THE ESCALATION IN WORLD FOOD PRICES AND ITS IMPLICATIONS FOR THE CARIBBEAN

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ABSTRACT

During the last years, the steep increase in food prices has been one of the most distinctive characteristics of the world economy. Many factors have been hypothesized as the main drivers of this phenomenon, both structural and temporary. International food inflation has had perceptible effects on food importing countries and regions. As such, the Caribbean has suffered the impact mainly through four channels, namely, domestic inflation, imports bill and trade balance, poverty and indigence rates, and equity. This study addresses empirically these issues from a regional perspective.

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Introduction

One of the major concerns in the world economy over the last few years is the escalation in food prices. This process started in mid-2006 when most food prices initiated a steep hike in international markets. As a consequence, prices of essential products have risen considerably, which has prompted negative impacts worldwide, such as the acceleration of inflation, the reduction of real consumption – especially of the poor – and the rise in inequality, among others.

Inflation is deemed to be the most regressive tax of all because the poor do not have any way of protecting themselves from it, whereas the rich can ameliorate its effects through the acquisition of financial assets that can be either indexed to inflation or be denominated in foreign currency.[1] But if inflation is regressive, it is even more detrimental to equity when it is led by food inflation. Indeed, the population of the lowest quintiles or deciles of the distribution of income is the one that devotes the highest share of their income to purchase food. Thus, the inflation of the poor is much higher than that of the rich.

For the Caribbean countries, the implications arising from the current global food crisis are far reaching. At the macroeconomic level, the impact will be felt through widening trade deficits for most countries as a result of higher food import bills, as well as increasing inflationary pressures. At the social level, real income and consumption capacity of most households and individuals will suffer accordingly, contributing directly to the increase in poverty and inequality. The negative impact of higher food prices could eventually translate into a severe step back in regional achievements of poverty reduction and social development goals. Actually, the World Bank and the Economic and Social Council (ECOSOC) of the United Nations have estimated that seven years of global advances in the fight against poverty have been already wiped out by the global food crisis, thus severely jeopardizing the achievement of the Millennium Development Goals (MDGs). Moreover, according to the Economic Commission for Latin America and the Caribbean (ECLAC) estimations, a 15% increase in food prices in 2008 relative to 2007 would push more than 200 million people into poverty and some 84 million people into indigence in Latin America and the Caribbean. This would mean an increase in both poverty and indigence rates of near three percentage points.

This report addresses this problem in the Caribbean countries. Section I describes the process of escalation in world food prices during the last years. The next section discusses the causes of these dynamics and evaluates econometrically the relevance of each factor deemed to lie behind this process. The third section then turns to the likely impact of the hike in food prices on the Caribbean, focusing on domestic inflation, trade balances, poverty rates and income distribution. The last section concludes.

I.   THE DYNAMICS OF WORLD FOOD PRICES IN RECENT YEARS

The rise in international prices of most food products is a major event with global implications. Figure 1 shows the evolution of the Food Price Index recorded by the Food and Agriculture Organization (FAO)[2]. As can be seen, this process intensified since mid-2006, when all indexes started increasing at significantly more rapid rates. Actually, between July 2006 and

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[1] Inflation is considered a tax in the sense that the government can finance part of their deficits through printing money. Revenue from printing money is referred to as seignorage.

[2] This index is composed by the weighted average of six commodity group price indexes (meat, dairy, cereals, oils and fats, and sugar), with weights given by the share of each group in total exports in 1998-2000.

June 2008, the general index increased by 72%. Adjusting for world inflation, the hike was to the tune of 62%. During this two-year period, inflation was more significant in oil and fats (150%), followed by cereals (121%) and dairy products (98%), whereas meat prices rose at a much lower but still significant rate of 18%, or 8% in real terms.

Figure 1: FAO Food Price Index, 2000-2008
(Base year 2000 = 100)
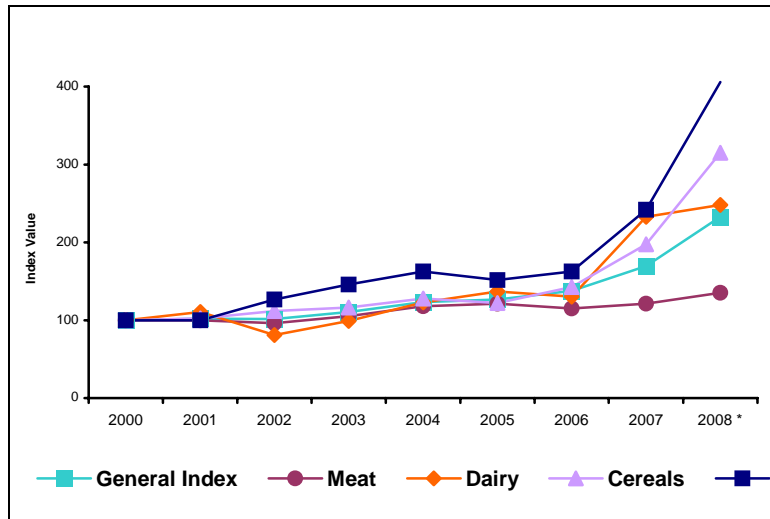
Source: FAO
* Data up to June 2006.

The magnitude of world food inflation is better realized when considering the evolution of prices of individual products. Figure 2 shows the average prices of key products in 2005 and in January-May 2008. Prices of all seven products considered more than doubled between the two periods. The increases range from 110% in soybean to 175% in palm oil. Prices of maize, rice and sorghum rose by near 130%, whereas those of wheat and soy oil surged by some 155%. In all cases, these levels of prices are historical records, not only in nominal but also in real terms.

Figure 2: International prices of selected products, 2005 and January-May 2008
(US$ per ton)
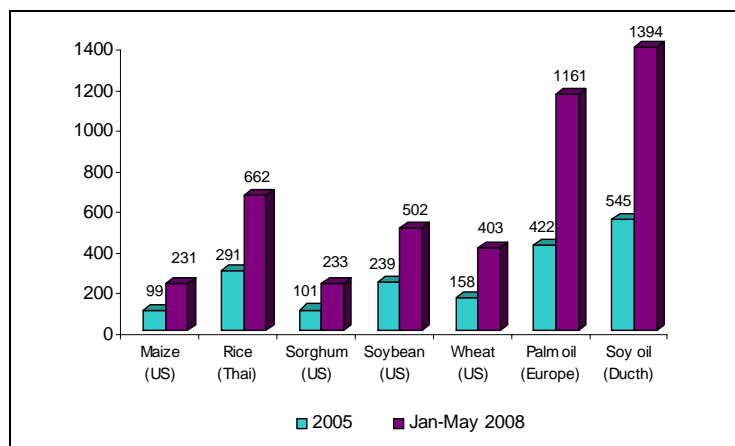
Source: FAO

On the other hand, not only are price increases harmful to the economy, but also their volatility, as uncertainty grows with its corresponding negative impact on investment and the efficiency in the allocation of resources. Measuring volatility by the coefficient of variation of prices, figure 3 compares those recorded between July 2004 and June 2006 and between July 2006 and June 2008 for selected products. It is quite clear that if the recent hike in food prices has been significant, then the surge in its volatility has been even more notorious. Indeed, while in the former period the maximum value of the coefficient of variation was 13.3% recoded by soybean meal, in the latter all values were above 24%, with a maximum as high as 51.4% recorded by rice.

Figure 3: Coefficient of variation of prices of selected products, Jul 2004-Jun 2006 and Jul 2006-Jun 2008
(Percentage)
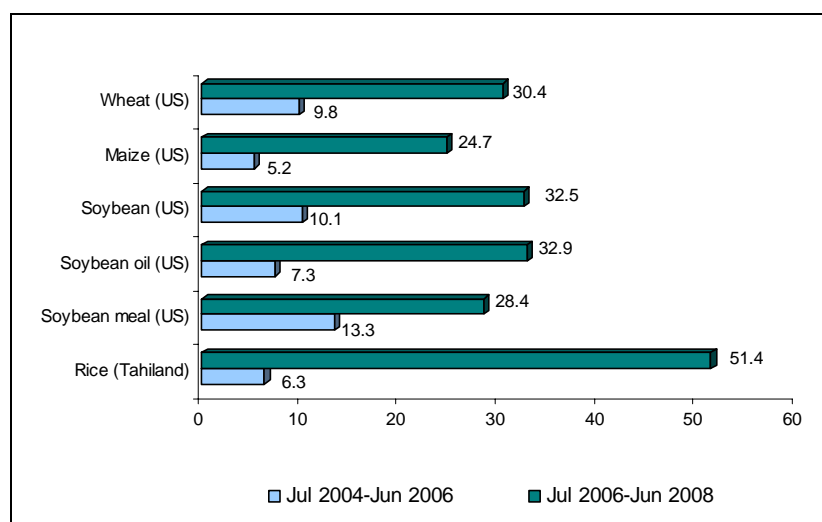
Source: ECLAC calculations on the basis of FAO data.

The situation described above present a gloomy panorama of a global scale. The first step to tackle it is to understand its causes. This is addressed in the next section.

