	0.125
Atkinson (1) index	0.262	0.244	0.234	0.232
Atkinson (2) index	1.000	0.420	0.409	0.405

Source: Own calculation based on SLCHBS 2018.

5.3. Who Pays the Taxes and Who Receives the Transfers?

Given the current PIT structure, the taxpayers are highly concentrated in the top deciles, while individuals across the income distribution pay the VAT. According to the current PIT structure, this tax is aimed at those earning EC$30,000 or more. Given the distribution of disposable income (approximated by consumption), the size and incidence of the tax affect only the 8th, 9th, and 10th deciles (figure 5). Of course, because household income is not measured directly in the survey, it is considered a rough estimate and should be interpreted with caution. In comparison, due to the VAT's characteristics, the amount of tax paid is directly proportional to total consumption, so that tax collection increases as wealth increases. However, small differences across deciles are present because of the consumption structure, the existence of tax exemptions and goods with special tax rates, and perhaps some tax evasion.

Figure 5 Average Amount Paid in Direct and Indirect Tax by Deciles of Market Income (in EC$)
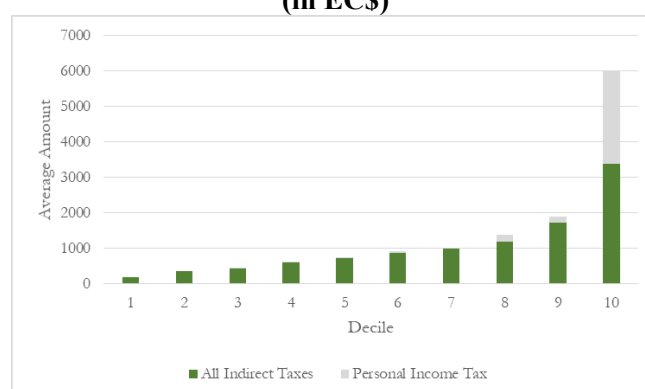
Source: Own calculation based on SLCHBS 2018.

The main effects of the social protection programs are highly concentrated in the lower part of the income distribution, especially in the first two deciles. As described previously, Grenada has two main interventions in its social protection system, the SEED and the School Feeding Programme (described above). While SEED, which includes several subprograms, generates transfers to households across all deciles, it has a greater impact on low-income households below (figure 6).

**Figure 6 Direct Transfers Incidence by Market Income Decile (in EC$)**
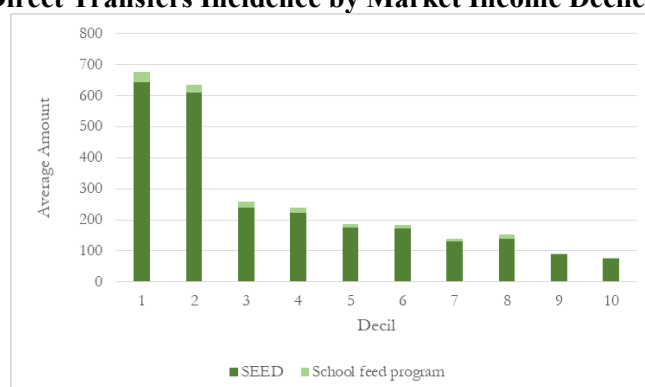
Source: Own calculation based on SLCHBS 2018.

The net effect of the direct fiscal policies is positive for the poor. When the population is ordered according to net market income, it is observed that what the first two deciles receive

as transfers exceeds what they pay in direct and indirect taxes, while the third decile of the population and above are net payers. This demonstrates that Grenada's fiscal policy design is focused on the low-income population. While the middle of the income distribution pays more than they receive, the net effect is important in the top deciles (especially in the 10th decile) (figure 7). It is usual for taxes such as the VAT or other general sales taxes to be neutral or to affect household disposable income proportionally across the income distribution. In addition, by having the PIT targeted at those earning middle and high incomes, Grenada's tax system has taxpayers from the population across all income distribution groups.

Figure 7 Net Payers (Direct Transfers and Direct and Indirect Taxes) by Decile of Market Income

(a) in EC$ per year	(b) As a percentage of market income (change scale to %)
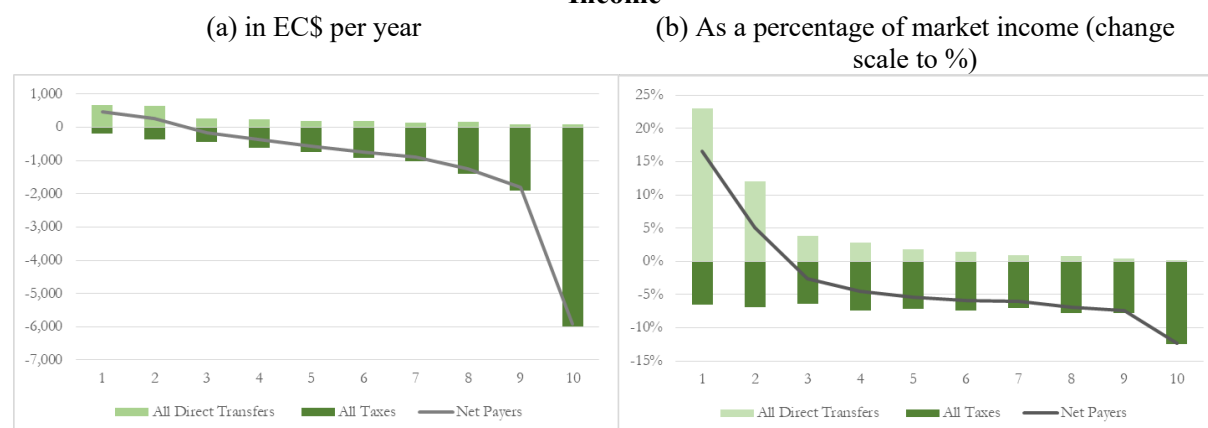
Source: Own calculation based on SLCHBS 2018.

