Currency, Dollarisation and Inequality in Central America and the Caribbean[1]

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This paper explores the relationship between the extent of dollarization – the use of US dollars for local transactions in countries that have their own currencies – and the distribution of income in the small open economies (SOEs) of the Central America and the Caribbean. Because the US dollar is the currency in which all international transactions are priced, residents of the SOE who earn dollars are protected against depreciation in the value of the domestic currency; those who earn domestic currency, in contrast, bear the full brunt of currency depreciation on domestic prices. Over time, we should expect depreciation of the currency to result in a worsening of the distribution of income, for any proportion of dollarized incomes, because those with income in US dollars, who tend to be the wealthier segments of the income distribution, will be unaffected by the loss of purchasing power which the remainder of the population suffers. Further, in assessing the effects on income distribution, we need to take account of changes in the proportion of dollarized incomes, and the factors that might contribute to increases in dollarization, including exchange rate variability, instability of the balance of payments, the importance of tourism and remittances as sources of foreign earnings in the economy, and the country's proximity to the US. In addition, we must bear in mind that the distribution of income is affected by tax and public expenditure policies, as well as social and political factors, all of which are beyond the scope of the present study.

It is important for policy makers to recognise the distributional impact of their exchange rate and foreign currency management policies, because the consequences may well affect popular acceptance of the national economic strategy, and the prospects of its success. In the literature review which follows this introduction, it is noted that distributional effects were among the earliest concerns of trade economists, and the issue has attracted academic attention since then. However, although there is an enormous literature on income distribution, the issue has not been in the foreground of discussions on the choice of macroeconomic management policies and strategies. This paper advances the case for making the impact on income distribution an important focus of ongoing policy discussion and implementation.

Section 2 of the paper reviews the literature on trade, relative prices and income distribution; on the dimensions and measures of income inequality; on the prevalence of dollarisation; and on the importance of migrants' remittances as a source of foreign exchange, focussing on studies of Latin America and the Caribbean. Section 3 outlines a simple model of the impact of dollarisation on income distribution under different exchange rate conditions and in countries with difference levels of dependence on tourism and remittances. Section 4 describes the sources of data on inequality, dollarization, remittances and tourism for Central American and a selection of Caribbean economies. Section 5 scans and analyses the available data.

Literature review

The point of departure for discussions of the impact of relative trading prices on the distribution of income is the Stolper-Samuelson (1941) theorem, which relates increases in the relative price of a good to the return to the factor used most intensively in its production. Over the years, a large

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literature has grown to extend and qualify the basic model, takng account of skills differentiation within countries, changes in relative productivities, market imperfections, changes in tastes and technologies, and other factors. This thread of research and writing has gained new impetus with the ever-growing networks of international trade, inter-company and cross-border intra-company trade, as well as the international movements of capital, finance and labour. A comprehensive survey of the literature of this debate on globalisation and its impact on inequality in Latin America may be found in Dix-Carneiro and Kovak (2023). In the end they admit that it is difficult to draw conclusions from their literature survey, because of "the rich set of mechanisms linking trade to inequality" (page 50).

Studies which explore the impact of price changes on the distribution of income narrow the focus in line with the discussion in the present paper. In their paper on the pass-through of international inflation Glawe and Wagner (2024) find that inflation rates in excess of six percent are associated with higher income inequality, whereas correlation is insignificant below that threshold, for a panel of 101 countries for the period 1985 - 2020. High inflation will tend to increase inequality in countries where the poor consume relatively more tradable goods than do the more well-off.

The large and growing literature on dollarisation does not recognise the potential impact of the degree of dollarisation on the distribution of income. Studies such as Alvarez-Plata and Garcia-Herrero (2008), Castillo et al (2024), Cachanorsky et al (2021) and Hallren (2014) are concerned with the effect of dollarisation on monetary policy and the ability of the central bank to contain inflation, but the impact of inflation on the distribution of income is beyond their scope. Other dollarisation papers are concerned with factors affecting the degree of dollarisation, including Hanke (2021), Levy-Yeyati (2006) and Drenik and Perez (2020). The latter study, and Gondo et al (2020), both suggest there may be an optimal degree of dollarization for open economies.