II. CAUSES OF THE INCREASES IN FOOD PRICES

The increase in international food prices is evidently derived from a major imbalance between global supply and demand, which is explained by a combination of structural and temporary factors. Although the exact structure and relationship among the different forces fuelling this imbalance are complex and not still fully understood, it is widely recognized that there are a number of elements to consider. On the demand side, the factors most mentioned are the sustained rapid growth and changing consumption patterns in emerging economies (especially China and India), and speculative investment in agriculture commodities' future markets. On the supply side, increased production costs must be considered as the main factor contributing to rising food prices. In addition, negative shocks on food supply associated with natural phenomena are also part of the story. In the case of the surge in biofuel production, there is a demand side (direct) and a supply side (indirect) effect. Finally, another element to be taken into account is the depreciation of the United States dollar, although it cannot be classified as either a supply or demand factor in world food markets. Table 1 presents the different demand

and supply drivers of food inflation differentiating between structural and temporary factors. Each of them is then discussed below.

Table 1: Main drivers of food inflation

	Structural	Temporary
Supply side	• Increases in production costs • Surge in biofuel production (indirect effect)	• Poor harvest due to natural phenomena
Demand side	• Sustained rapid growth and changes in consumption patterns in some emerging countries • Surge in biofuel production (direct effect)	• Speculative investment in agriculture commodities future and options markets
Other		• Depreciation of the United States dollar

Source: ECLAC.

A. STRUCTURAL FACTORS

1. Increases in production costs

As is well known, oil prices have increased since early 2002. However, it was in mid-2003 that prices started climbing at an accelerated pace, a process that has continued despite the ups and downs recorded. As a result of this process, the price of crude oil (West Texas Intermediate) almost quintupled between January 2000 and May 2008, going from US$27.3 to US$125.4 per barrel as shown in figure 4. This has led to a debate on the possibility that the world has reached the so-called "peak oil", i.e. the point in time when worldwide oil production reaches its highest level and, subsequently, starts going downhill. The implication of this scenario is that oil prices would keep going up as a response to the growing scarcity of this resource. Notwithstanding, it is worth noting that there are several factors that could ameliorate or delay the peak oil phenomenon: discovery of new reserves associated with new technologies, more efficient use, development of alternative energy sources, changes in consumption patterns, and a global financial crisis and recession. In any case, it is widely recognized that the cheap oil period is over so that during the next years although oil prices could decline, they will still remain at much higher levels than at the beginning of the current decade. Thus, the rise in oil prices constitutes a negative supply shock of a structural nature on world food markets.

Figure 4: Oil prices, January 2000-May 2008
(US$ per barrel)
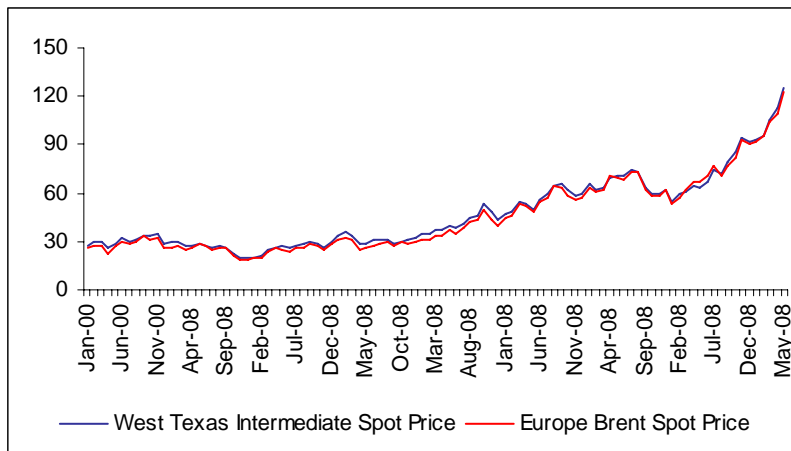
By the same token, the accelerated rise in fertilizers prices, from mid 2006 onwards, has also played a key role in expanding production costs of agriculture activities. Figure 5 shows that between the third quarter of 2003 and the first of 2008 phosphate rock prices have multiplied by a factor higher than 5, whereas those of diammonium phosphate and triple superphospate have done so by a factor of 3.8.

Figure 5: Fertilizers prices, 2003/III-2008/I
(US$ per ton; quarterly average)
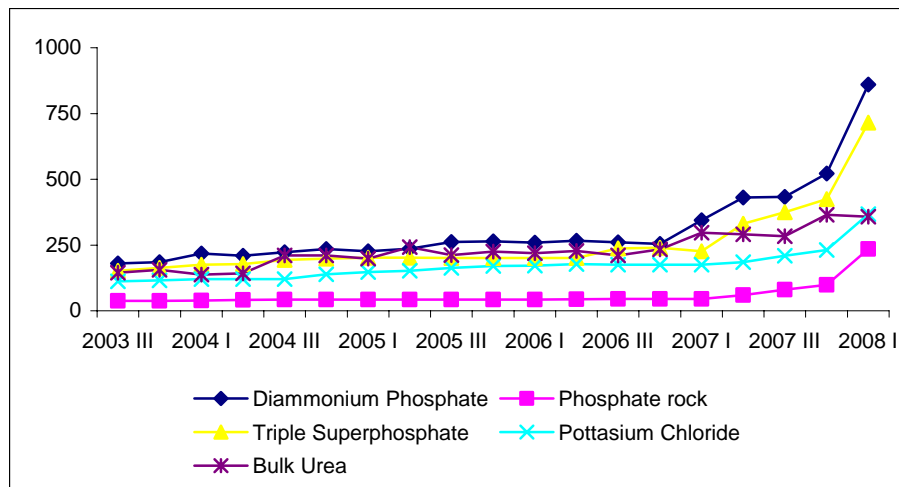
This evolution has had a significant impact on the production costs of food, inasmuch as modern agriculture, particularly in developed countries, is intensive in natural and artificial fertilizers. As in the case of oil, and despite some likely decline in the coming months, the prices of fertilizers would remain much higher than in the first half of the decade, therefore also representing a structural negative supply shock in food production that has put upward pressure on prices.

2. Surge in biofuel production

The generation of fuel from biological sources, including agricultural products like corn, sorghum and sugar cane, has been an ongoing industry for many decades. However, in recent years this activity has gained momentum as a consequence of rising international oil prices, which has made biofuel production profitable.

The United States is the leading country in this field, mainly due to the application of specific policies aimed at promoting biofuel generation and consumption[3]. As a result, the production of biofuel in this country has risen dramatically, quadrupling its output between 2000 and 2007. In 2007, the United States was responsible for 50% of the global ethanol production (see figure 6), with some 139 bio-refineries with an accumulated annual production capacity of 8 billion gallons. It is expected that at the end of 2008 such capacity will be expanded to 13 billion gallons per year.

Figure 6: World ethanol production, 2007
(Percentage)
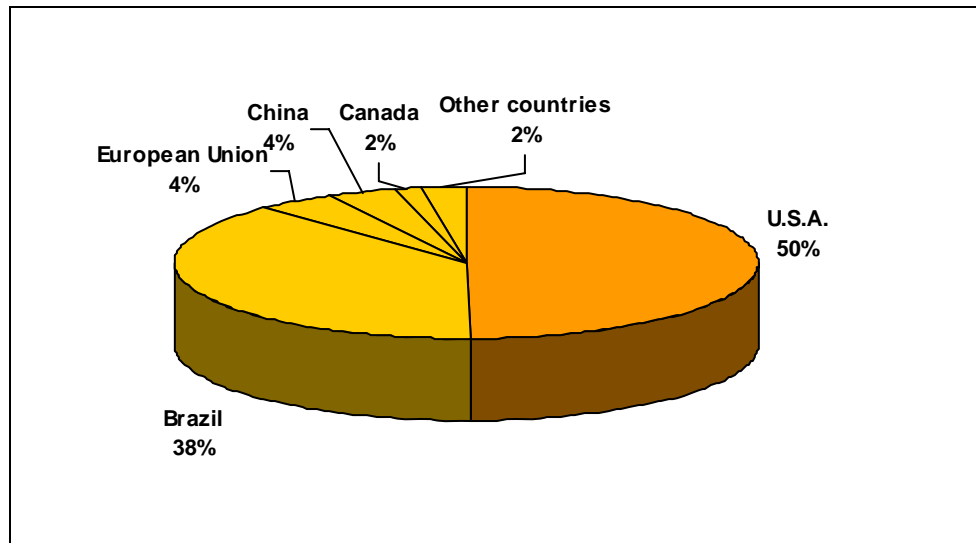
Source: United States Department of Agriculture, Renewable Fuel Association.

How does the boom in biofuel production affect international food prices? There is one direct and one indirect effect. The former arises from the fact that biofuel produced and consumed in the United States is ethanol, which is distilled from corn. In order to sustain the expansion in ethanol production recorded during recent years, the demand for corn has grown accordingly, which means that a bigger chunk of this country's corn production is being absorbed by the biofuel industry, instead of being devoted to human consumption and cattle feeding. Indeed, as figure 7 shows, the share of total corn production in the United States that is consumed by the biofuel industry has grown from 9.3% in 2002 to 24.7% in 2007. This direct effect is a demand side one.

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[3] In December 2007, the President of the United States signed into law the Energy Independence and Security Act (EISA), expanding the Renewable Fuels Standard (RFS). The expanded RFS has established as a main goal the use of 36 billion gallons of renewable fuels annually by 2022.

