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Estimating Household Distribution of Inflationary Conditions: Suriname

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Estimating Household Distribution of Inflationary Conditions: Suriname[1]

ABSTRACT

This paper aimed to study the impact of inflation across social groups in Suriname for the period 2016-2022. In using data from the Survey of Living Conditions 2016/2017, the paper estimated inflation rates across different income groups, which were divided into quintiles. The paper results showed that the gap between published inflation and the inflation per income category and the inflation between the different income groups was, on average, lower during periods of relatively low and stable inflation. Moreover, even though income groups faced different inflation rates each year, the differences were not significant for the period 2017-2021, while higher food prices and utility prices in 2022 did translate into much higher inflation rates for low-income households than for high-income households. Policy should aim at keeping inflation at a low and stable level as well as to control inflation stemming from especially food and utility price shocks.

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Chapter 1: INTRODUCTION

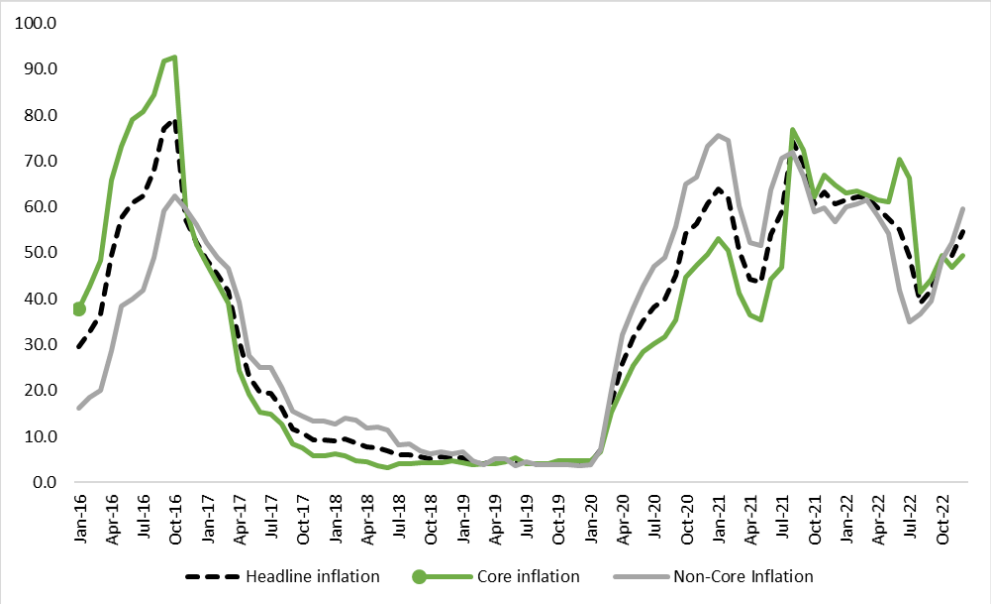
Policymakers typically use an aggregated price index, such as the Consumer Price Index (CPI), to measure inflation. However, an aggregate price index is based on an aggregate consumption bundle and average prices for various goods and services (Kaplan, Schulhofer-Wohl, 2017). For example, CPI measures the changes in the prices of a wide range of goods and services purchased by the average household. As long as households consume the same bundles of goods and services included in the average household basket, CPI will be a perfect indicator of inflation at the individual household level. In practice, however, this is not the case since consumption patterns among households differ, and each household has its own weights for each good and service in their consumption basket. Consequently, if a household basket differs significantly from the average CPI basket, then the inflation rate experienced by that household will differ from the official published inflation figures (Tavares 2021).