Although there is no evident interest in the impact on income distribution, some studies have investigated the implications of financial dollarisation for the distribution of wealth (Christiano et al, 2021; Moreno-Villalaz, 2005); Ize and Levy-Yeyati, 1998). The most readily available measure of dollarisation is the proportion of financial liabilities that is held in foreign currency, but the question of interest with respect to inequality is the distribution of international spending power of domestic incomes. Where available, data on income shares, and prices and consumption baskets of different income groups would be preferable, but this data is seldom found. (An exception is Drenek and Perez (2021), a study of optimal choice of currency for retail price setting in Latin America.) For this reason the percentage of dollar deposits is typically used as the proxy for the true variable of interest, the percentage of income that is received in dollars.

The massive literature on international migration and remittances is concerned with their impact on national incomes, balance of payments and economic growth, with not much focus on distributional effects. Borjas (2015) and Carare et al (2024) are examples from the literature on Latin America.

The most frequently used concept of inequality is based on the distribution of income, but in the present study the international purchasing power of income is the focus. Others have used essentially the same concept as their starting point for devising optimal degrees of dollarisation, of prices, income or deposits. Closely related to inequality of income is the distribution of wealth, previously mentioned. In addition, there are wider concepts of inequality, such as measured by the UNDP's *Human Development Report*, which incorporates inequities in health and educational opportunities, along with the purchasing power of incomes (UNDP, 2022/23). McKinsey (2019) also includes equality of opportunity as an additional consideration.

A model of dollarisation and income distribution in small open economies

It is a characteristic of economies of the size of those of Central America and the Caribbean that the international prices of the imports on which their economies depend sets a floor on domestic inflation. In a model which is built around the structural characteristics of the SOE (Worrell, 2023, page 125), the domestic price level (p) is specified as:

1. $p = p_t(q_t/q) + p_n(q_n/q)$,

that is to say a weighted average of the world price measured in local currency equivalent (p_t) and the price of nontradable goods (p_n), where the weights are the shares of tradables and nontradables in total output, q_t/q and q_n/q. Unlike in large countries, these weights do not change in response to relative price movements. That is because, at the most reduced level of simplification, the economy of the SOE comprises no fewer than three goods, none of which can be substituted the others in production or consumption in response to changes in relative prices:

- A tradable good, produced at sufficiently large scale to be internationally competitive at ruling world prices - think tourism services;

- An import good, a composite of every kind of import, which cannot be produced locally at internationally competitive prices because the small economy lacks the capacity to produce such a variegated good - think petrol and diesel, machinery and vehicles, pharmaceuticals, wheat flour, cooking oil, etc., etc.; and

- A nontradable good - think supermarkets, public utilities and government administration.

Tradables and imports are exogenously priced on the international market. The price of nontradables is determined by a market adjustment process where producers plan the year's production based on their expectations of aggregate demand (a^*) and their most recent performance:

2. $q_n = f_1(a^*, q_n(-1))$,

and they adjust their prices and output as the year progresses in line with actual demand according to:

3. $p_n = f_2(q_n, p_t, ulc, r)$.

The new variables are the unit labour cost (ulc), assumed constant for the purposes of this exposition, and interest costs (r), which are equal to the international interest rate plus a country risk premium.

One additional factor affects the prices and output of nontradables: real monetary expansion, invariably the result of fiscal over-expansion ($\Delta MB/p$).

The price equation, incorporating nontradable market adjustment, is:

4. $p = \beta_t p_t + \beta_n f_3(q_t, \Delta MB/p, p_t, ulc, r, q_n(-1))$

where the price of tradables in local currency (p_t) is the product of the international price in US dollars (p_{us}) and the exchange rate (e):

5. $p_t = ep_{us}$.

Domestic prices are determined by international prices (p_{us}), the exchange rate (e) and the extent to which the financing of the public sector affects the prices of nontradables ($\Delta MB/p$). There is a complex relationship between real monetary expansion and the exchange rate given by the balance of payments equation, thanks to the impact of aggregate expenditure increases on the demand for imports:

6. $\Delta FXR = ep_{us}(q_t - m(q, \Delta MB/p)) + K$,

where *ΔFXR* is the change in foreign exchange reserves, *m* represents the functional relationship between imports and aggregate spending (comprising output and real monetary expansion), and *K* is net inflows on the capital account of the balance of payments. Through this relationship any monetary effects that do not show up in increases in the prices of nontradables will manifest themselves via changes in the exchange rate.