Figure 7: Corn used in ethanol production in the United States, 2002-2007
(Percentage of total corn production)
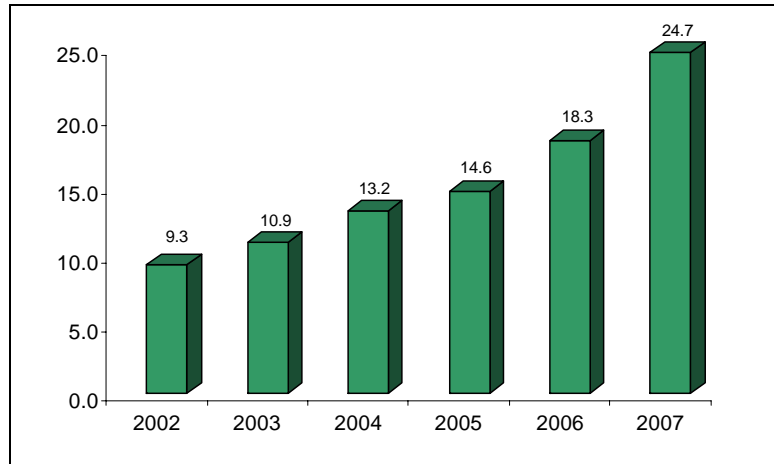
Source: United States Department of Agriculture, National Corn Growers Association.

However, there is also an indirect impact from this phenomenon affecting other staples not directly related to biofuel production. As corn prices go up, its production becomes more attractive, so that more resources are gradually allocated to the production of this crop. This process constrains the availability of resources (land, water, etc.) for other agricultural products, reducing their supply and, consequently, fuelling increases in their prices. Thus, the indirect effect of the increase in biofuel production is a supply side one. As it is expected that biofuel production will continue to expand, this phenomenon is of a structural nature.

3. Sustained rapid growth and change in consumption patterns in emerging countries

The accelerated growth in emerging economies and changes in their consumption patterns during recent years – notably China and India – is deemed to be one of the main structural factors behind the world food inflationary spiral. The argument is that the sustained and significant economic expansion of these countries has translated into higher per capita income and consumption and, consequently, in higher demand for traditional and new goods of either a better quality or a different nature. The rise of income has led more people to improve their consumption basket, including items previously absent or marginally present – notably meat and dairy products – therefore pushing up the demand for such goods at the global level, given the immense populations in these rapid growing emerging countries.[4]

Meat is a clearer example of greater demand from emerging countries that has fuelled world food inflation during recent years. As a source of calories and nutrients for humans, meat is an expensive item as compared to alternative sources like vegetable products, because its production requires a considerable supply of essential resources and inputs like water, fuel, grains and forage. It is estimated that the production of 1 kilogram of animal protein requires on average 6 kilograms of vegetable protein (grains and forage crops),[5] while similar patterns are found in water and energy consumption for livestock production. Under those parameters, increased meat consumption – particularly in China – would drive international prices up, not

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[4] From a world population of some 6.5 billion, one fifth is from China (1.3 billion), and 17% is from India (1.1 billion).
[5] The ratio is 1 to 8 in the case of beef and 1 to 2 in the case of poultry.

just of those of meat itself (beef, pork, poultry), but also of inputs for meat production, including grains and forage crops to feed livestock (corn, soybean meat).

The flip side of sustained economic growth recorded by China during recent decades is better standards of living and higher consumption levels. Indeed, per capita meat consumption has been increasing steadily in urban and rural areas alike, as shown in figure 8. In the former, between 1981 and 2006 annual meat consumption (including beef, mutton, pork and poultry) rose from 20.5 to 32.1 kilograms per head, a 57% increase. This process was more pronounced in the rural areas, where meat per capita consumption went from 9.4 to 20.5 kilograms, a 118% increment during the same period.

Figure 8: China: Per capita meat consumption, 1981-2006
(Kilograms)
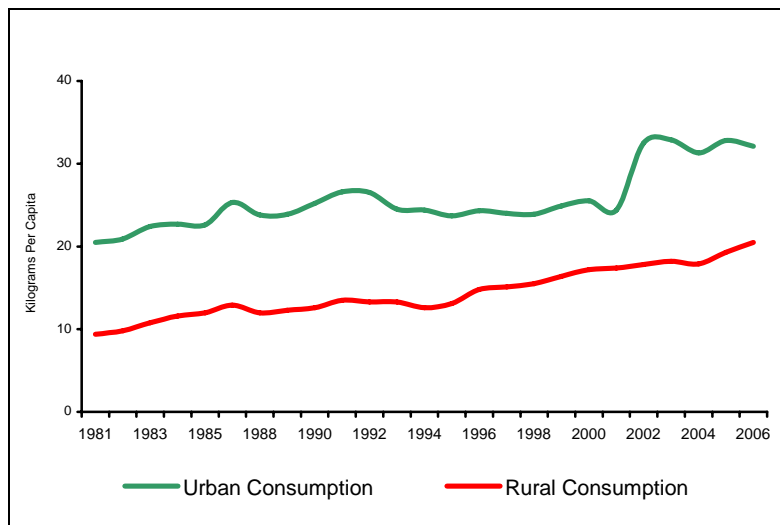
Source: United States Department of Agriculture.

Consequently, China's meat production and imports have been growing steadily in order to meet expanding domestic demand. According to FAO estimates, from 2004 to 2008 China's share of worldwide meat imports would increase from 7.8% to 12.4%, a remarkable expansion. However, the impact of China's meat demand has been concentrated on poultry rather than on other meats like bovine and pork. Indeed, poultry is not just the main type of meat imported by China, with a forecasted level of 2 million tonnes in 2008 (figure 9); it also exhibits the most dynamic growth that would double imported volume between 2005 and 2008.

Figure 9: China: Meat imports, 2005-2008
(Thousands of tonnes)
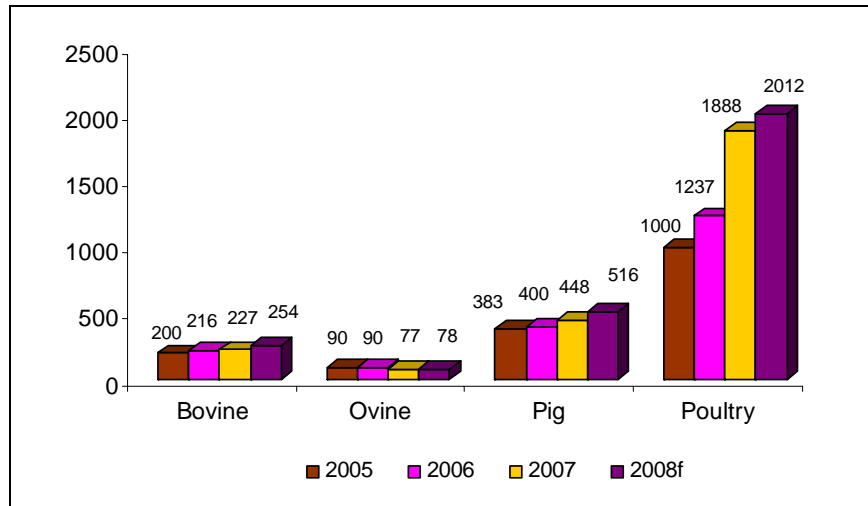
Source: FAO.
f = forecast.

Despite these changes in consumption patterns in China and their impact on international food prices, it is worth mentioning that China's economic boom and increase in consumption (including meat) did not happen overnight, but it was a gradual process dating back to the 1980s and 1990s. For many years China posted high growth rates and rising consumption without unleashing a general and massive rise of international food prices such as the one observed from mid-2006. By the same token, in some key staples such as wheat and rice, China has been a net exporter at the time when their international prices increased acutely. In the case of wheat, for instance, figure 10 shows that although during the 2004/2005 season (July/June) China imported a record 8.1 million tonnes, from the 2006/2007 season onwards China has been a net exporter of wheat.

Figure 10: China: Wheat trade, 2001-2009
(Millions of tonnes)
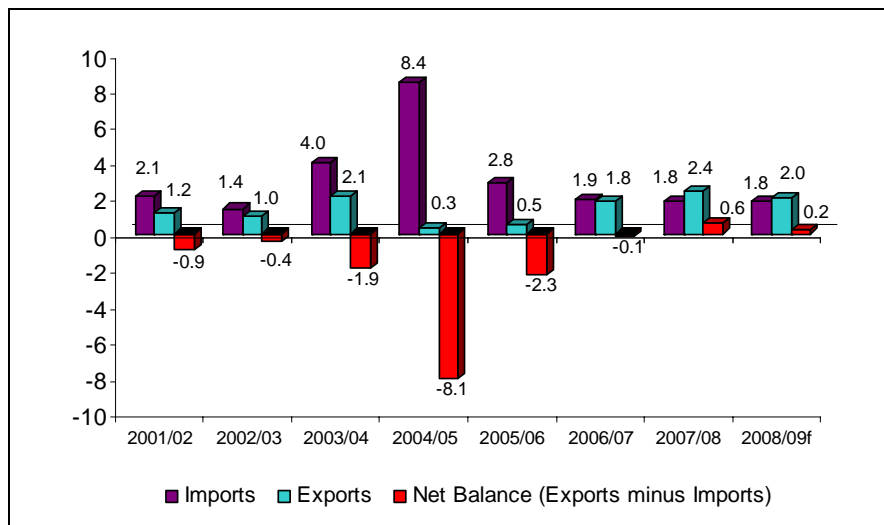
Source: FAO.