The differences in consumption patterns add to inflation heterogeneity across different population groups. There are several reasons why low-income households may experience higher inflation rates than households with a higher income (Fessler & Fritzer, 2013; Jacobs et al., 2014; Loewald & Makrelov, 2020; Basso et al., 2023). First, contrary to richer households, poor households spend more of their income on basic need goods (such as food, transportation and utility). Because basic goods are difficult to substitute and therefore tend to have an inelastic demand, reducing spending to minimize price shocks on these goods is very difficult. Poor households also save less and are more liquidity-constrained than high-income households, and therefore have less room to buffer sharp increases in their cost of living through savings. Likewise, Boskin and Hurd 2022, showed that elderly households spend more of their income on basic needs than younger households. Compared with the non-elderly, older people spend a larger share of their income on food, utility and healthcare, and therefore tend to experience higher inflation than non-elderlies. In addition, a household in a rural area tend to face higher inflation than those in the urban area, especially those with a lower income. This is because compared to the urban area, food commodities tend to be higher in the rural area. In addition, urban workers whose incomes are indexed experience comparatively lower rise in prices during high inflation periods while the unorganized rural workers, particularly the agricultural and other laborers, with no protection to their incomes and employment have to face severe brunt of the inflation (Sawanat, 1994; Sugema et al., 2010; Niftiyev 2020; Paul & Sharma 2019).

Suriname has experienced volatile inflation rates over the period 2016-2022, ranging from single digit to double digit inflation figures (Figure 1). Much of the inflation came from high food and transportation prices

since core-inflation (headline inflation excluding Food and Non-Alcoholic Beverages and Transportation) has been relatively lower over the period in comparison to non-core inflation (Food and Non-Alcoholic Beverages and Transportation). High international food and energy prices, along with an increase in international container transport costs, are some of the external factors that drove inflation. The domestic factors included the increase in utility prices, following the reduction in subsidies on utilities, the shift to market-based fuel prices and the depreciation of the local currency. The rise in food, energy and utility prices has increased remarkably in recent years in Suriname. This gives rise to the question how these price changes have affected the different income groups in Suriname, especially the poorer community as according to the Survey of Living Conditions 2016/2017 (Inter-American Development Bank (IDB), 2018) they spend much of their income on basic need goods such as food and utility.

Figure 1: Year-on-year inflation rate developments, 2016 – 2022 (per cent, %)



Source: General Bureau of Statistics in Suriname

This paper aims to study the impact of inflation across social groups in Suriname for the period 2016-2022. The purpose of this paper is twofold. First, to analyze the inflation rates across different households the paper divided the households into quintiles, using data from Survey of Living Conditions 2016/2017. By decomposing the expenditure shares into socioeconomic strata (quintiles) and analyzing the different inflation rates among those groups, we identified, the cost factors affecting poor and vulnerable populations. Second, we also investigated how each computed inflation of each quintile differs from the reported inflation rate. This enables us to know how representative the official inflation rates are, since the

last Household Budget Survey on which the weights of the official inflation components are based dates from 2013-2014. Using the weights calculated based on the data from the Survey of Living Conditions 2016/2017, the reality of inflationary pressures according to the relative expenditure patterns of the households are revealed.

The importance of this study lies in the fact that at the time of writing this paper, inflation and its impact on the society is a topic of interest for policymakers and especially for central banks. Inflation, which had already reach elevated levels in many countries as a result of supply–demand imbalances and policy support during the pandemic, saw a further upswing due to the Russian-Ukraine war that caused disruptions in commodity markets and to supply chains. For Suriname, as a small open economy state who heavily depends on imports and is categorized as price taker, the above global events had an immense effect on the country's inflation developments.

Moreover, at the time of writing this paper Suriname has been implementing a structural reform. In December 2021, the government of Suriname entered into a 36-month Extended Fund Facility arrangement with IMF for US$ 688 million. The aim of the agreement is to support the authorities' homegrown economic plan to restore fiscal sustainability, reduce public debt, upgrade the monetary and exchange rate policy framework, stabilize the financial system and strengthen institutional capacity. Some of the measures in the agreement, like the reduction in subsidies on utilities, the shift to market-based fuel prices and a market-based exchange rate, have contributed to inflation. Acknowledging the disproportionate burden that high inflation imposes on the poor, the government had increased cash transfers to the poor. However, according to the IMF the government has not been fully successful in the implementation of its social program as they failed to meet their social spending objectives. The results of this study can guide policy makers in terms of designing adequate poverty alleviation programs. If inflation has a substantial effect on low-income households, than the government should seek to composite these households.