In-kind transfers, especially those related to education, greatly benefit the poor. Based on the 2018 SLCHBS, primary and secondary attendance is almost universal, so the tax incidence is even higher in the low- and middle-income population. However, the structure by level is different across the income distribution: while in the lower strata primary education has a greater weight, in the middle and upper strata the incidence of postsecondary education is higher (figure 9). Furthermore, despite the high enrollment rates, there is also a high educational lag. The value of schooling, as a fraction of net market income, has a high share for households in the lower part of the income distribution, especially in those with children in preschool, primary, and secondary school, while it is less relevant for the upper deciles. As a fraction of net market income, the value of health care transfers is relevant for households in the lower part of the distribution, especially care provided by community health centers, while the value decreases in the upper deciles (figure 8). In summary, in-kind transfers received by households, including education and health services, are similar in levels (per equivalent adult) across the different income levels. When expressed as a fraction of net market income, both are relevant for the population located at the lower end of the income distribution; they decrease in relevance the more economic capacity households have (figure 8).

Figure 8 Transfers in Health Care Received by Households by Market Income Decile

(a) in EC$ per year   (b) As percentage of market income
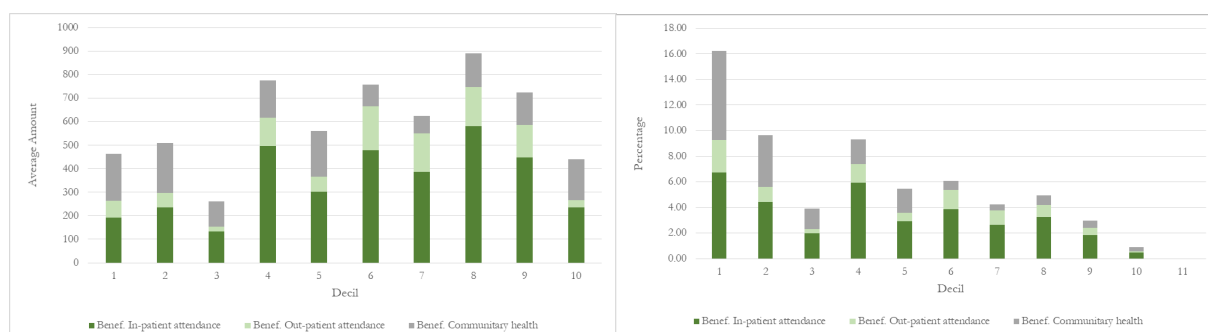
Source: Own calculation based on SLCHBS 2018.

Figure 9 School Attendance and Transfers Received by Households by Market Income Decile

(a) in EC$ per year   (b) As percentage of market income
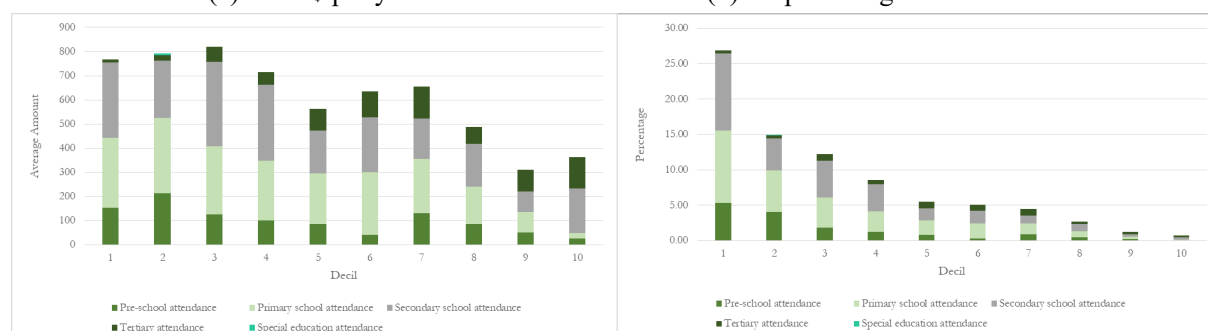
Source: Own calculation based on SLCHBS 2018.

Figure 10 In-kind (Health and Education) Transfers Received by Households by Market Income Decile

(a) in EC$ per year   (b) As percentage of market income (change to %)
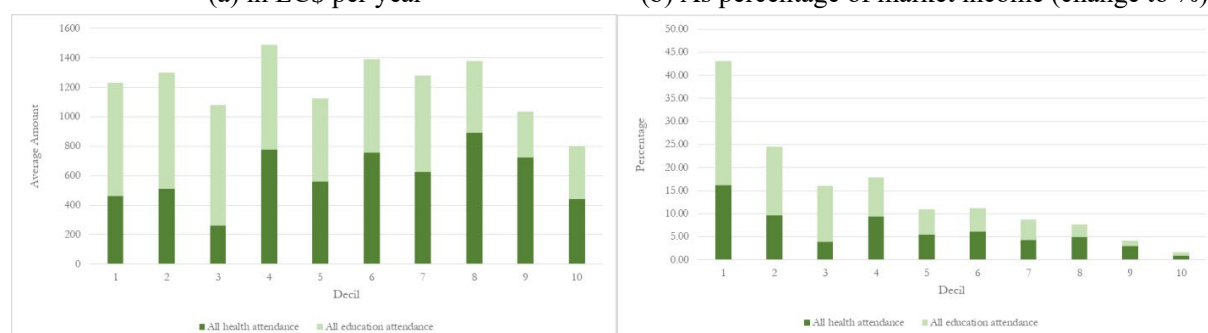
Source: Own calculation based on SLCHBS 2018.

5.4. How Progressive Are the Fiscal Interventions?

Concentration indexes were calculated for each direct transfer, direct and indirect taxes, and in-kind transfer to examine the distributive characteristics of fiscal interventions. A concentration index (CI) summarizes the relationship between initial income and the intervention analyzed. In the case of a tax, a concentration index with a positive sign (CI > 0) and high value indicates households with higher incomes pay more; if it tends to 0, then the tax is not related to the level of income. On the other hand, when direct transfers are analyzed, if they have a negative concentration index (CI < 0), this indicates that the lower the income,

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the higher the amount of transfers received; if it is 0, it indicates that the transfer is universal and the level of prefiscal income does not matter.