All other variables on the right hand side of Equation 4 are exogenous. The output of tradables (q_t) depends on the production capacity of the tradable sector; because the countries of Central America and the Caribbean are small, they may market internationally everything they are able to produce at the ruling world price. Changes in unit labour costs (*ulc*) materialise over the medium to long term as tastes, technologies, organisation and product qualities changes; in the short term we may take unit labour costs as constant. Thanks to the openness of financial markets throughout the Central American and Caribbean region, interest rates (*r*) are fully determined by US benchmark rates (r_{us}) and country risk premiums (*crp*), as explained in <mark>Worrell (2023, page 186</mark>):

7. $r = r_{us} + crp$

The national income is the product of prices and output:

8. $Y = pq$.

In order to capture the differential impact of dollarization on different income groups, let us divide the national income into upper, middle and lower income categories:

$Y = Y^u + Y^m + Y^l$.

Each income group has a proportion of income in US dollars which is denoted by $\beta_u, \beta_m, \beta_l$. The international purchasing power of each group's income (Y^u_{us}, Y^m_{us} and Y^l_{us}) is given by:

9. $Y^u_{us} = Y^u(1/e + \beta_u)$,

10. $Y^m_{us} = Y^m(1/e + \beta_m)$,

11. $Y^l_{us} = Y^l(1/e + \beta_l)$.

The questions of interest in this study are whether $\beta_u > \beta_m > \beta_l$, and to what extent the relationship between them may be affected by local spending by tourists and inflows of migrant remittances. If, as might be expected, $\beta_u > \beta_m > \beta_l$, domestic price inflation always worsens the distribution of income, but this effect may be attenuated to the extent that β_m and β_l are boosted by incomes from tourist services and remittances from abroad.

Data sources

The most useful measure of inequality for the purposes of our study is the distribution of income by income groups, deciles or quartiles. Income distribution by decile is available for the Central American countries and the Dominican Republic for selected years since 2000 from the <mark>*CEPALSTAT Databank*</mark>, of the Economic Commission for Latin America and the Caribbean (ECLAC). No comparable data is available for Caribbean countries. A second inequality measure, available for some Caribbean countries and all Central American countries, is the inequality-adjusted Human Development Index, iHDI, found in the *Human Development Report* (<mark>UNDP, 2022/23</mark>). The most widely available inequality measure, available for all countries in our sample, is the GINI coefficient, a measure of the deviation of the deviation of the estimated distribution from the line of perfect distribution, where every income earner gets an identical share of total income. The United Nations University World Institute for Development Economics Research (UNU WIDER) has compiled a

comprehensive *World Income Inequality Database* (<mark>UNU WIDER, 2023</mark>) which assembles GINI coefficients for Central American and Caribbean countries for various years spanning a period from the 1950s to the present.

Data on exchange rates to the US dollar are readily available, and consistent series going back to the 1950s and 1960s may be downloaded from the International Monetary Fund's *International Financial Statistics* database. Panama and El Salvador have no local currency, while there has been no change in the US dollar values of The Bahamas, Barbados and Belize since 2000. Market exchange rates are used in cases where they differ from the official rate.

There is no clearly defined data on dollarisation available for comparative analysis of the countries of Central America and the Caribbean. <mark>Castillo, Lama and Medina (2024)</mark> provide data on the percentage of financial dollarisation in a few countries. <mark>Drenik and Perez (2020</mark>) is a unique source of pricing in US dollars for various categories of purchases for five countries in the sample. These studies provide a more in-depth assessment of the pervasiveness of dollarisation than does the more readily available indicator, the percentage of domestic deposits which are denominated in US dollars rather than local currency, and which may therefore be used directly for foreign purchases, without the need for currency conversion.

There remains some ambiguity about the definition of foreign currency deposits, however, because in some Caribbean countries - and perhaps in Central America as well - banks may limit account holders' overseas payments and transfers even though their funds are dominated in US dollars, whereas in other countries local currency deposits are converted for payment abroad on demand, and are employed in much the same way as foreign currency deposits. Because of these ambiguities, the measure used in our study, taken from the *International Financial Statistics*, is the ratio of the banks' holdings of net foreign assets to domestic deposits. The strength of this ratio as a proxy is that it represents the banks' capacity to accommodate foreign currency payments, whether from deposit accounts denominated in local or foreign currency. Since our interest is in the deposit holder's access to US dollars to protect the spending power of their deposits, this seems a defensible choice of proxy.