The rest of the paper is structured as follows: Chapter 2.2 briefly reviews literature on inflation measurements and specific-group inflation rates; Chapter 2.3 describes the data and methodology used for our estimations; Chapter 2.4 presents our results; Chapter 2.5 includes the conclusion and some policy recommendations.

Chapter 2: LITERATURE REVIEW

The impact of inflation on different groups of the society has been a matter of study over the last decades. In the United States, Arrow (1958) and Snyder (1961) were the first authors to present studies on this issue. Arrow (1958) noted that people with low income have different spending patterns than high-income groups as they spend a larger share of their income on basic needs. Snyder (1961) produced experimental indices for low and high-income groups concluding that, during recessions, the price of inferior commodities and other commodities of greater importance to low-income groups decreased more slowly than commodities associated to middle and high-income groups. During inflationary periods, inferior commodities tended to increase faster than the rest.

In Spain, Basso et al., 2023, found that inflation decreases with households' real income, which indicates that poorer households are more exposed to surges in inflation. The authors also established that households with more members and whose main earner is less educated, older and male tend to experience higher inflation. Fessler and Fritzer (2013), show in the case of Australia a strong and stable negative relationship between income and inflation that reflects the differences in consumption bundles along the income distribution (2010–2012). Furthermore, inflation decreases as education levels increase. Inflation was also higher for blue-collar worker households but was very low for farmer households. The authors have also found that the relationship between age and inflation tends to follow a u-shaped relationship.

In the case of developing countries, Sugema et al. (2010) show that, in Indonesia, rural poor households were more vulnerable to economic shocks, especially inflation. Rural poor households experience a more severe impact due to price fluctuation on food, which shocks tend to be larger on poverty compared to non-food. For India, Paul and Sharma (2019) analyzed the pattern of inflation rates for the periods 2005–2006 and 2011–2012 and examined whether inflation fluctuation in 2011–2012 hurt the poor more. The authors observed that prices of primarily foodstuffs like eggs, fish, and meat were substantially higher than other commodities like footwear and beverages. In addition, the impact of inflation on the poor varied not only across both rural and urban areas but also across the two time periods. The study reveals that the bottom thirty per cent of the population in rural areas observed the same inflation rate as their urban counterparts during 2005-2006. Lieu et al. (2004) studied the case of Taiwan and were able to conclude that different household groups face different price changes. The

poorest group faced a significantly higher inflation rate than the rest of the population, amounting to 0.15pp annually. In the case of the Trinidad and Tobago, Mahabir et al., (2016) study reveals that the highest inflation pass through occurs in those households falling into the lower income categories as well as households with 4 or more children, households living in squatted accommodation and instances and where the head of the household has no formal education and is unemployed. The results also indicate that the age and gender of the head of the household, as well as the size of the household, do not significantly influence the level of inflation faced. Notably, the differential between the various groups was marginal at lower rates of inflation. Contrary to all the previous studies, in South Africa, Oosthuizen (2007) shows that, between 1998 and 2006, neither the poor nor the rich faced consistently higher inflation rates. Even though income groups faced different inflation rates each year, the differences were not significant when looking at the whole period.

Overall, all studies tend to confirm that consumption patterns differ between households. These differences affect the inflation that each one suffers, leading to a large dispersion of price indices. Despite this, there is no consensus on the persistence over time of larger price indices for some groups, with only some studies concluding that poorer households experienced consistently higher inflation rates.

Chapter 3: DATA AND METHODOLOGY

Chapter 3.1: DATA COLLECTION

For our analysis, we used the Suriname Survey of Living Conditions: 2016-2017, published by the Inter-American Development Bank (IDB). The survey was a joint effort of the IDB, supported by the state-owned Electricity Company Suriname and the Central Bank of Suriname. The main objective was to collect reliable and timely information regarding the living standards of all population groups in order to support poverty analysis and poverty alleviation, policy planning in all sectors of the economy and to obtain objective baseline indicators to design adequate IDB projects. The survey was executed between October 2016 and September 2017 (12 full months of fieldwork) to capture seasonality and was conducted on around 2,100 households in all 10 districts of Suriname. Data was collected on all main aspects of living conditions such as education, health, housing and employment. Information on consumption patterns, income and expenditures of the Surinamese households were also collected with the intention to update the Consumer Price Index basket and inform the System of National Accounts.