Direct taxes and direct transfers present high levels of concentration. The concentration indexes provide some interesting insights about Grenada's fiscal system (figure 11). First, the SEED program and School Feeding Programme mainly target low-income people; this is observed through the negative sign of the concentration coefficient and indicates a negative relationship between income and transfer. Second, the PIT concentration index is very high and positive, which shows that this tax impacts high incomes. Third, as noted above, indirect taxes show a positive concentration index, although significantly lower than in the case of the PIT. Thus, this tax is paid by the entire population, but those at the top of the distribution pay proportionally more relative to their income. Finally, health transfers are almost neutral, even though the middle- and high-income population uses the services. However, health services in community centers show a negative concentration index, indicating that these are preferentially used by the population in the lower part of the distribution (on both an inpatient and an outpatient basis) as opposed to hospital care. Regarding education services, it should be noted that, except for tertiary education, all levels serve mainly the low- and middle-income population. At the same time, tertiary education is available mainly to the high-income population, with education as a whole being progressive.

Figure 11 Concentration Index by Fiscal Intervention
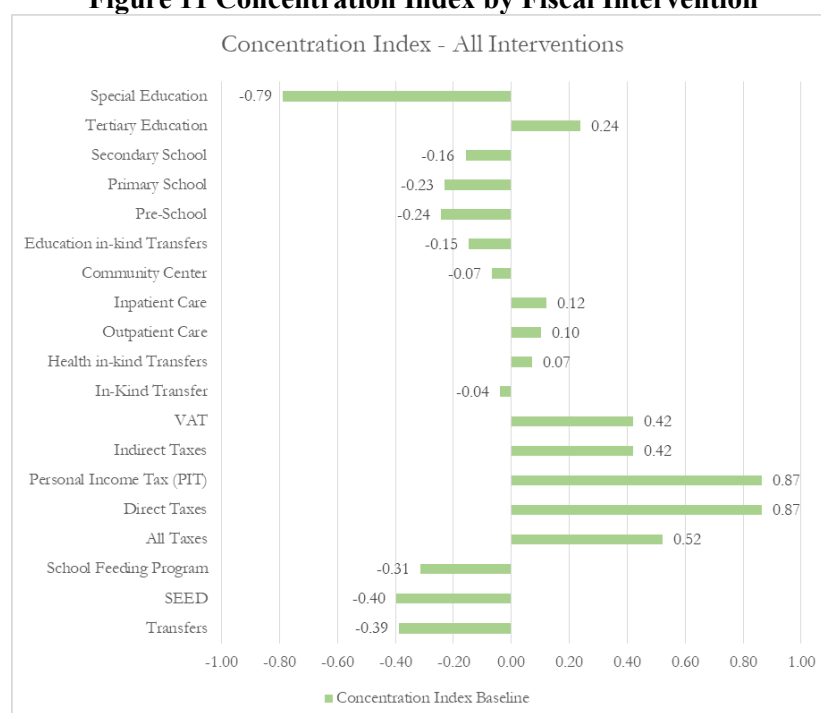
Source: Own calculation based on SLCHBS 2018.

Grenada has developed a fiscal policy with distributively neutral characteristics and a modest potential to reduce monetary poverty. Disposable income, which incorporates transfers and subtracts direct taxes, is virtually unchanged from market income and the change in inequality is imperceptible. On the other hand, consumable income, which considers the payment of indirect taxes (VAT and excise taxes), represents 92.7 percent of market income. Although this difference is significant, its contribution to changes in inequality is not very noticeable. When in-kind transfers are added, final or post fiscal income is 0.7 percent higher than market income, with a modest potential for inequality reduction.

5.5. How Progressive or Regressive Are Interventions and Overall Fiscal Policy?

Grenada has managed to establish a tax system with progressive direct taxes, neutral indirect taxes, and globally progressive transfers that is redistributive but that has substantial space to increase efficiency in the reduction of inequalities. Calculation of the concentration indexes of fiscal interventions in Grenada and obtaining the revenue concepts yielded the following results, which are presented in table 3. All taxes have a concentration index of 0.522, higher than the Gini index of market income, and a Kakwani index that is positive but close to 0, which defines this intervention as globally progressive. This result is stronger in the PIT case, while the VAT behaves more like a proportional tax. Similarly, when the transfers are analyzed, they show a negative concentration index and a positive Kakwani measure, so that they can be considered globally progressive in absolute terms. Both transfers have this characteristic in such a way that the benefits (per equivalent adult) decrease when (prefiscal) market income increases.

Table 3 Concentration Index and Progressivity of Fiscal Intervention

	Size (wrt Market income)	Gini index	Concentration index	Kakwani index	Inequality reduction effect
MARKET INCOME	1	0.416			
DISPOSABLE INCOME	0.998	0.397			
- SEED	0.016		-0.396	0.812	0.013
- School Feeding Programme	0.001		-0.312	0.729	0.001
All direct transfers	0.017		-0.387	0.803	0.014
- PIT	0.019		0.865	0.449	0.009
CONSUMABLE INCOME	0.927	0.395			
- VAT	0.070		0.422	0.006	0.000
- Excise Tax					0.000
All indirect Taxes	0.070		0.422	0.006	0.000
All taxes	0.089		0.522	0.106	0.010
FINAL INCOME	1.007	0.367			
- Benef. Inpatient attendance	0.024		0.121	-0.295	-0.007
- Benef. Outpatient attendance	0.007		0.104	-0.312	-0.002
- Benef. Community health	0.010		-0.066	-0.482	-0.005
All health attendance	0.040		0.072	-0.344	-0.014
- Preschool attendance	0.006		-0.241	-0.657	-0.004
- Primary school attendance	0.013		-0.230	-0.647	-0.009
- Secondary school attendance	0.015		-0.157	-0.573	-0.009
- Tertiary attendance	0.005		0.240	-0.177	-0.001
- Special education attendance	0.000		-0.788	-1.204	0.000
All education attendance	0.039		-0.147	-0.563	-0.023
All in-kind transfers	0.079		-0.039	-0.455	-0.039

Source: Own calculation based on SLCHBS 2018.