The corollary of the above discussion is that figures do not clearly support the hypothesis that Chinese consumption dynamics is at the heart of the current hike in food prices. On the one hand, China has been either a marginal importer or exporter of key grains like wheat during recent seasons when international food prices took off. On the other hand, and perhaps more importantly, the increment in meat imports by China is concentrated on poultry whose production is much less intense in grains than that of other meat products such as beef and pork. Indeed, while the share of China in global poultry imports went from 12.3% to 21.1% during 2004-2008 (a 73% increase), its share in world beef imports just increased from 3.1% to 3.5% (a 13% expansion), whereas that in world pork imports climbed from 8.1% to 10% (a 23% hike).

B. TEMPORARY FACTORS

1. Poor harvest due to natural phenomena

The world has witnessed a number of adverse events in some major agriculture producers during the last seasons that have had a direct impact on international food prices through the reduction in international supplies and stocks, especially in the case of wheat. According to the U.S. Department of Agriculture, between the 2004/2005 and the 2007/2008 season wheat production decreased in several key countries and regions, as shown in figure 11.

Figure 11: Wheat production index
(2004/2005 season = 100)
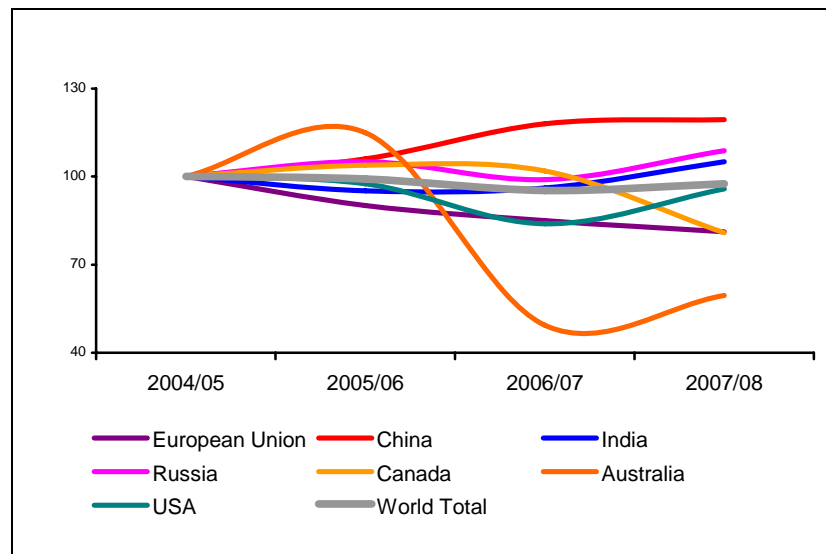
Source: United States Department of Agriculture.

The decline in wheat production was especially intense during the 2006/2007 season, due to a severe drought that affected Australia, whose wheat output dipped by 57% as compared to the previous season, from 25.2 million to 10.8 million of metric tones (figure 12). As this country is an important exporter of wheat, this event significantly affected international wheat supply and stocks and therefore put upward pressure on world wheat prices[6]. It is worth noting that poor harvest in one particular season does not only impact current world prices but also during the

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[6] During the 2005/2006 season, Australian wheat exports accounted for 13.7% of the world total, declining to 10% in 2006/2007 and further to 6.8% in 2007/2008. During 2008/2009 it is expected that their share will return to the levels recorded in 2005/2006.

following years through the effect on world stocks. Thus, despite the mild recovery of world wheat production during the 2007/2008 campaign and the optimistic perspectives for the 2008/2009 season, the impact on wheat prices associated with the 2007 drought in Australia is probably not going to disappear quickly, so that price volatility and inflationary pressures on the world wheat market is expected to continue during 2009.

Figure 12: Australia: Wheat production, 2004/2005-2007/2008
(Millions of metric tons)
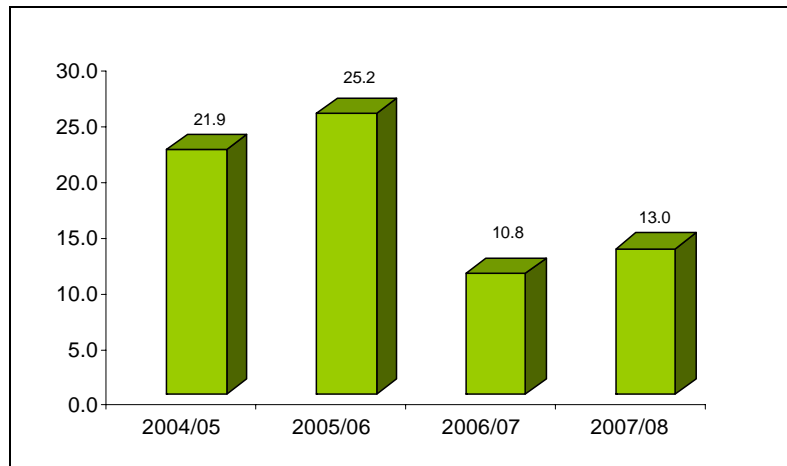
Source: United States Department of Agriculture.

Although the current upward pressure on worldwide wheat prices is partly explained by reduced production in some big countries, namely Australia, due to natural phenomena, other events, whose occurrence has affected or is still affecting food prices either at the international or at the domestic level must be mentioned. Desertification and land degradation, heavy rains and floods, water pollution, and so on, are some examples of those phenomenon affecting regional or country agriculture output. In the case of the Caribbean, Hurricane Dean that hit the region in August 2007 did affect foodstuff production in several countries reducing their output of agriculture goods both for export and for domestic consumption[7].

2. Speculative investment in agricultural commodities' future and options markets

Another temporary factor that lies behind the current hike in food prices is the emergence and increasing participation of investment banks and other institutional investors in world commodity markets. In the wake of the collapse of real estate markets and low interest rates, particularly in the United States, these institutions are targeting food products and other commodities as investment vehicles. As a result, international investment in financial instruments linked to food stocks have soared in the last few years.[8]

Figure 13 shows that since 2003 demand for commodity futures have surged for the most important grains for human consumption. In March 2008, the stockpile on corn futures was some

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[7] For assessments on the damage and losses caused by Hurricane Dean in Saint Lucia, Dominica and Belize see ECLAC and UNDP (2007a), (2007b) and (2007c), respectively. In the case of Jamaica, see Planning Institute of Jamaica (2007).
[8] According to the Latin American and Caribbean Economic System (SELA) and the Bank for International Settlements (BIS), between 2004 and 2007 financial investment in commodities like food and oil multiplied by a factor of 8 totalling some US$ 8,400 billion at the end of 2007.

2,381 million bushels, an amount equivalent to the full annual corn supply to the ethanol industry. Moreover, between January 2003 and March 2008 the stockpile of corn futures multiplied by a factor of almost 10. By the same token, soybean and wheat futures also dramatically increased their futures market stockpiles multiplying by a factor of 12 and 7, respectively.

Figure 13: Stockpiles of future markets, January 2003 and March 2008
(Millions of bushels)
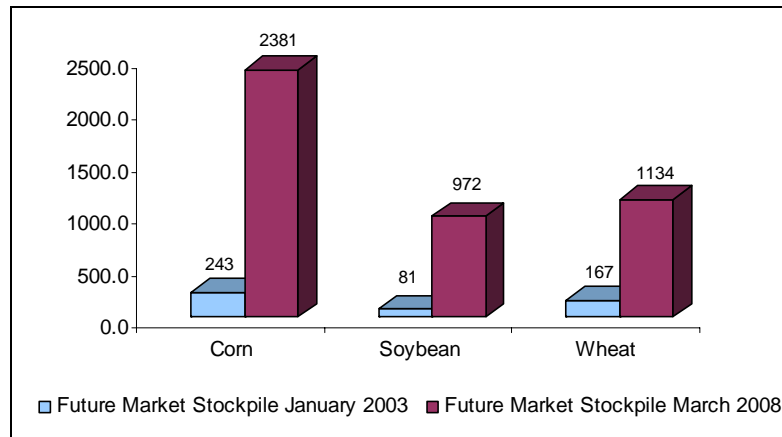
Source: Masters Capital Management LLC.

The considerable expansion of investment in foodstuff futures, especially in essential products like corn and wheat, has fostered the inflationary pressures on international food markets. Because future prices act as a benchmark for the current prices of commodities, increments in the former translates into higher spot prices through economic agents' expectations. Therefore, speculative investment should be considered as one of the main temporary factors adding to inflation in international food markets.

3. Depreciation of the United States dollar

Another temporary factor deemed to be partly responsible for the surge of world food prices is the depreciating tendency showed by the United States dollar. As international commodity prices are denominated in this currency, the loss of value of the currency has pushed these prices upwards to recover their level in terms of other currencies, particularly the Euro.

The roots of the depreciating dollar are in the substantive twin deficits recorded since the beginning of the present decade due to a combination of tax cuts and public spending expansion, associated with the September 11th terrorist attacks in 2001 and the subsequent invasions of Afghanistan and Iraq, together with a private credit and consumption boom that fuelled and was fed by the real estate bubble.[9] The excess of public and private spending over income needed to be financed by the rest of the world. Thus, the United States Government issued large amounts of Treasury Bills to finance the fiscal deficit therefore expanding the supply of dollar denominated assets. Private excess of expenditure was financed by foreign capital inflows to domestic financial institutions and stock markets. Particularly important was the role of some Central Banks that accumulated massive amounts of Treasury Bills as international reserves. But as these were increasingly denominated in United States currency, they started to lose appetite for such

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[9] Fiscal balance went from a surplus of 2.6% of GDP in 2000 to a deficit of 2.1% of GDP in 2002.

assets denominated in dollars, therefore reducing their demand for such financial instruments and putting downward pressures on the value of the greenback.