The paper specifically used data containing household consumption and expenditure patterns. We use the consumption aggregate and sub-components to obtain a representative basket of goods and services. Because the aggregated consumption components of the survey had different sub-components than the national CPI components, we constructed our own aggregated consumption to match the sub-components of the national CPI. Similar to the national CPI, we aggregated all the sub-components into 12 main categories. Table A. 1 in Appendix 1 presents the match between the aggregated consumption and the CPI and shows each of the 12 main categories and their sub-components. With these 12 categories, we will study the differences between groups of goods.

The data on CPI and inflation were extracted from the General Bureau of Statistics in Suriname. For the analysis, we only use headline CPI and inflation rates.

Chapter 3.2: METHODOLOGY

The headline inflation rate of a country is usually computed based on the price changes of items in a predetermined basket of goods and services. This basket is measured as a nationally representative collection of expenditures on major commodity items and services as calculated from the respective country's most recent Survey of Living Conditions, Household Budget Survey, or Income and Expenditure Survey. The categories often included in baskets throughout the Region includes measures of food, non-alcoholic beverages, alcohol and tobacco, housing, clothing, medical items and services or health expenditures, transport including taxi fares and cost of vehicles, communication, education, recreation and culture, and miscellaneous items.

To compute the rate of headline inflation, which is often represented as the annual average changes in the overall basket's total price, the Laspeyres price index (LPI) provides the price change for the average household between the current time (current month or year) and the most recent equivalent period before (respective month or year). In theory, the LPI requires the presence of quantity and price indicators; however, quantity is often only available at the time of the national survey of expenditures and as such, this is constructed as a baseline where prices are measured, and quantities are used to define the weight or shares of expenditures on the respective items. In subsequent periods of measurement, the quantity is held constant and constructed as an inherent weighting of the shares of expenditures and prices are allowed to change based on market surveys of the respective items. This allows for the index to measure

the change in expenditure on the items of the basket allowing for price changes but keeping the quantity constant.

The LPI is denoted by the formula:

$$LPI_t^h = \sum \frac{Q_{io}^h P_{it}}{\sum_{t=1}^{n} Q_{i0}^h P_{i0}} \times 100$$

Where: Q is quantity consumed; P is base year price and t is time

To account for the missing data on quantity in the subsequent years, the LPI is modified to hold the expenditure shares constant. This is done by adjusting the formula to reflect the weight of the items consumed in the base year (W). As such, the formula is adjusted to:

$$LPI = \sum w_{io}^h (\frac{P_{it}}{P_{io}}) \text{ *}100$$

Where,

$$W_{io}^h = \frac{Q_{io}^h P_{i0}}{\sum_{t=1}^{n} Q_{i0}^h P_{i0}}$$

This study takes the analysis of inflation a couple steps further and seeks to separate the basket of goods into five strata representing the various socioeconomic groups captured in the Survey of Living Conditions: 2016-2017. To do this, the expenditure basket was split into five equal shares representing the quintiles of expenditure. This allows the inherent shares of expenditures to be disaggregated more closely through each socioeconomic group rather than using a national representative measurement that may mask differences between the lowest quintile and the highest. Traditionally, quintiles 1 and 2 spend more on food and housing, while quintile 5 has a larger share on transportation and consumer durables. As such, the formula used in this study for inflation is denoted as:

$$LPI = \sum QI_{i=1}^{5} (w_{io}^h (\frac{P_{it}}{P_{io}})) \text{ *}100$$

Where,

QI is the expenditure quintile.

Once the respective inflation rate for each quintile is computed, these are compared to the national average to show the dispersion of price pressures according to socioeconomic strata. Importantly, the commodity level inflationary pressures in each quintile can further break this down; much like is done at the national level. To do this, the P and Q variables will be split into their component parts and then re-measured for commodity specific inflation rates. This does not require a change in the formula, but rather just the separation of the commodities into sub-groups rather than computing the overall basket at once.