5.6. What Is the Marginal Contribution to the Redistributive Effect of Fiscal Interventions?

Other than in the area of tertiary education, Grenada's fiscal policies contribute to the reduction of inequality. In this part of the paper, we use the definitions of the marginal contribution to the redistributive effect of fiscal interventions, mainly those contributions with respect to the relative size of specific items as well as vertical equity, included in the concepts presented in the CEQ framework. Both help with showing which interventions (or groupings of them) are effective in reducing inequality through fiscal policy. This exercise shows that, with the exception of tertiary education, the rest contribute to the reduction of inequalities. When

looking at vertical equity, direct transfers are more effective in reducing inequality than direct taxes, which, as we noted above, are mainly targeted at middle- and high-income earners.

Figure 12 Marginal Contribution to Redistributive Effect by Fiscal Intervention

(a) With respect to the relative size of a specific item

(b) Marginal contribution to vertical equity
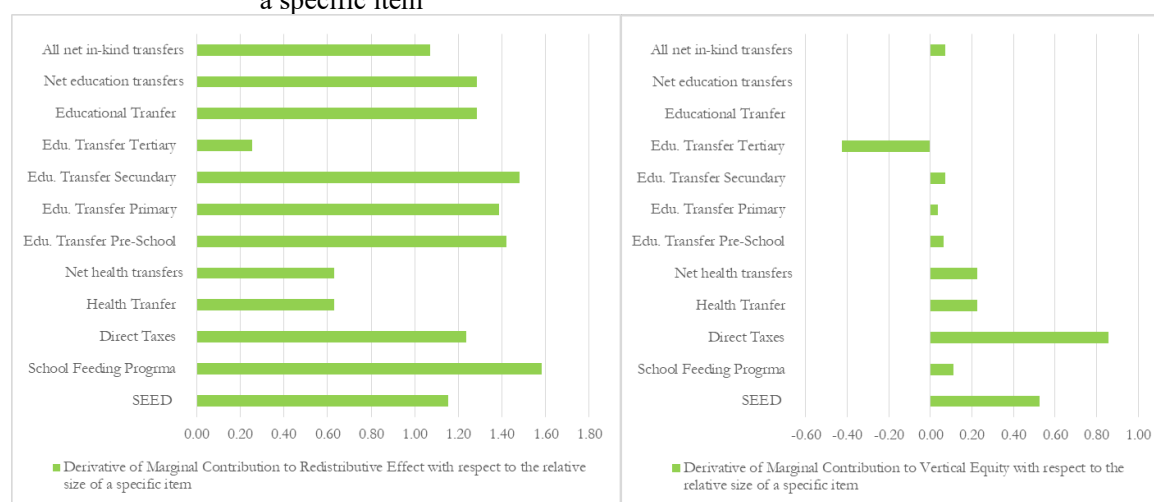
Source: Own calculation based on SLCHBS 2018.

6. Conclusions

This paper analyzes the distributional incidence of recent fiscal policy in Grenada using the framework of the Tulane University CEQ methodology. Based on the 2017–18 Survey of Living Conditions and Household Budgets (SLCHBS), we estimate the household consumption aggregate (which includes food, nonfood, durable goods consumption, and imputed housing rent). Assuming that this aggregate represents disposable income, we constructed the concepts of pre and postfiscal income required for the distributional incidence analysis.

Our results help to determine who bears the burden of taxation and who benefits from direct and indirect transfers in the Grenada fiscal system. One of the main limitations of this study is that no conclusions can be drawn regarding Grenada's pension system, because the relevant data are not captured by the SLCHBS. When the population is ordered according to net market income, it is observed that the first two deciles receive transfers of amounts that are greater than what they pay in direct and indirect taxes, while the deciles from the third upward are net payers. Accordingly, Grenada's fiscal policy design is indeed focused on the low-income population. While the middle of the income distribution pays more than they receive, the net effect is significant in the top deciles (especially in the 10th). It is usual for taxes such as a VAT or other general sales taxes to be neutral or to affect household disposable income proportionally across the income distribution.

According to the estimates, Grenada's fiscal system does have potential to reduce poverty further. The headcount poverty index in Grenada decreases by about 2.2 percentage points (from 25 to 22.77 percent) from market income due to the effects of direct transfers and direct taxes, while this reduction is reversed when indirect taxes (VAT and excise tax) are included. However, we must consider the overestimation of the VAT payment due to cascading effects, because neither deductions nor evasion associated with purchases in the informal sector were incorporated in the model.

Analyzing the Gini index, this changes by 4.9 percentage points between net market income and postfiscal income, which includes all the interventions analyzed. However, the changes attributed to direct transfers and direct and indirect taxes account for about 2 percentage points, while the remainder is attributed to in-kind transfers associated with education and health services. This demonstrates that the fiscal policy elaborated by the government does have a redistributive effect that decreases inequality.

To deepen our analysis, we calculated the concentration indexes of transfers and taxes in order to determine the progressivity of the interventions. The results are summarized as follows: (1) both the SEED program and the School Feeding Programme mainly target low-income people, which is observed through the negative sign of the concentration coefficient, indicating a negative relationship between income and transfer; (2) the PIT concentration index is very high and positive, which shows that this tax impacts high incomes; (3) as noted above, indirect taxes are associated with a positive concentration index, although significantly lower than in the previous case; and (4) health transfers are almost neutral, even though the middle- and high-income population uses the services. However, health services in community centers show a negative concentration index, indicating that these are preferentially used by the population (on both an inpatient and outpatient basis) in the lower part of the income distribution, as opposed to hospital care.

Regarding education services, it should be noted that, except for tertiary education, all levels serve mainly the low- and middle-income population. Tertiary education is available mainly to the high-income population, though education as a whole is progressive.

Regarding changes in inequality attributed to fiscal interventions, Grenada presents results in line with what is expected in comparable countries (mainly Central American countries and Jamaica; see table 8 in Appendix E). In Grenada, the Gini index is more sensitive than in Jamaica but less sensitive than in Costa Rica. These results point to the redistributive potential of the fiscal policies pursued by the Government of Grenada.