The final variables of interest are the percentages of tourist receipts and migrant remittances in total foreign currency inflows in Central American and Caribbean countries, series which are downloaded from the *CEPALSTAT Databank*.

A scan of the available evidence

Table 1.

| | Summary Data | | | | |
	GINI	ER Change	Dollarisation	Travel %	Transfers %
Bahamas	53.3	0	24	71	5
Barbados	47	0	16	55	2
Belize	53.1	0	29	50	11
Costa Rica	47.2	163	19	12	3
Cuba	38	2380	0	68	0
DR	37	361	27	23	27
El Salvador	38.8	0	100	14	42
Guatemala	48.3	100	31	3	50
Guyana	44.6	113	26	0	8
Haiti	41.1	587	42	3	78
Honduras	52.1	164	27	4	14

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Jamaica	35	346	31	36	31
Nicaragua	46.2	281	35	5	32
Panama	49.9	0	100	7	2
Puerto Rico	53.1	0	0	0	0
Suriname	39.2	1385	56	6	7
T&T	39	108	60	3	4

Summary data on the 17 Central American and Caribbean countries discussed in this study are shown in Table 1. There are six countries that either have no currency of their own, or where the local currency has maintained an unchanged value in terms of the US dollar throughout the period of our analysis: The Bahamas, Barbados, Belize, El Salvador, Panama and Puerto Rico. In Figure 1 we compare levels of inequality in these countries with all other countries in the sample, using the GINI coefficient as our measure of inequality. The coefficients for the countries where there has been no change in the transaction value of money in terms of US dollars have GINI coefficients ranging from a high of over 50 percent to a low just under forty percent, indicating relatively high levels of inequality. The range of GINI coefficients for the remainder of the sample is much the same as for the fixed rate and fully dollarised countries. Jamaica, where the exchange rate depreciated 346 percent between 2000 and September 2024, shows the lowest GINI value in the sample, 35 percent, whereas The Bahamas, Belize and Puerto Rico recorded the highest levels of inequality, with GINI coefficients all about 53 percent. The coefficient of determination between exchange rate changes and GINI index scores is -0.24, too low to be the basis for any inference about the relationship.