A similar representation of this is:

$$LPI = \sum QI_{i=1}^{5}(\sum C_{i=1}^{n}(w_{io}^{h}(\frac{P_{it}}{P_{i0}}))) \ *100$$

Where,

C is the commodity subgroups

Chapter 4: RESULTS AND DISCUSSION

During 2016-2017, the average spending of the first quintile on the commodities in CPI- basket was around SRD 434. The average spending of the highest quintile, the fifth quintile, equaled SRD 3201. Across all quintiles, it is evident that a large portion of the income is spend on food and non-alcoholic beverages, Housing and Transport. This aligns with the higher weights assigned to these category in the official CPI basket.

Table 1: Consumption by expenditure in different quintiles in real 2017 SRD prices

Categories		I	II	III	IV	V
1	Food and Non Alcoholic Beverages	155	264	350	468	847
2	Alcoholic beverages and tobacco	5	11	16	18	55
3	Clothing and Footwear	8	14	20	34	79
4	Housing and Utilities	140	207	268	360	637
5	Household Furinishing	27	40	59	76	141
6	Health Care	10	16	25	56	123
7	Transportation	33	80	139	207	530
8	Communication	19	31	46	84	185
9 and 10	Recreation, Culture and Education	22	31	48	69	227
11	Food Away form Home	15	26	46	76	258
12	Miscellaneous goods and services	0	3	4	11	119
Total		**434**	**725**	**1,020**	**1,460**	**3,201**

Source: Author's own calculation.

Furthermore, Table 1 shows that in nominal terms, the highest quintile spends more on food and non-alcoholic beverages (SRD 847) compared to the lowest quintile (SRD 155). However, in relative terms the lowest quintile spends more of their income on food and non-alcoholic beverages as shown in Table 2. The lowest quintile also spend more of their income on Housing and Utility compared to the highest quintile. In the case of transportation, the highest quintile tend to spend much more on transportation than the lowest quintile. This might be because poorer people usually depend on bus-transportation. However, bus prices are heavily subsidized in Suriname.

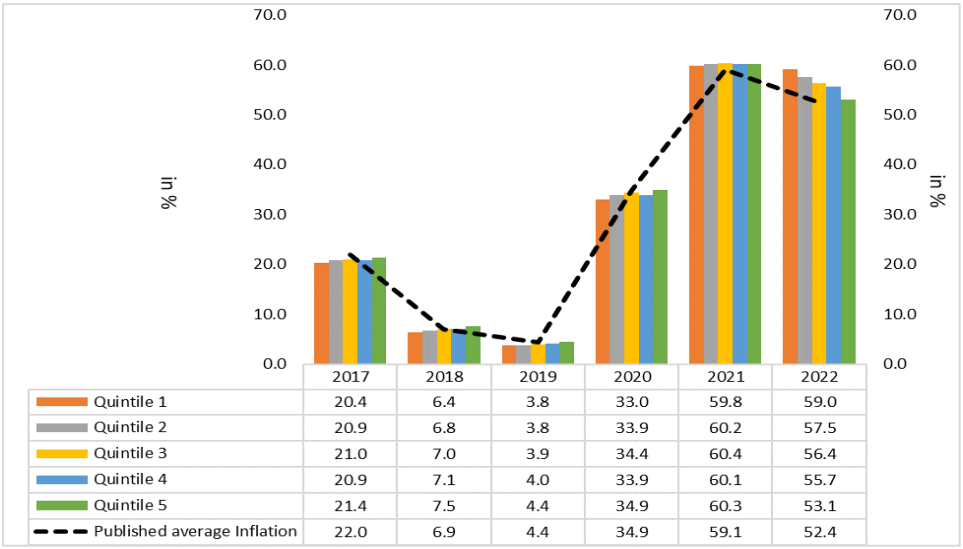
Table 2: Relative Consumption by expenditure in different quintiles in real 2017 SRD prices