Figure 14 shows the exchange rate of the United States dollar vis-à-vis the Euro and the Chinese currency in January 2005-June 2008[10]. After reaching its highest value in late 2005 (US$1.18 per Euro), the United States currency started to depreciate and reached its minimum by mid-2008 (US$1.58 per Euro). Since January 2006, the United States dollar lost one third of its value with respect to the Euro. The process was similar but less intense in the case of the Yuan. After moving from the peg of Y$8.28 per United States dollar to a peg based on a basket of currencies in July 2005, the Chinese currency has appreciated vis-à-vis the greenback. In June 2008, the exchange rate was Y$ 6.9 per United States dollar, which means a 16.7% nominal depreciation of the United States dollar.

Figure 14: United States dollar nominal exchange rate, Jan 2005-Jun 2008
(US$ per Euro and Yuans per US$)
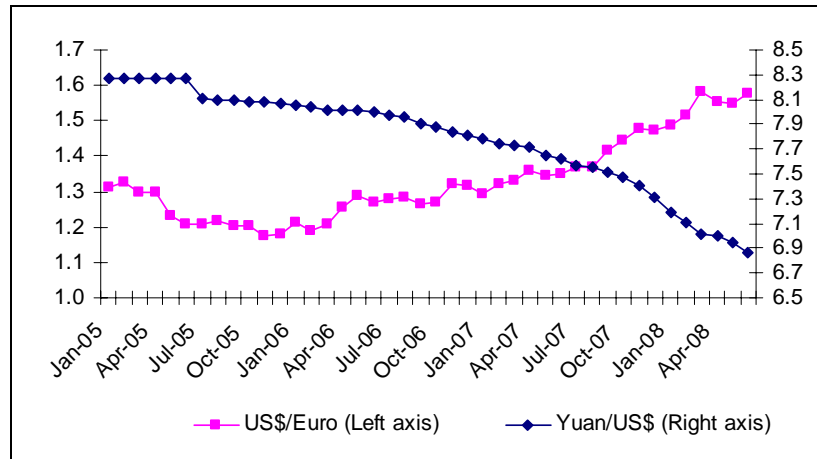
Source: International Monetary Fund, International Financial Statistics, electronic version.

C. EXPLORING THE VALIDITY OF THE EXPLANATIONS FOR THE ACCELERATION OF FOOD INFLATION

The various explanations of the increase in food prices discussed above are tested econometrically in this subsection. The model formulated postulates that food inflation (π) depends on its own past value (π_{-1}) to capture inflationary inertia, input costs increases, excess of demand and expectations, such that:

$$\pi = \alpha + \beta\pi_{-1} + \sum_{i=1}^{I} \gamma_i X_i + \sum_{j=1}^{J} \delta_j Y_j + \sum_{k=1}^{K} \theta_k Z_k + \sum_{r=1}^{R} \rho_r D_r + \sum_{m=2}^{12} \lambda_m S_m + \phi US\$ + \varepsilon \qquad (1)$$

where π is food inflation, the X's are a set of variables that reflect the increase in food production costs such as the growth rate of oil and fertilizers prices. The Y's are a set of variables that captures excess of demand proxied by imports growth rates in China and India; as well as biofuel production in the United States. The Z's are expectations variables proxied by purchases of food commodities in future and options markets. The D's are dummy variables that capture natural

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[10] Note that the exchange rate of the European currency is expressed as dollars per Euro whereas that of the Chinese currency is expressed as Yuans per dollar.

phenomena that affected food supply. The *S*'s are monthly seasonal dummies, whereas US$ is the nominal depreciation of the United States dollar vis-à-vis the Euro. The model is estimated using monthly data between February 2000 and June 2008. The results for the best specification of the model are shown in table 2. Of course, these results are only exploratory and are intended to provide a very preliminary evaluation of the causes of the acceleration of world food inflation so as to have an idea of whether this process is mainly driven by temporary factors or if it is of a more structural nature. Definitions of variables and sources are in Annex I.

Table 2: Drivers of world food inflation
(Estimation method: Ordinary Least Squares; sample: February 2000-June 2008)

Explanatory variable	Coefficient	t-statistic	p-value
Constant	-0.011	-1.20	0.24
π_{-1}	0.360	3.41	0.00
CHINAMV$_{-1}$	0.048	1.67	0.10
USETH	0.130	1.92	0.06
FUTOPT	0.042	2.88	0.00
US$	0.190	1.89	0.06

R^2 = 0.47
F (16,60) = 3.34 (p-value = 0.00)
Number of observations = 77
Number of parameters = 17

AR 1-2 test: **F(2,58) = 0.11 (p-value = 0.90)**
Heteroscedasticity test: Chi^2 = 0.37 (p-value = 0.99)
Normality test: **Chi^2 = 0.86 (p-value = 0.65)**
RESET test: **F(1,59) = 1.50 (p-value = 0.23)**

Source: ECLAC calculations.
Note: Estimation including seasonal dummies;
       CHINAMV$_{-1}$ = imports volumes of China lagged one month;
       USETH = ethanol production in the United States;
       FUTOPT = increase in contracts of futures and options of food products.

Results indicate that the structural factors that have influenced world food inflation in the analyzed period are imports from China (lagged one period) and the production of ethanol in the United States. Surprisingly, evidence of a significant effect from either oil or fertilizer prices increases could not be found. Regarding temporary factors, the main ones seem to be (speculative) investment in futures and options in food markets and the depreciation of the greenback against the Euro. Therefore, these preliminary findings indicate that the current surge in world food prices is driven by a combination of structural and temporary factors. The former are excess on demand ones, namely Chinese imports growth and biofuel production, whereas the latter are expectations as measured by investment in food products in futures and options markets, and the depreciation of the United States dollar. Statistical tests reveal that there is no evidence of autocorrelation, heteroscedasticity or non-normality in the residuals that could have rendered inefficient the estimates and lead to overstating the statistical significance of the parameters. In addition, there does not seem to be functional form misspecification. Thus, although exploratory, the results seem reliable. Overall, the estimated model explains 47% of the variations in world food inflation, representing an acceptable goodness of fit.

III.   EFFECTS ON THE CARIBBEAN

The most obvious direct effect of the increase in international food prices is on domestic inflation rates given the importance of (mostly imported) food in the consumption basket used to measure the Consumer Price Index (CPI) in all countries. Second, as the Caribbean is a net importer of food, the impact on the import bill and on trade balances should also be taken into account. On the social front, the implications of the rise in food prices on poverty and indigence rates and on income distribution are also presumably high. Unfortunately, in the absence of access to detailed information from household surveys at the microeconomic level, a discussion is presented below based on macroeconomic and aggregate household surveys information.[11]

These effects are evaluated below addressing the likely impact of a 40% increase in world food prices in 2008. This rate may seem too high, but this is not the case, as to June 2008 (the latest figure available) world food inflation posted a rate near 45%. This analysis is preceded by a brief discussion on the dependency of Caribbean countries on imported food and some considerations on nutrition, key variables for the understanding of the region's vulnerability to the escalation of food prices in international markets.

A. CARIBBEAN DEPENDENCY ON IMPORTED FOOD AND NUTRITION CONSIDERATIONS

The effect of world food inflation on Caribbean countries is basically determined by their dependency on imported foodstuffs. It is well known that the region is a net importer of food, with only Guyana and Suriname being exporters of a product – i.e. rice – whose international price has risen significantly during recent years. Other agricultural products are also important in the export baskets of some Caribbean countries such as Barbados, Belize, Guyana and Jamaica in the case of sugar, and Belize, Suriname, Dominica, Saint Lucia and St. Vincent and the Grenadines in the case of banana and plantain. Notwithstanding, none of these products have witnessed a comparable hike in their prices in world markets.[12]

Figure 15 shows that the Caribbean is a net importer of most basic grains and pulses, including the ones that have experienced significant price increases such as maize, rice and, especially wheat. Indeed, from April 2007 to April 2008 the consumption of corn, rice and coarse grains in the Caribbean countries was 4.2, 2.5 and 3.7 times higher than domestic production, respectively. The difference, of course, needed to be imported. This chronic imbalance between regional demand for and supply of most basic food products is particularly evident in the case of wheat, a crop that does not grow in the Caribbean, but is widely consumed by the population in the form of breads and crackers, pasta and semolina, flour, and so on. Indeed, during the same period, regional wheat imports totalled 1,795 thousand metric tons. This high dependence on imports of wheat and other basic grains reveals that the Caribbean region is highly vulnerable to the escalation in world food prices thus raising the issue of food security.

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[11] For the type of analysis that can be carried out with microeconomic survey data see Dessus *et al* (2008) and IDB (2008).

[12] Indeed, Caribbean sugar world prices went from US$15.86 per pound in July 2006 to US$12.88 in March 2008, a 19% dip.