This analysis has aimed to obtain as complete a picture as possible of the redistributive effect of taxes and expenditures in Grenada. With the support of the World Bank Group, the International Monetary Fund, and other international organizations, Grenada is developing economic reforms to promote growth and support economic activities, especially in the wake of the COVID-19 pandemic, which impacted the economy and the health situation of the population quite negatively.
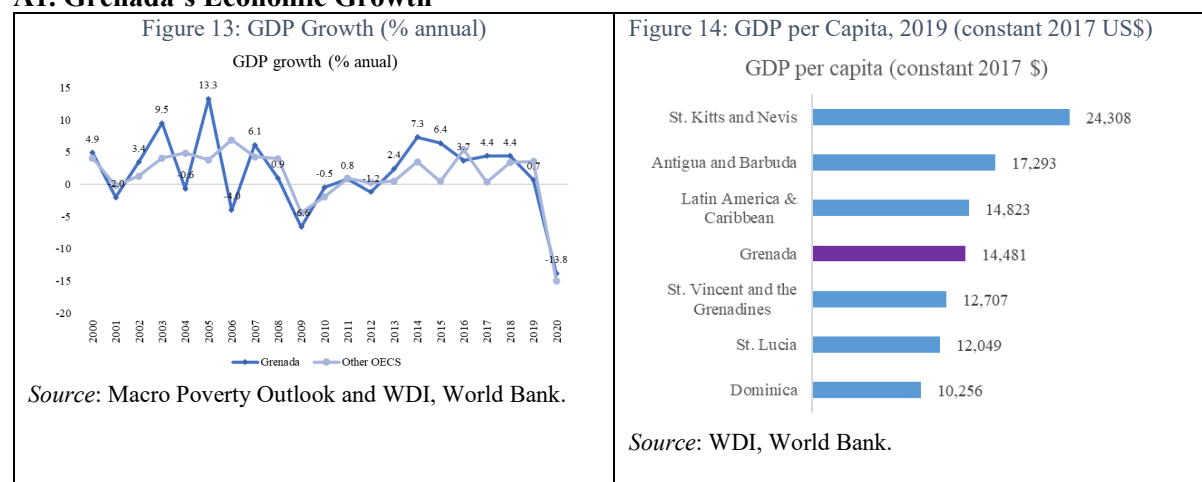
References

Aristy-Escuder, J., Cabrera, M., Blanco Moreno, D., & Sanchez-Marin, M. (2016). Fiscal Policy and Redistribution in the Dominican Republic. In G. Inchauste, & N. Lustig, *The Distributional Impact of Fiscal Policy: Experience from Developing Countries.* CEQ Institute, Tulane University, and the World Bank.

Deaton, A., & Zaidi, S. (2002). *Guidelines for Constructing Consumption Aggregates for Welfare Analysis.* World Bank. Washington, DC: World Bank.

García-Peña Bersh, N. (2019). "A Gendered Fiscal Incidence Analysis for Barbados". Master's thesis, Universidad de San Andrés.

Greenspun , S., & Lustig, N. (2013). Gendered Fiscal Incidence Analysis. A Review of the Literature. *Commitment to Equity (CEQ) Working Paper Series*.

Grenada, Ministry of Education and the Grenada Food and Nutrition Council in collaboration with PAHO and CARPHA. (2015, December). National School Nutrition Policy for Grenada. St George's, Grenada.

Grenada, Ministry of Finance. (2009). *Proposal for a Value-Added Tax.* St George's: Government of Grenada.

Grenada, Ministry of Foreign Affairs. (2022). *Voluntary National Review Grenada 2022: A National Vision Aligned to the SDGs.*

Grenada, Ministry of Social Development. (n.d.). *Community Programmes - Support for Education, Empowerment and Development (SEED).* Retrieved from Government of Grenada Website: https://gov.gd/sites/mos/files/docs/Documents/SEED%20BROCHURE%20updated.pdf

Heger, M., Julca, A., & Paddison, O. (2008). Analysing the Impact of Natural Hazards in Small Economies: The Caribbean Case. *WIDER Research Paper*.

Herbert, S. (2019). Development Characteristics of Small Island Developing States. *K4D Helpdesk Report. Institute of Development Studies.*

Horscroft, V. (2014). *Public Sectors in the Pacific Islands: Are They 'Too Big' and Do They 'Crowd Out' the Private Sector?* Washington, DC: World Bank.

IMF. (2016). *Grenada: Fifth Review Under the Extended Credit Facility, Request for Modification of Performance Criteria, and Financing Assurances Review-Press Release; and Staff Report.* Washington, DC: International Monetary Fund (IMF).

IMF. (2019). *Grenada: 2019 Article IV Consultation: Press Release; Staff Report; and Statement by the Executive Director for Grenada.* International Monetary Fund. IMF Country Report.

IMF. (2022). *Grenada 2022 Article IV Consultation - Press Release; Staff Report; and Statement by the Executive Director for Grenada.* Washington, DC: International Montery Fund (IMF).

Katayama, R., & al., e. (2021). *The Distributional Impact of the Fiscal System in Jamaica.* World Bank Group, World Bank, Poverty and Equity Practice Mimeograph. Washington, DC: World Bank.

Lara Ibarra, G., Sinha, N., Fayez, R., & Jellena, J. (2019). *Impact of Fiscal Policy on Inequality and Poverty in the Arab Republic of Egypt.* Washington, DC: World Bank.

Legarda, B. (1984). Small Island Economies. *Finance and Development, 21*(2), 42.

Lustig, N. (2016). Fiscal Policy, Inequality and the Poor in the Developing World. *Center for Global Development Working Paper*.

Lustig, N. (2018). *Commitment to Equity Handbook: Estimating the Impact of Fiscal Policy on Inequality and Poverty.* Washington, DC: Brookings Institution Press.

Lustig, N. (2020). Measuring the Distributional Impact of Taxation and Public Spending: The Practice of Fiscal Incidence Analysis. In *Oxford Research Encyclopedia of Economics and Finance*.

Lustig, N., & Higgins, S. (2018). The CEQ Assessment: Measuring the Impact of Fiscal Policy on Inequality and Poverty. In N. Lustig, *Commitment to Equity Handbook: Estimating the Impact of Fiscal Policy on Inequality and Poverty* (pp. 3–55). Tulane University.