Category		I	II	III	IV	V
1	Food and Non Alcoholic Beverages	35.7%	36.5%	34.3%	32.1%	26.5%
2	Alcoholic beverages and tobacco	1.1%	1.5%	1.5%	1.3%	1.7%
3	Clothing and Footwear	1.9%	1.9%	2.0%	2.3%	2.5%
4	Housing and Utilities	32.3%	28.6%	26.3%	24.6%	19.9%
5	Household Furinishing	6.2%	5.5%	5.8%	5.2%	4.4%
6	Health Care	2.4%	2.3%	2.5%	3.8%	3.9%
7	Transportation	7.5%	11.0%	13.6%	14.2%	16.6%
8	Communication	4.3%	4.3%	4.5%	5.7%	5.8%
9 and 10	Recreation, Culture and Education	5.1%	4.3%	4.7%	4.8%	7.1%
11	Food Away form Home	3.4%	3.6%	4.5%	5.2%	8.1%
12	Miscellaneous goods and services	0.1%	0.4%	0.4%	0.8%	3.7%
Total		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Author's own calculation.

The results of the quintile specific inflation rates in Figure 2, illustrates that each income group faced inflation different from the published inflation rates. The gap between the published average inflation and the inflation per income category and the inflation between the different income groups was on average lower during periods of low inflation (2018 and 2019), while the opposite holds for high inflation periods. This highlights the need to keep inflation low, as this will help minimize inflation disparity among different income groups.

Figure 2: Quintile specific inflation rates versus published average inflation rates

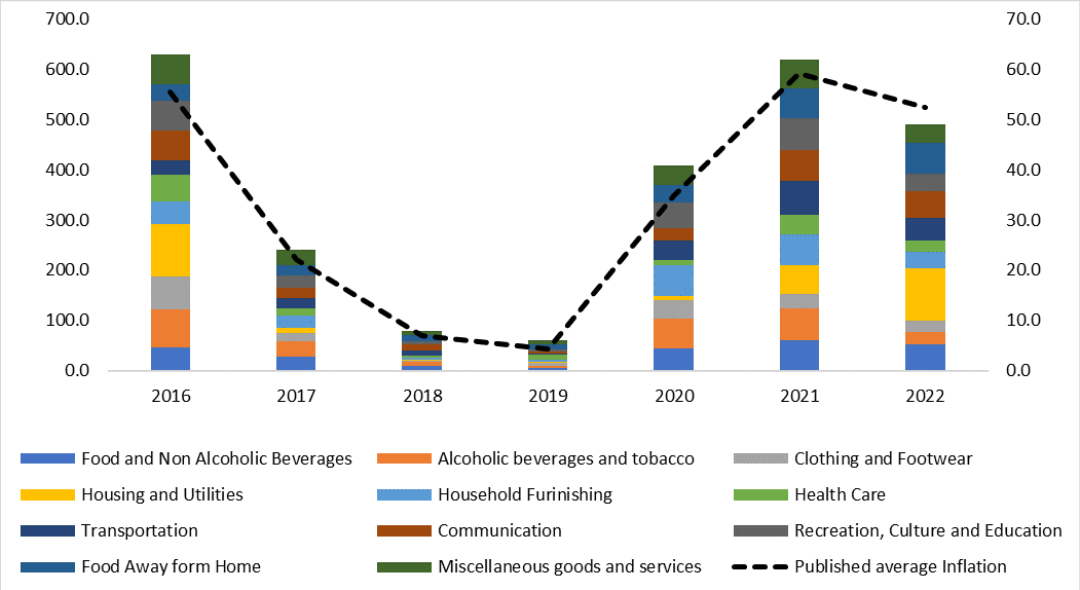


Source: Author's own compilation and General Bureau of Statistics Suriname. Note: Quintile 1 until Quintile 5 figures are presented on the left hand y-axis. Published average Inflation figures are presented on the right hand y-axis.

Furthermore, during 2017-2021 the low-income groups did not perceive significant higher inflation rates than the high-income groups. Surprisingly this even holds for the year 2021 when inflation was the highest for the study period. In 2022, when prices kept increasing, even though at a slower peace, and inflation remained elevated level, the results from figure 2 show that the low-income groups experienced significant higher inflation than the high-income groups.