Figure 1.
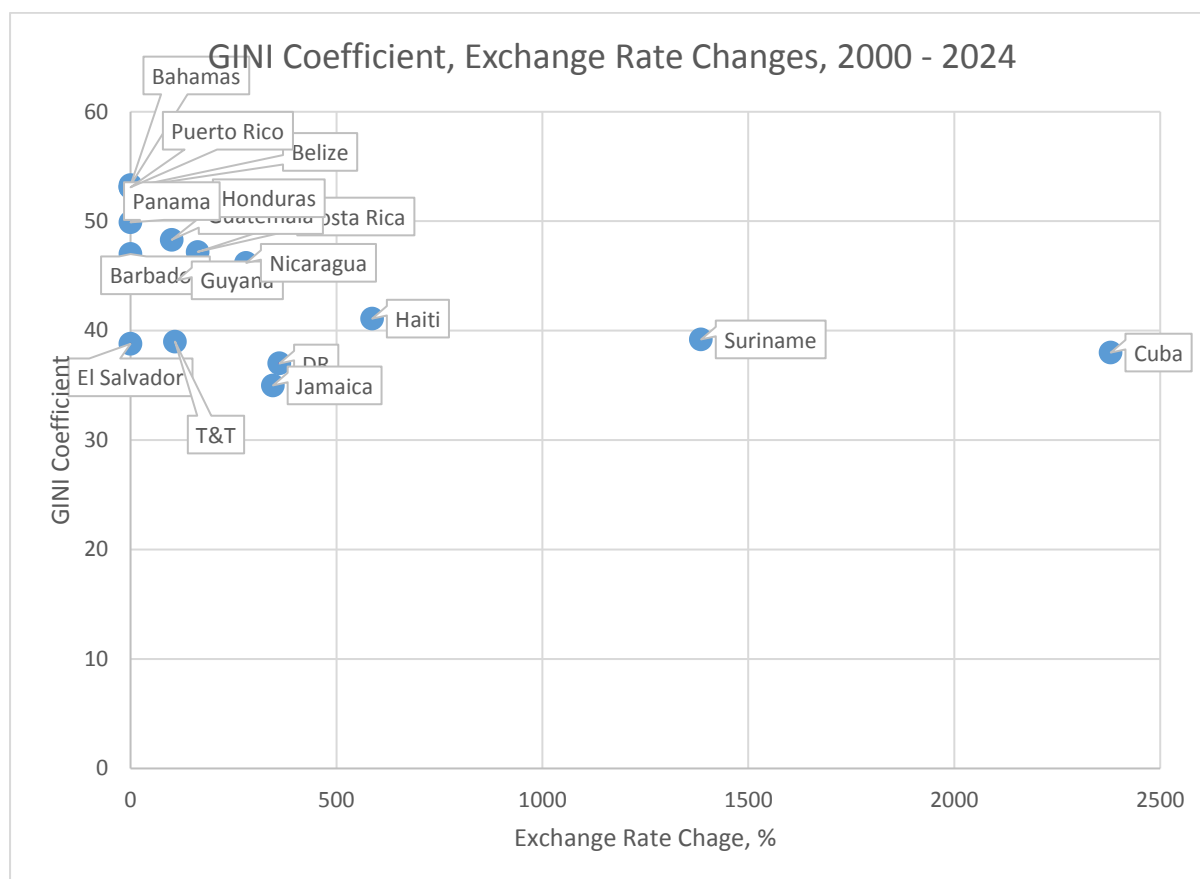
There are seven economies in the sample that derive more than 20 percent of their foreign currency inflows from tourism: The Bahamas, Barbados, Belize, Cuba, Jamaica, the Dominican Republic and Puerto Rico. Except for Puerto Rico, where US dollars are local currency, these countries all had levels of dollarisation that were no higher than countries less reliant on tourism, all recording net foreign assets below 40 percent of deposits (Figure 2). What is more, Suriname and Trinidad and Tobago, both mineral exporters with little tourism, were the most dollarised countries in the sample, at 60 percent. However, the relationship, with a coefficient of determination of 0.13, suggests that there is no relationship between the significance of the tourist industry and the extent of dollarisation of the economy. There is, in this case, an additional consideration, beyond the impact of tourism on the supply of foreign currency: the stability of the US dollar value of the local currency. In countries where that value has been unchanged over many years, there may not be much demand for foreign currency deposits, even when foreign currency is readily available. That may be a factor in the cases of The Bahamas, Barbados and Belize.

Figure 2.
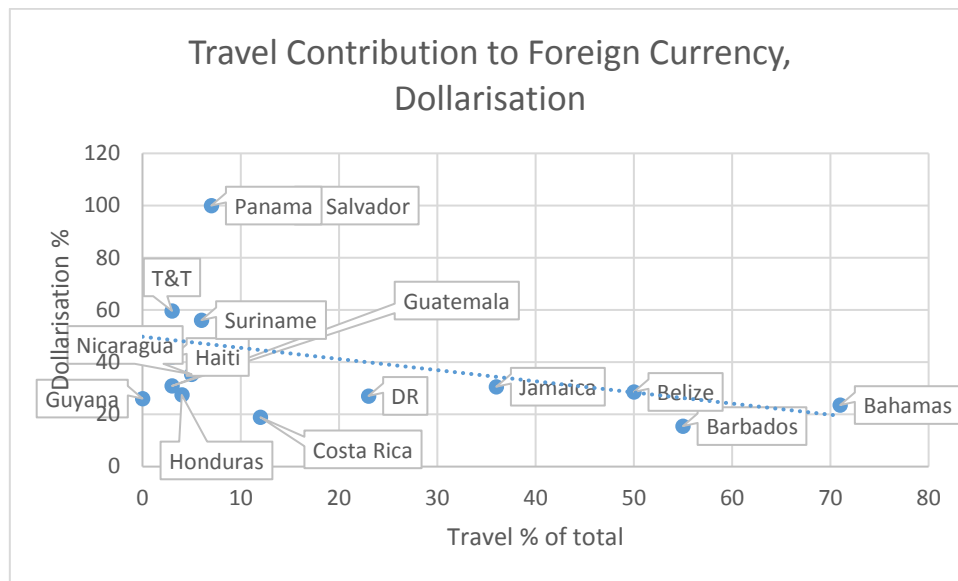
There are six countries in the sample where migrants' remittances account for more than 20 percent of foreign currency inflows: Haiti, Guatemala, El Salvador, Jamaica, Nicaragua and the Dominican Republic. Of these, El Salvador does not have a domestic currency. The remittance-dependent countries do tend to have somewhat higher levels of dollarisation than countries where remittances are less significant, but once again the coefficient of determination is too low to warrant any conclusion, at 0.01 (Figure 3).