Lustig, N., Pessino, C., & Scott, J. (2014). The Impact of Taxes and Social Spending on Inequality and Poverty in Argentina, Bolivia, Brazil, Mexico, Peru, and Uruguay. *Public Finance Review, 42*(3), 287-303.

Majia-Mantilla, C., Fajardo-Gonzales, J., Goldman, M., Jellena, J., & Renda, H. (2019). *Fiscal Incidence Analysis Using the UNHS 2016/17*. Washington, DC: World Bank.

McElroy, J. L. (2006). Small Island Tourist Economies across the Life Cycle. *Asia Pacific Viewpoint, 47*(1), 61-77.

OECD. (2018). *Making Development Co-operation Work for Small Island Developing States*. Paris: OECD Publishing.

OECD; IBRD/World Bank. (2016). *Climate and Disaster Resilience Financing in Small Island Developing States*.

UN Economic Commission for Latin America and the Caribbean. (1999). *Tax Performance and Reform in the Organisation of Eastern Caribbean States*. Port of Spain: UN ECLAC.

World Bank - LAC Social Protection and Jobs Global Practice. (2019). *Grenada Safety Net Advancement Project - Implementation Completion and Results Report*. Washington, DC: World Bank.

World Bank. (2017). Small States: A Roadmap for World Bank Group Engagement.

World Bank. (2018). *Fiscal Incidence Analysis for Kenya: Using Kenya Integrated Household Budget Survey 2015-16*. Washington, DC: World Bank.

World Bank. (2021). *Living Conditions in Grenada: Poverty and Equity Update*. Washington, DC: World Bank.

Younger, S., Osei-Assibey, E., & Oppong, F. (2017). Fiscal Incidence in Ghana. *Review of Development Economics, 21*(4), e47-e66.

APPENDIX A: GRENADA'S CONTEXT: GROWTH AND EXPENDITURE

A1. Grenada's Economic Growth

Figure 13: GDP Growth (% annual)	Figure 14: GDP per Capita, 2019 (constant 2017 US$)

GDP growth (% anual)

Source: Macro Poverty Outlook and WDI, World Bank.

GDP per capita (constant 2017 $)

St. Kitts and Nevis	24,308
Antigua and Barbuda	17,293
Latin America & Caribbean	14,823
Grenada	14,481
St. Vincent and the Grenadines	12,707
St. Lucia	12,049
Dominica	10,256

Source: WDI, World Bank.

A2: Grenada's Government Expenditure

Figure 15 Expenditure by Type

- Wages, Salaries & Allowances
- Goods and Services
- Interest Payments
- Transfers & Subsidies
- Capital Expenditure

Source: Eastern Caribbean Central Bank Statistics (https://www.eccb-centralbank.org/statistics)
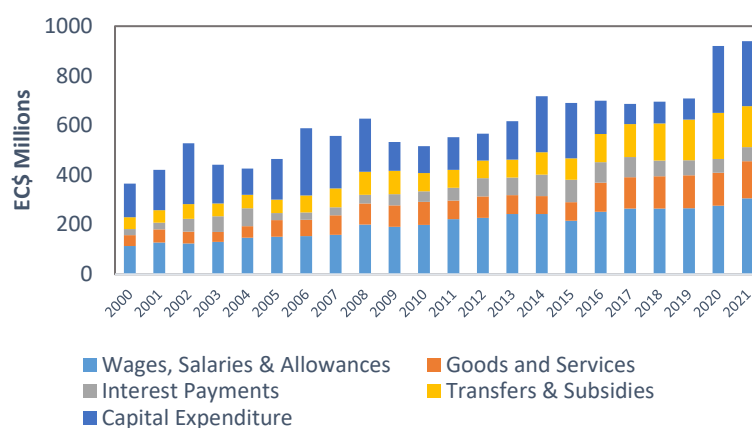
A3: Grenada's Health and Education Expenditures

Figure 16 Health and Education Budgeted Expenditures

	2017	2018	2019	2020	2021
Education	104.0	112.1	118.1	120.8	124.0
Health	79.9	82.3	87.9	89.7	94.9

Source: Estimates of Revenue and Expenditure (Grenada National Budget).
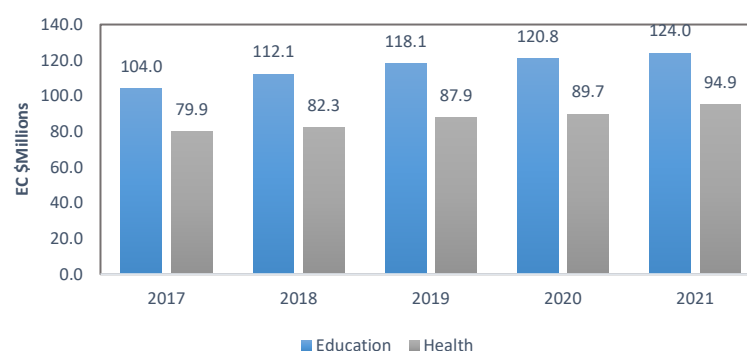
APPENDIX B: MACROECONOMIC AND FISCAL DATA

Table 4 Central Government Fiscal Balance, 2014–18 (in EC$, millions)