**Figure 15: Caribbean domestic production, consumption and imports of grains and pulses,
April 2007-April 2008**
(Thousands of metric tons)
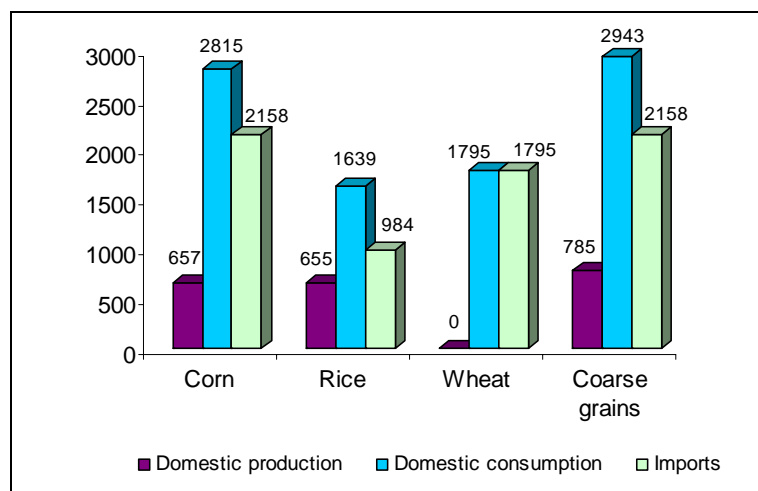
Source: United States Department of Agriculture.

On the other hand, in recent decades the Caribbean has made significant improvements in food availability and consumption, which have favourably impacted nutrition indicators. For instance, according to the Caribbean Food and Nutrition Institute (CFNI) (2007), malnutrition rates (weight for age) in children below five years of age more than halved between 1994-1996 and 2000-2003 in Guyana (from 19% to 9.4%) and Belize (from 15% to 7.3%). By the same token, FAO (2006) estimates that between 1979 -1981 and 2001-2003, the daily average calorie intake per person increased in all More Developed Countries (MDCs), except for Trinidad and Tobago.[13] In the latter period, this figure ranged from 2,660 in Suriname (2,400 in 1979-1981) to 3,110 in Barbados (3,040 in 1979-1981). It is worth noting that in all cases, daily average per capita intake of calories in 2001-2003 was above the 2,400 level estimated by the CFNI as the minimum requirement for adults to meet their nutritional needs. This basic nutritional requirement is extensively used in household surveys and poverty assessments throughout the region as the benchmark to determine indigence lines.

Despite these positive trends, ECLAC (2006) raises a particularly worrisome issue, namely, that changes in consumption patterns in the Caribbean have increased dependency on imported food as a result of the substitution of the traditional diet based on domestic produce for a diet more intensive in cereals like wheat and other staples mostly produced outside the region. This reinforces the vulnerability of the Caribbean to the escalation in world food prices.

B. DOMESTIC INFLATION

In order to realize the impact of food price increases on inflation, figure 16a presents cumulative inflation rates recorded by the MDCs between July 2006, when world food prices started to escalate as discussed above, and June 2008.[14] It is clear that food inflation surpassed headline inflation, i.e. Consumer Price Index (CPI) inflation, in all cases so that it played a key role in the acceleration of inflation during this period. By far, the most significant difference was

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[13] This source does not provide information for the ECCU countries.
[14] Bahamas, Barbados, Belize, Guyana, Jamaica, Suriname and Trinidad and Tobago.

in Trinidad and Tobago, (21.7 percentage points) where food inflation reached 41.2%, almost four times the rate posted by non-food inflation (11.2%), and more than doubling that of headline inflation (19.5%). In Guyana, Jamaica and Suriname, the difference between food and headline inflation was 11-13 percentage points. In the other MDCs, the difference was lower, particularly in the Bahamas, where it was 2.6 percentage points. In this grouping of countries, the ratio of food inflation to non-food inflation ranged from 1.4 in Bahamas to 4.1 in Belize.

Figure 16a: Headline, food and non-food cumulative inflation, July 2006-June 2008
(Percentage)
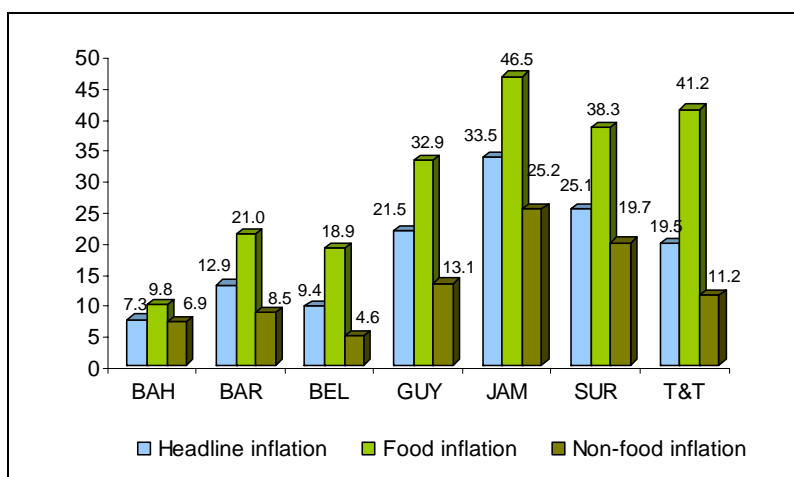
Source: ECLAC based on official information.

As shown in figure 16b, in the Eastern Caribbean Currency Union (ECCU) countries, the difference between food and headline inflation between July 2006 and March 2008 was more significant in Grenada (8.6 percentage points) followed by Dominica (8.3). In these countries food inflation exceeded non-food inflation by a factor of 2.7 and 3.3, respectively. The difference was also significant in Montserrat, where food inflation posted a rate 2.8 times that of non-food inflation, and St. Vincent and the Grenadines, where this factor was 2.3. On the contrary, Saint Lucia exhibited the most even inflation rates, with a difference lower than 2 percentage points between food (11%) and non-food inflation (9.2%). The other countries were in an intermediate situation.

Figure 16b: Headline, food and non-food cumulative inflation, July 2006-June 2008
(Percentage)
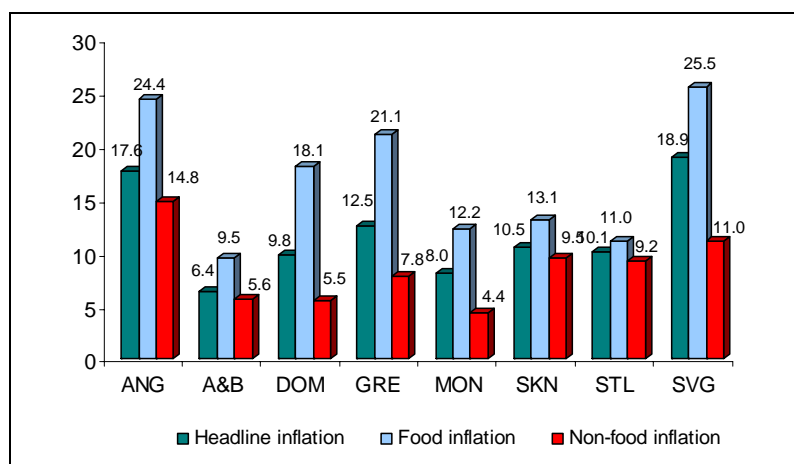
Source: ECLAC based on official information.

In general, food inflation was more acute in the MDCs as compared to the ECCU countries. In the former group of countries, more than half posted food inflation rates above 25% whereas in the latter the maximum rate was recorded by St. Vincent and the Grenadines (25.5%). This may seem surprising, inasmuch as ECCU countries are more dependent on food imports than the MDCs. Thus, the explanation for this behaviour must lie on more successful anti-inflationary policies implemented by the ECCU countries. As smaller economies tend to be more open than larger ones, the size of ECCU countries could have provided stronger incentives to their authorities for a more prudent conduct of monetary policy, given that openness reduces the effect of money growth on domestic output.[15]

The better inflation performance in ECCU countries as compared to MDCs is clearly shown in figure 17 where Jamaica, Guyana, Suriname and Trinidad and Tobago exceeded both food and non-food regional inflation (simple average) between July 2006 and June 2008, in some cases by a large amount. On the contrary, most ECCU countries posted food inflation rates lower than the regional average (22.9%), whereas only two (Anguilla and St. Vincent and the Grenadines) exhibited food and non-food inflation rates higher than the regional simple average (10.4% in the latter case).

Figure 17: Food and non-food inflation, July 2006-June 2008
(Percentage)
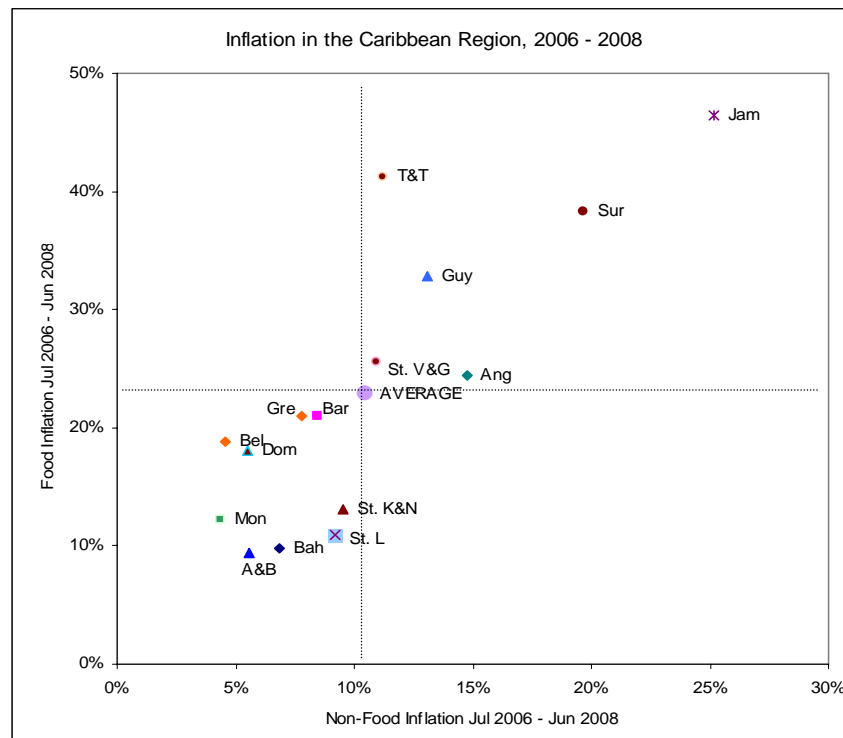
Source: Figures 15a and 15b.