Figure 3.
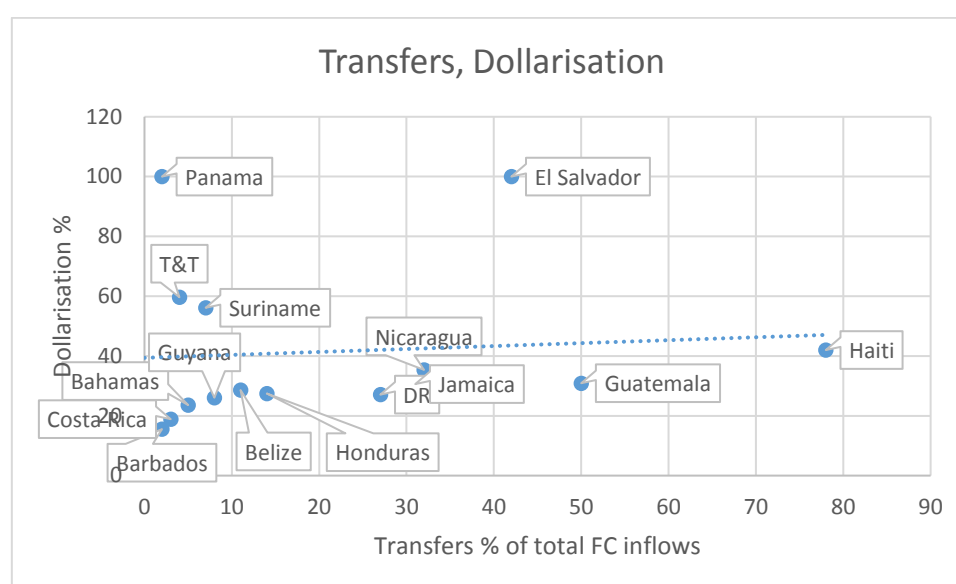
Improvements in the GINI coefficient over time

Among the economies which have an important tourist industry, those that are fully dollarised or securely pegged to the US dollar have not improved much on their relatively high levels of inequality. The GINI value for The Bahamas remained little changed over the period 1970 to 2013, with an average in the mid-40s percentages. The most recent reported figure was above 50 percent. In the 1950s the GINI for Barbados was in the mid-40s percent. There was significant improvement in the 1960s and 1970s, but by 2017 equality was measured at levels no different than in the 1950s. In Puerto Rico the GINI coefficient worsened over a similar period, from around 40 percent to over 50 percent. (Historical information is not available for Belize.)

The three other tourism-dependent economies, all with depreciating exchange rates over the years, recorded reductions in levels of inequality. Between the 1950s and the early 2000s, Cuba's GINI index fell from the mid-50s percent to somewhat less than 40 percent. In the late 1960s, the GINI coefficient for the Dominican Republic was in the mid-40s percent; although inequality worsened in the 1990s and 2000s, by 2021 the GINI was below 40 percent. Jamaica's GINI coefficient was recorded as high as 60 percent from the 1950s to the 1980s, but it fell below 40 percent in the 1990s, and it has since remained around that value.

A majority of the remittance-dependent economies recorded improvements in levels of inequality, both El Salvador, a fully dollarised economy, and the three economies which experienced substantial exchange rate depreciation, the DR, Jamaica and Nicaragua. El Salvador recorded GINI coefficients around 50 percent in the early 1960s, and there was little change until the turn of the century. However, improvement thereafter was significant, for a value below 40 percent in 2021. In the 1990s and early 2000s, Nicaragua recorded GINI coefficients in the mid-50s percent; by the 2010s the value had been reduced to the mid-40s percent.