	2014	2015	2016	2017	2018
Total revenue	602.8	658.5	751.6	778.2	849.1
Revenue	502.3	571.3	651.6	700.1	754.8
Tax revenue	448.1	511.8	600.5	651.9	703
- Tax on income and profits	89.9	101.7	127.3	140.6	153.9
- Taxes on property	21.3	23.3	23.9	24.3	29.2
- Taxes on goods and services	193.4	214	244.8	263.7	276.4
- Taxes on international trade	143.5	172.8	204.5	223.3	243.4
Nontax revenue	54.2	59.5	51.1	48.2	51.8
Citizenship by investment program	0.3	16.3	3,4	4,9	3,3
Fees, fine, and sales	19	18,5	23.1	22.8	25.4
Licences and other	30.0	18.4	16.6	18.2	23.1
Grants	100.5	87.2	100	78.1	94.3
Total expenditure and net lending 1/	717.6	690.6	685.6	686.6	695.3
Current expenditure	490.9	467	565.5	605.9	608.5
Wages and salaries	242.4	215.3	240.4	246.9	251.6
NIS contributions	11.4	10.6	11.2	18.4	12.7
Goods and services	72.2	75.9	117.6	126.5	130.7
Transfers	77.7	75.3	113.9	133.2	150.3
Transfers abroad (Contributions)	13.1	13.8	14.3	20.8	19.6
Grants and subventions (other private sector)	24.2	23.7	41.4	48.1	56.5
Public assistance	0	0	16.9	20.6	21.5
Pensions	40.3	37.8	41.4	43.7	52.6
Interest payments	87.2	89.9	82.3	81	63.2
Capital expenditure and net lending w/o natural disaster	226.7	223.6	120.1	80.6	86.8
Grant financed	90.6	87.2	74	64.2	74.9
Nongrant financed	136.1	136.5	46.1	16.4	11.9
Primary balance 2/	-27.6	57.8	148.3	172.6	217
Overall balance	-114.8	-32.2	66	91.6	153.8
Public debt	2504.5	2425.4	2338.1	2130.9	2030.8
Memo items:					
Nominal GDP (EC$, millions)	2461	2692	2866	3043	3202

Source: IMF (2016).

Table 5 Estimate of Value Added Tax (VAT) (in EC$, millions)

	2018	2019	Est. Outturn 2020	Est. Outturn 2021
Total revenue and grants	**849.1**	**871.9**	**792.7**	**886.3**
Tax revenue	703	718.7	**622.8**	**596.4**
Taxes on income and profits	153.9	151.4	**135.0**	**114.0**
Personal Income Tax (PIT)			65.9	58.0
Corporate Income Tax			58.3	45.1
Withholding Tax			10.8	10.9
Taxes on property	29.2	39.7	**34.8**	**29.4**
Taxes on domestic goods and services	276.4	282.2	**128.2**	**120.6**
Value Added Tax (VAT)			103.7	98.5
Excise Tax			2.7	2.7
Stamp Duty			2.5	1.8
Annual Stamp Tax			18.9	16.9
Embarkation Tax			0.1	0.1
Gaming Tax			0.4	0.5
Taxes on international transactions	243.4	245.4	**324.8**	**332.3**
Import Duty			73.7	75.3
Consumption Tax; Imported G & S			-	-
Petrol Tax			55.4	58.2
Customs Services Charge			50.9	54.1
Environmental Levy			10.2	10.1
Miscellaneous Customs Revenue			1.3	1.7
Value Added Tax (VAT)			113.2	114.7
Excise Tax			19.9	18.3
Memo ítem				
VAT domestic + imports			**216.9**	**213.3**

Source: An elaboration based on World Bank preliminary tables.

B2. Macroeconomic Validation

Table 6 Current and Captured Revenue/Expenses

REVENUE/EXPENSES IN EC$, MILLIONS		
	Current	**Captured by the model**
TRANSFERS	21.1	20.78
VAT	249.8	86.35
PIT	36.6	23.86
IN-KIND TRANSFERS	121.9	97.90

APPENDIX C: CONSTRUCTION OF CONSUMPTION AGGREGATE

From the SLCHBS, this aggregate includes the following items:

(a) Purchases of food consumption (F). Survey respondents are asked whether they consume each product on a list, the quantities purchased in the past seven days and the corresponding expenditure (bakery, cereals, beef and meats, fish, milk, vegetables, fruits, meals and snacks, nonalcoholic and alcoholic beverages and food and drinks consumed out of home). All expenditures were annualized. Food received as a gift in the last four weeks was imputed with the information on the average expenditure per unit observed for the purchases.

(b) Nonfood expenditures (N). These include expenses related to housing, utilities, services, furniture and furnishing, electronic products and equipment, clothing and shoes, transport and other expenses in education, and health care and others. Because expenses have different reference periods, this component was also annualized.

(c) Estimated consumption of vehicles (V). To obtain the consumption value of vehicles, the difference between the purchase price (MPr) and the residual price (RPr) was estimated, divided by the years of age of vehicle (Age) and weighted by the fraction of household use (f): $V = \frac{MPr - RPr}{Age} * f$

(d) Imputed rent of own-occupied housing (R). According to the recommendations for the construction of the consumption aggregate (Deaton and Zaidi, 2002), this part is relevant due to the flow of welfare received by homeowners living in their own homes. The survey captures the self-report of the rent that the owner would pay (R). However, because this amount is overestimated, we obtain estimates based on observations of rents actually paid (although the number of observations of rented housing was relatively small). In this project, this value was estimated through the following steps: (1) a distribution of paid rents was obtained and ordered in a variable (Y) using 20 brackets; (2) a Poisson model of self-reported rents (R) was estimated, conditional on housing characteristics, including the geographic location: $E(R|X) = \exp(XB)$; (3) the prediction of these values was also ordered in 20 percentiles; (4) the values of the observed distribution were matched to the ordering of own housing; and (5) we obtained the net imputed rent by subtracting the homeowners' expenses for home repairs (labor). Because of this, the expenses of construction and labor are not taxed. This concept is closer to the welfare flow that households receive for occupying their own home. In the case of households who pay rental house, this amount is part of nonfood expenditures.

The consumption aggregate (C) is thus equal to food purchases and gifts (F), nonfood purchases (N), household vehicle consumption (V), and imputed rent of own housing (R): $C = F + N + V + R$. Of these items, only food and nonfood items are subject to the VAT or excise taxes. According to the methodology, this aggregate is expressed by adult equivalent (instead per capita) and used for the estimation of official poverty and inequality statistics in the country. The adult equivalence scales are determined following those used in the 2007–08 poverty estimation by the World Bank and adopted by the Government of Grenada.

Table 7 Adult Equivalence Scales (ae)

Age range	Male	Female
Less than one	0.27	0.27
1 to 3	0.47	0.44
4 to 6	0.61	0.55
7 to 9	0.70	0.61
10 to 14	0.83	0.70
15 to 18	0.92	0.74
19 to 29	1.00	0.74
30 to 60	0.97	0.73
61+	0.77	0.62

Source: CDB – Country Poverty Assessment Survey: Grenada Carricou, Martinique 2007/2008.