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[15] IMF (2006) found that – after controlling for fiscal balance, inflation in advanced economies, depth of financial sector, central bank independence and exchange rate regime – an emerging country whose trade-to-GDP ratio is 25 percentage points higher than in another country is over 10 percentage points more likely to exhibit single-digit inflation rates.

Table 3 shows the contribution of food inflation to headline inflation in July 2006-March 2008. In percentage points of headline inflation, the highest impact of food inflation was recorded by Jamaica (14.6 percentage points), Guyana (13.8), St. Vincent and the Grenadines (10), Trinidad and Tobago (9) and Suriname (7.6). On the contrary, the lowest effect was felt in the Bahamas (1.1 percentage points) followed by Antigua and Barbuda (2.1). Looking at the contribution of food inflation to overall inflation, in most countries the former accounted for more than half of the latter. The exceptions were Bahamas (27.1% of contribution), Suriname (46.9%), Anguilla (41.8%) and Antigua and Barbuda (39.2%). In Barbados, Belize, Guyana, Dominica, Montserrat, St. Kitts and Nevis, Saint Lucia, and St. Vincent and the Grenadines, food inflation accounted for between two thirds and three quarters of headline inflation in July 2006-March 2008.

Table 3: Contribution of food inflation to headline inflation, July 2006-March 2008
(Percentage points and percentage)

	Percentage points	Percentage
MDCs		
Bahamas	1.1	27.1
Barbados	4.8	67.2
Belize	4.8	76.6
Guyana	13.8	67.4
Jamaica	14.6	56.2
Suriname	7.6	46.9
Trinidad and Tobago	9.0	58.3
ECCU		
Anguilla	5.1	41.8
Antigua and Barbuda	2.1	39.2
Dominica	5.9	77.3
Grenada	5.6	59.0
Montserrat	4.0	79.6
St. Kitts and Nevis	6.8	72.7
St. Lucia	6.6	68.4
St. Vincent and the Grenadines	10.0	71.2

Source: ECLAC's calculations based on official data.

In order to estimate the impact of world food inflation on domestic headline inflation two transmission mechanisms are needed to be addressed. First, the pass-through effect of international food price increases on domestic food inflation. In general, the higher the dependence of a country on imported food, the higher the pass-through coefficient. In addition, this transmission channel is highly sensitive to a number of economic policy tools such as price controls, subsidies, exchange rate management and import tariffs. A precise estimation of pass-through coefficients demands a specific econometric study per country on its own right and requires analysis by product rather than at the aggregate food category. As such, it is beyond the scope of this report. Therefore, the simplest (and roughest) approximation to pass-through coefficients is used, i.e. calculating them by simply dividing domestic food inflation by world food inflation in a given period. The second transmission mechanism is the effect of domestic food inflation on headline inflation, which is determined by the weight of foodstuff price increases in CPI inflation in each country. Transmission coefficients are presented in table 4 calculated using July 2006-March 2008 monthly data.

Table 4: Pass-through coefficient and food inflation weight on CPI inflation, July 2006-March 2008
(Percentage)

	Pass-trough coefficient[a]	Domestic food inflation weight on CPI inflation[b]
MDCs		
Bahamas	15.5	14.6
Barbados	27.4	36.1
Belice	28.4	34.2
Guyana	65.8	42.7
Jamaica	76.2	39.0
Suriname	53.7	28.9
Trinidad and Tobago	66.0	27.8
ECCU		
Anguilla	34.1	30.3
Antigua and Barbuda	19.8	21.8
Dominica	35.7	33.6
Grenada	31.7	36.2
Montserrat	17.6	46.3
St. Kitts and Nevis	21.9	63.9
St. Lucia	28.2	48.1
St. Vincent and the Grenadines	37.4	54.8

Source: ECLAC calculations on the basis of official data.
[a] Percentage of cumulative world food inflation transmitted to cumulative domestic food inflation calculated dividing the latter by the former.
[b] This is calculated as α from the equation $\pi^{HEADLINE} = \alpha\pi^{FOOD} + (1-\alpha)\pi^{NON-FOOD}$, where the superscripts indicate the type of inflation.

As shown, within the MDCs, the highest values of pass-through coefficients are those of Jamaica (76.2%), followed by Guyana and Trinidad and Tobago (around 66%). This means that nearly three quarters and two thirds of world food inflation was transmitted to domestic food prices in the analyzed period, respectively. In Suriname, the pass-through coefficient is also high (53.7%). Pass-through coefficients were lower in the ECCU countries, with a maximum of 37.4% recorded by St. Vincent and the Grenadines. In Anguilla, Dominica and Grenada, almost one third of foreign food inflation was transmitted to domestic food prices. In the other Caribbean countries pass-through coefficients are lower, especially in Bahamas (15.5%) and Antigua and Barbuda (19.8%).

The magnitudes of the pass-through coefficients seem plausible and are comparable to those calculated by other recent studies for other countries. For instance, Dawe (2008) calculates in a similar fashion the pass-through coefficient of world rice inflation to domestic rice inflation in seven large Asian countries in Q4 2003-Q4 2007, finding low values in the Philippines (6%), India (9%) and Viet Nam (11%), but much higher in China (64%), Thailand (53%), Bangladesh (43%) and Indonesia (41%). Following a different methodology, using regression analysis for Colombia in Q1 1990-Q2 2008, Gómez P. (2008) found a pass-through coefficient of 16.8% of world food inflation adjusted by the nominal depreciation of domestic currency vis-à-vis the United States dollar. However, this adjustment is irrelevant in the Caribbean, since most countries either have in place fixed exchange rate regimes (ECCU, Bahamas, Barbados and Belize) or quasi-fixed regimes, such as Suriname and Trinidad and Tobago.

It is worth noting that the simple approach used to calculate pass-through coefficients above may be underestimating them, as it does not take into account the dynamics of the impact of world food inflation on headline inflation through the so-called second round effects. These materialize with a lag and stem from the effects of food inflation on non-food inflation due to cost pressures, particularly wage increases. These second round effects can be significant, as noted by Redrado (2008) who points out that up to the first quarter of 2008, the average wage in China rose by 26.9%, significantly above the average of the last five years (16.8%).

The last column of table 4 shows the weight of domestic food inflation on CPI inflation. This figure is especially high in St. Kitts and Nevis and St. Vincent and the Grenadines, where domestic food inflation accounted for almost 64% and 55% of headline inflation in the analyzed period, respectively. In Montserrat and Saint Lucia the transmission coefficient was also high: between 45% and 50%. In the case of the MDCs, the highest figure was exhibited by Guyana (42.7%) and Jamaica (39%). In contrast, Bahamas and Antigua and Barbuda were the countries less sensitive to (world and domestic) food inflation in July 2006-March 2008.

Taken into account both transmission channels discussed above, table 5 shows the likely impact of a 40% increase in world food prices on domestic food inflation and on CPI inflation in 2008, assuming that non-food inflation is the same as in 2007. Considering that to June 2008 (the latest available figure) international food prices climbed by around 45%, this scenario does not seem pessimistic. Comparing the resulting headline inflation rate in 2008 with that recorded in 2007, the impact varies across countries as shown by the last column of table 5. Within the MDCs, the effect is more significant in Jamaica, Suriname and Trinidad and Tobago that would see their inflation rates accelerating by 2.5 - 2.6 percentage points above the already high level posted in 2007. Thus, Jamaica's overall inflation rate would be near 20% whereas Suriname and Trinidad and Tobago would post inflation rates above 10%. The other MDC that would exhibit a two digit inflation rate (16.4%) is Guyana, 2.3 percentage points higher than in 2007. On the other hand, Barbados and Belize would record inflation rates in 2008 in excess of 5% with increases of 0.6 and 1.8 percentage points relative to 2007, respectively. As has been observed during recent years, Bahamas would be the country with the most stable price, posting an inflation rate of 3%, only 0.3 percentage points higher than in 2007. It is worth reiterating that these calculations assume that there will be no changes in economic policies such as price controls, tax exemptions and subsidies during 2008.