Once we have taken account of the five countries where tourism is the main source of foreign exchange, the four countries that depend heavily on remittances, and the two countries (the DR and Jamaica) they are both significant sources of foreign currency, five countries remain of our sample of 17 countries. Panama, where earnings from the operation of the trans-oceanic canal and exports of pharmaceuticals, clothing and household items are supplemented by small but significant tourist revenues, is the only country in this group that has a fully dollarized economy. In the early 1990s the

country's GINI index was almost 60 percent, and though there was improvement in the 1990s and 2000s, in 2021 the GINI had fallen only just below 50 percent.

The other countries in this group all had currencies that depreciated in terms of US dollars between 2000 and 2024, but experiences varied with respect to reductions in inequality. In Guyana, an exporter of oil and gold, inequality levels were reduced somewhat between the mid-1990s and the mid-2000s. The GINI coefficient for Honduras, an exporter of agricultural products and clothing, was in the region of 60 percent in the late 1960s; improvements in the past decade and a half reduced the index to the high 40s percent. In Costa Rica, an exporter of light manufactured goods which earns substantial foreign income from traded services and tourism, levels of inequality worsened, with the GINI index moving from the mid-40s percent in the 1960s to near 50 percent in 2021. Levels of inequality also worsened in Suriname, an exporter of minerals, where the GINI index went from 30 to almost 40 percent between the 1960s and 2022. In Trinidad and Tobago, an oil exporter, there has been no significant change in the GINI ratio since the late 1950s.

Alternative measures of income distribution

The relationship between domestic currency valuation and income inequality becomes no clearer when we use alternative measures of inequality and different sources of information. Figure 4 shows the relationship for the eleven countries for which data is available from the most recent issue of the *Human Development Index* (UNDP, 2022/23). The picture is somewhat different from that presented in Figure 1, but the general conclusion that there is no statistical evidence of a relationship holds, with a coefficient of determination of only 0.26.

Figure 4.
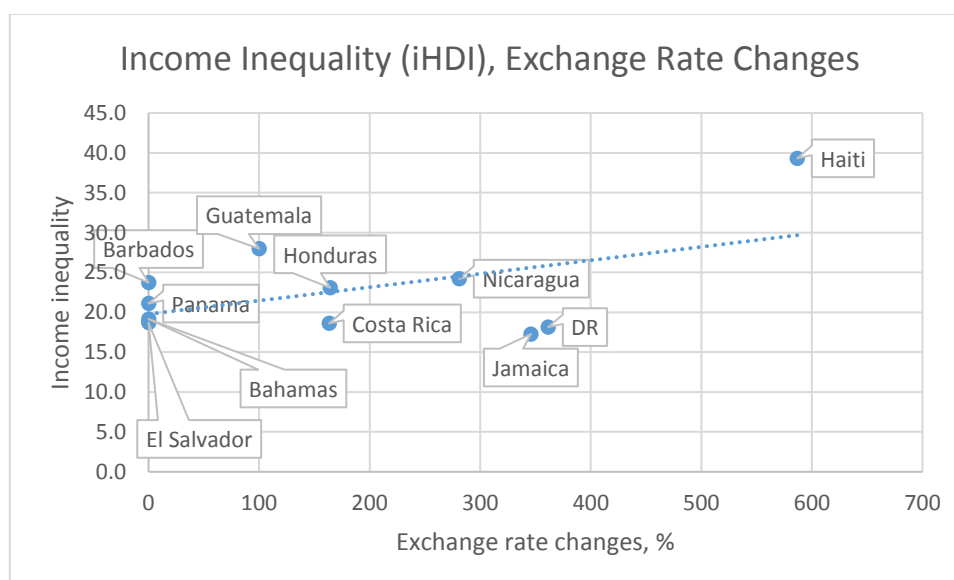
The *CEPALStat* database (ECLAC, 2024) provides a breakdown of income distribution by deciles, but unfortunately it is available only for the Spanish-speaking countries of our sample. A preliminary scan of this data appears in Figure 5, which charts the ratio, for each country for each selected year, of the richest to the poorest decile. For example, the value for Panama in 2022 is 33, meaning that the richest ten percent of Panamanians had 33 times the income of the poorest ten percent in that year. That was the most unequal of the five countries shown, and more unequal than the average for Latin

America and the Caribbean (LAC), but it represents a big improvement for Panama since 2000, when the top ten percent were 61 times richer. Honduras was the other country that had worse income distribution than LAC, in the early 2000s and most recently; as for Panama, the income distribution did improve over the two decades.