An in depth analysis of the contribution of each CPI-category to inflation (Figure 3) depicts that higher prices in the category Housing and Utility, Transportation along with elevated Food and Non Alcoholic beverage prices had a large contribution to the inflation of 2021 and 2022. However, price increases in Housing and Utility contributed more to inflation 2022 than in 2021. Because the lower-income groups spend more than 50% of their income on Housing and Utility and on Food and Non Alcoholic beverage, it is evident that these price shocks elevated inflation rates in the low-income groups in 2022 compared to 2021. The inflation experienced by the lowest income group (Quintile 1) in 2022 was 59.0%, which was 5.9pp higher than the highest income group (Quintile 5 inflation 2022: 53.1) and 6.6pp higher than the official published average inflation figure (52.4).

Figure 3: Headline Inflation by Category



Source: Author's compilation and General Bureau of Statistics, Suriname. Note: the figures of the CPI-categories are presented on the left hand y-axis. The published average inflation figures are presented on the right-hand y-axis.

Chapter 5: CONCLUSION AND RECOMMENDATIONS

This paper aimed to study the impact of inflation across social groups in Suriname for the period 2016-2022. In using data from the Survey of Living Conditions 2016/2017, the paper estimated the inflation rates across different income groups, which were divided into quintiles. The paper established that the gap between the published inflation and the inflation per income category and the inflation between the different income groups was on average lower during periods of relative low and stable inflation. Moreover, the paper found that even though income groups faced different inflation rates each year, the differences were not significant for the period 2017-2021. In line with previous studies, the study results points that higher food prices and utility prices will translate in to much higher inflation rates for low-income households than for high-income households. Overall, it can be concluded that each household experiences different inflation rates and that it has a direct impact on their consumption and therefore their cost-of-living, which is not fully represented by published inflation figures.

Based on the findings it is recommended that adequate monetary policy should be conducted by the Central Bank of Suriname to achieve their mean goal, which is price stability. When inflation is kept low and stable, this will be beneficial for both low-income and high-income groups. Since most of the food prices increases are largely driven by external price shocks and utility price increases are steaming from the shift to market-based prices, the government should but in place a social safety net to ensure that the lower-income groups are protected because they spend more than 50% of their income on food and utility.

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CERT Research Agenda 2022/2024
CERT Workstream 3 – Future Paths to Regional Resilience

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For more than a decade, the global economy enjoyed relatively calm periods of low and stable price levels, record low-interest rates (even negative rates existed) and stable trade and supply links with perceived little or no risk to output and operational resilience. Understandably, policy measures (monetary and fiscal), economic systems and business operations all adjusted to this new environment with the general understanding that it represents the new normal. The COVID-19 pandemic, Russia-Ukraine war and geopolitical tensions have considerably altered this environment and presented a much changed future outlook. Moreover, these events have not only exposed the frailty of the global trade and supply links but also highlighted the unintended risk they pose to price and output stability. Further, it is now fully understood and accepted by many that policy measures do not necessarily operate symmetrically that is, tools and instruments calibrated for low price, low volatility regimes may not function as effective for the high price, high volatility regimes.

The Region is facing daunting challenges accentuated by the fallouts from the pandemic, the Russian-Ukraine war and geopolitical tensions. These events have significantly altered the global economic and monetary landscapes. In fact, it is now widely accepted that global prices and interest rates may have to be settled at higher levels than existing targets in order to strike an appropriate balance between inflation and growth concerns, the probable legacy of the decade old ultra-low interest rate environment and the economic and policy disruptions caused by the pandemic and the Russia-Ukraine war. In addition, low carbon transitioning while likely to be a major economic challenge for the region because of countries' high climate exposure and limited financing capacity, is equally likely to provide opportunities to build a more resilient regional economy.

The work stream objective is to explore suitable policy solutions to the broad question of how the region can re-design or re-calibrate its policy framework and institutions to support the creation of a resilient economic system for sustainable growth in the context expected for future pandemics, possibly higher monetary rate and price levels and net zero transitioning. At a minimum, a resilient economic system should be taken to mean an economy with sufficient internal capacities (inclusive of support mechanisms) to absorb and contain acute macro-shocks and spillovers to acceptable tolerance levels and concomitantly, appropriately positioned to maximise the benefits from net zero transitioning.