Finally, instead of using this aggregate in per capita terms, it is calculated considering the sum of equivalent adults: $C(ae)_h = \frac{C_h}{\sum_{i=1}^{m|h} ae_{i|h}}$.

APPENDIX D: INDICATORS FOR MEASURING FISCAL INCIDENCE THROUGH THE CEQ FRAMEWORK.

Following Lustig (2020), in order to estimate the impact of the Grenada's fiscal policies on poverty and inequality this paper analyzes some key indicators to answer the main research questions. These indicators are those commonly used to assess poverty, inequality, and progressiveness.

Poverty Indicators

The CEQ framework for examining the impact of taxes or transfers on poverty uses the standard poverty measures. Accordingly, this study uses the headcount ratio, the poverty gap ratio, and the squared poverty gap. The study's novelty lies in the estimation of indicators for every income concept that the CEQ framework takes into account. Analytically we have that headcount poverty can be estimated by $P_0^x = \frac{\sum_i^N 1(y_i^x < z)}{N}$; the poverty gap can be estimated by $P_1^x = \frac{1}{N}\sum_{i=1}^N 1(y_i^x < z)\frac{(z-y_i^x)}{z}$ and the squared poverty gap (poverty severity) can be estimated using $P_2^x = \frac{1}{N}\sum_{i=1}^N 1(y_i^x < z)\left(\frac{z-y_i^x}{z}\right)^2$, where z is the poverty line and y_i is income, the subindex ith represents the ith household and the superindex is the x income concept,[13] and N is the total population of Grenada. Thus $z - y_i$ corresponds to the *gap* between the poverty line and the income.

Inequality Measures

As in previous fiscal incidence studies, the main inequality measure is the Gini Index. This index can also be used to evaluate redistribution by calculating the index for each income concept. For example, comparing the Gini index for market income with the Gini for disposable income helps to understand the extension of how the transfers and taxes can accomplish redistribution. This index can be estimated by $G_x = \frac{2}{\bar{y}^x}Cov(y_i^x, F(y_i^x))$.[14] Together with the Gini Index, the inequality analysis of Grenada's transfers and taxes includes different decile dispersion ratios (P90/P10, P90/P50 and P10/P50).[15]

Progressivity/Regressivity Analysis

Progressivity measures enable the understanding of the effects of fiscal interventions across the income distribution. The concepts of progressivity and the impact of fiscal interventions on inequality have been discussed extensively using well-known instruments such as the Lorenz curve (L) and concentration coefficients (CC), as well as the Kakwani disproportionality index $(\prod_T^k)$.[16] The last is the difference between the concentration index of a tax (C_T) and the Gini index of prefiscal revenue (G_x), expressed as $\prod_T^K = C_T - G_x$. The condition for a tax to be

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[13] With the exception of the final income, given that it is a complex task to monetize the in-kind transfers in order to evaluate poverty.

[14] Superindex x represents the different income concepts.

[15] The study implements also the Akinson and Generalized Entropy (G.E.) Measures. (Lustig, 2020).

[16] The Kakwani index is defined as the difference between the concentration coefficient of an intervention and the Gini coefficient of the base income. This index ranges from -1 to 1 and the higher its level, the more progressive the fiscal intervention under consideration. In the case of transfers, the index is defined as $K_m^{Trans} = -(D_m^{Trans} - G_m)$, while for taxes it is defined as $K^{Tax} = (D_m^{Tax} - G_m)$, where K is the Kakwani index, D_m^{Trans} is the concentration ratio of the considered transfer when the population is ordered as a function of market income, D_m^{Tax} is the concentration coefficient of the considered tax when the population is ordered as a function of base income, and G_m is the Gini index without the transfer/tax (base income index).

equalizing, neutral, or unequal is that $\prod_T^K > 0$, $\prod_T^K = 0$, or $\prod_T^K < 0$, respectively. In a framework of various interventions, taxes, and transfers, Lustig and Higgins (2018) use Lambert's conundrum for distinguishing progressivity from equalization, especially when assessing the overall fiscal outcome.

Based on an analysis of the distribution of tax policy interventions, Lustig and Higgins (2018) established criteria for whether taxes and transfers are progressive or regressive by looking at both concentration (*CC*) and Kakwani indexes (*Kk*). For taxes, the following rules are valid:

- ✓ Taxes are highly regressive if *CC* = 0 and *Kk* < 0
- ✓ Taxes are globally regressive if *CC* < Gini (market income) and *Kk* < 0
- ✓ Taxes are proportional if *CC* = Gini (market income) and *Kk* = 0
- ✓ Taxes are globally progressive if *CC* > Gini (market income) and *Kk* > 0

For transfers, the rules are

- ✓ Transfers are globally progressive in absolute terms if *CC* < 0 and *Kk* > 0
- ✓ Transfers are globally progressive if *CC* < Gini (pretransfer income) and *Kk* > 0
- ✓ Transfers are neutral in absolute terms if *CC* = 0 and *Kk* > 0
- ✓ Proportional transfer if *CC* = Gini (pretransfer income) and *Kk* = 0
- ✓ Transfers are globally regressive if *CC* > Gini (pretransfer income) and *Kk* < 0

APPENDIX E: REGIONAL COMPARISON OF GINI INDEXES

Table 8 Gini Coefficients for CEQ Income Definitions for Selected Countries

Country	Market income*	Disposable income	Consumable income	Final income
Grenada (2018)	**0.416**	**0.397**	**0.395**	**0.367**
Costa Rica (2010)	0.508	0.489	0.486	0.402
Dominican Republic (2013)	0.517	0.505	0.496	0.417
El Salvador (2017)	0.400	0.384	0.381	0.331
Guatemala (2014)	0.476	0.463	0.463	0.427
Honduras (2011)	0.577	0.571	0.568	0.506
Panama (2016)	0.557	0.534	0.529	0.432
Jamaica (2018)	0.367	0.361	0.358	0.351

Source: Own calculation (Grenada) and CEQ – Standard Indicators (2022).