Figure 5.
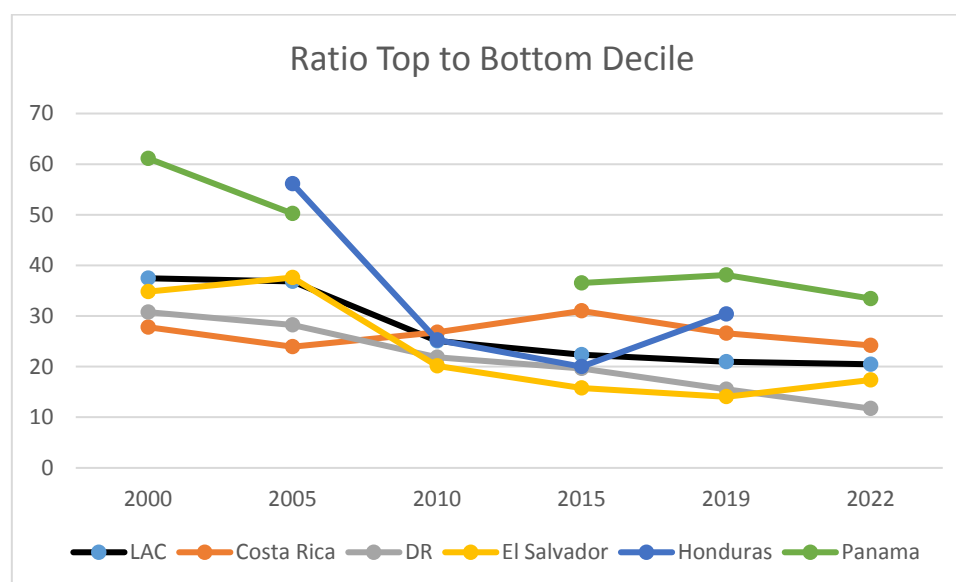
Income distribution for LAC improved from a situation where, on average for the region, the top incomes were 37 times the value of the bottom ten percent in 2000, to a regional average of 20 times in 2022 (for the countries which submitted data to ECLAC). Income distribution in El Salvador and the DR was less unequal than the LAC average in 2000, and the distribution improved in line with the regional average, so that they continued to enjoy less unequal distribution than average in 2022. The distribution of income also improved in Costa Rica, where the richest ten percent's share was 28 times that of the poorest in 2000, the best of the countries shown. However, the modest improvement, to 24 times in 2022, left Costa Rica above the regional average. This data on income by deciles is most promising for further research on the impact of dollarisation on the distribution of income.

An interim assessment

Policy makers have woken up to the importance of income distribution effects of economic policies, a matter which had until recently not attracted much interest. While the globalisation debate has ignited research on the impact of trade policy on income distribution, it is still the case that distributional effects are not at the centre of analysis in the design of economic adjustment strategies and decisions affecting the balance of payments and the exchange rate. Ignoring the distributional effects of exchange rate changes can prejudice the success of the exchange rate strategy, to the extent that the wealthy are able to escape the loss of purchasing power suffered by the rest of society when the local currency depreciates in value. The paper makes the case that exchange rate changes have adverse distributional effects because of unequal degrees of dollarisation, and therefore unequal protection from the erosion of international purchasing power of local currency due to exchange rate depreciation. This is an especially important consideration for SOEs such as the countries of Central America and the Caribbean, because of their international price dependence.

The redistributional effects of exchange rate depreciation do not show up in the national inequality statistic for any of the 17 Central American and Caribbean countries in our sample, using any of the available measures of inequality, even after we factor in the possibility that remittances and provision of local services to tourists may have increased the percentage of dollarization of lower income groups. Our working hypothesis is that our failure to detect effects on inequality is as a result of the many other factors which also affect the distribution of income, as discussed in the literature survey. Work continues to untangle these many influences, in order to estimate how large an impact exchange rate changes have on inequality.

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