**Table 5: Impact of an increase of 40% in world food prices on domestic food inflation and
on headline inflation, 2008e**
(Percentage points)

	Food inflation		Non-food inflation	Headline inflation		
	2007[a]	2008e	2007[a]	2007[a]	2008e	Difference
MDCs						
Bahamas	3.4	6.2	2.5	2.7	3.0	0.3
Barbados	8.9	10.9	2.2	4.7	5.3	0.6
Belize	5.8	11.4	3.1	4.1	5.9	1.8
Guyana	20.6	26.3	9.1	14.1	16.4	2.3
Jamaica	25.2	30.5	12.3	16.8	19.4	2.6
Suriname	12.4	21.5	6.5	8.3	10.8	2.5
Trinidad and Tobago	16.8	26.4	4.0	7.6	10.2	2.6
ECCU						
Anguilla	6.7	13.6	2.2	3.5	5.7	2.2
Antigua and Barbuda	7.0	7.9	4.6	5.1	5.3	0.2
Dominica	7.4	14.3	3.4	4.8	7.1	2.3
Grenada	11.8	12.7	4.8	7.4	7.7	0.3
Montserrat	5.6	7.0	2.6	4.0	4.6	0.6
St. Kitts and Nevis	5.6	8.7	4.1	4.5	7.0	2.5
St. Lucia	13.7	11.3	0.7	8.2	5.8	-2.4
St. Vincent and the Grenadines	9.5	14.9	6.8	8.3	11.2	2.9

Source: ECLAC's calculations and ECLAC (2008).
e = estimation
[a] Observed.

In the case of the ECCU countries, there are clearly two groups of countries and one outlier. On the one hand, Anguilla, Dominica, St. Kitts and Nevis and St. Vincent and the Grenadines would be the most affected countries, with their inflation rates increasing between 2.2 percentage points in Anguilla and 2.9 in St. Vincent and the Grenadines relative to 2007. The latter country would post an inflation rate of 11.2% in 2008, being the only ECCU country that would post a two digit inflation rate. On the other hand, in Antigua and Barbuda, Grenada and Montserrat inflation rates would be only marginally affected (below 0.6 percentage points). Surprisingly, Saint Lucia would witness a reduction of 2.4 percentage points in the inflation rate posted in 2007, which deserves further exploration on why food inflation was so high in 2007 (13.7%).

Overall, further increases in world food prices would continue to exert a significant impact on domestic inflation rates in Caribbean countries, implying either nearly replicating the already high inflation rates posted in 2007 or, still worse, inflation accelerations of more than two percentage points.

C. IMPORT BILL AND TRADE BALANCE

As mentioned above, Caribbean countries are net importers of food. Thus, the increase in world food prices will also have a negative impact on trade (and current account) balances. Table 6 shows merchandise imports composition in 2007. In the MDCs, food imports' share in total goods' imports range from 7.3% in Trinidad and Tobago to 17.8% in Barbados. These values are somewhat higher in ECCU countries, where four of the six countries where data is available (Dominica, St. Kitts and Nevis, Saint Lucia and St. Vincent and the Grenadines) exhibited food imports-to-total imports ratios above 15%.

Table 6: Merchandise imports composition, 2007
(Percentage)

	Food	Non-food	Total (Million of US$)
MDCs			
Bahamas	16.2	83.8	3,104
Barbados	17.8	82.2	1,497
Belize	9.9	90.1	708
Guyana	10.7	89.3	1,063
Jamaica	12.2	87.8	6,597
Suriname	..	..	..
Trinidad and Tobago	7.3	92.7	5,477
ECCU			
Anguilla	8.8	91.2	246
Antigua and Barbuda	11.4	88.6	727
Dominica	18.1	81.9	198
Grenada	..	..	..
Montserrat	..	..	..
St. Kitts and Nevis	15.9	84.1	273
St. Lucia	16.0	84.0	615
St. Vincent and the Grenadines	18.2	81.8	313

Source: Central Banks and other official sources.
.. = not available.

A traditional indicator used to evaluate a country's vulnerability to external shocks is the import coverage (in months) provided by net international reserves available to the central bank. Countries with higher levels of international reserves in relation to their import requirements would be more resilient to external shocks. Combining this indicator with the food imports-to-total goods imports ratio, figure 18 maps the external vulnerability of Caribbean countries attached to imported food dependence and rising world food prices. In this case, countries located in the upper left hand quadrant are more vulnerable whereas those located in the lower right hand quadrant are less sensitive to increases in international food prices. The quadrants are determined by regional (simple) averages of the share of food imports on total imports (13.3%) and of imports coverage (4.8 months).

Figure 18: External vulnerability to rising world food prices, 2007
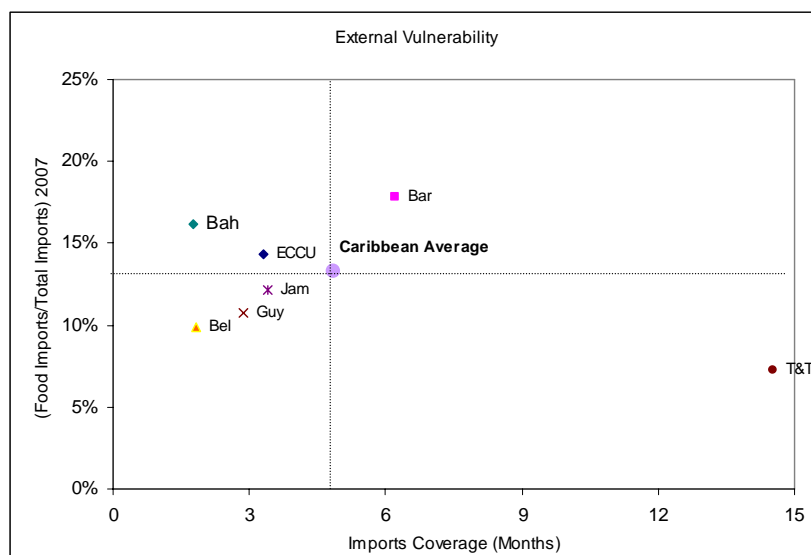
Overall, Bahamas appears to be the most vulnerable country in the Caribbean as a result of a relatively high food imports-to-total imports ratio (16.2%) coupled with a low level of international reserves, equivalent to only 1.8 months of imports. Similarly, taken as a group, the ECCU countries also present a high level of vulnerability, with above average share of food imports on total imports (14.3%) and below average import coverage (4 months). Although Belize exhibits imports coverage of international reserves as low as Bahamas, its situation is comparatively better because food imports share in total imports is lower (9.9%). Likewise, Guyana and Jamaica combine a low level of imports coverage with a below average food imports-to-total imports ratio, to the tune of 10.7% and 12.2%, respectively. The opposite is true in Barbados, as this country counterbalances its relatively high food imports (17.8% of total imports) with international reserves coverage of 6.2 months, the highest in the region, after Trinidad and Tobago. The latter country shows a completely different picture, by far the strongest position in the region. Being an exporter of oil and gas, Trinidad and Tobago has accumulated significant trade and current account surpluses over the last few years, fuelled by rising energy prices in world markets. Consequently, net international reserves have soared, tripling between 2003 and 2007, when they amounted to US$6,659 million, or 14.5 months of imports.

How would an increase of 40% in world food prices affect import bills? Assuming an income elasticity of demand for food equal to one – so that imports as a share of GDP remains unchanged at constant prices –, a price elasticity of food imports demand of -0.2,[16] and GDP growth rates in 2008 equal to the midpoint of the range forecasted by ECLAC (2008),[17] table 7 presents the food imports bill forecast.

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[16] This implies that the increase of 40% in world food prices will decrease food import volumes in 8%.
[17] See Annex II.

Table 7: Impact on import bills of a 40% increase in world food prices, 2008e
(Millions of US$)

	Food imports value 2007	Food imports value 2008e	Increase in food imports value 2008e	Increase in food imports value (% of GDP)e[a]
MDCs				
Bahamas	503	675	172	2.3
Barbados	266	359	93	2.4
Belize	70	94	24	1.8
Guyana	114	156	42	3.2
Jamaica	803	1,084	281	2.1
Suriname	..	..	..	..
Trinidad and Tobago	398	541	142	0.6
ECCU				
Anguilla	22	30	8	3.4
Antigua and Barbuda	83	114	31	2.4
Dominica	36	48	12	3.2
Grenada	..	..	..	..
Montserrat	..	..	..	..
St. Kitts and Nevis	43	59	15	2.6
St. Lucia	98	132	34	3.3
St. Vincent and the Grenadines	57	78	21	3.3

Source: ECLAC calculations.
[a] 2008 GDP in US$ at current prices calculated assuming the estimated inflation rate showed in Table 4,
   a constant nominal exchange rate, and a real output growth equal to the midpoint of the range forecasted
   by ECLAC (2008).
e = estimation.
.. = not available.

As shown, the effects of a world food inflation rate of 40% on the import bills are significant in all countries, with the exception of Trinidad and Tobago whose GDP is relatively high due to the importance of oil and gas output. The impact would be more than three percentage points of GDP in Guyana, Anguilla, Dominica, Saint Lucia and St. Vincent and the Grenadines; and between 1.8 (Belize) and 2.6 percentage points of output (St. Kitts and Nevis) in all others.

This would widen the already massive trade (and current account) deficits in most countries.[18] In MDCs, for instance, trade deficits as a share of GDP in 2007 were in the 30%-35% range in the Bahamas, Barbados, Guyana and Jamaica. In ECCU countries the trade gap was even more pronounced, above 35% of GDP in all cases, with a maximum as high as 96% of output recorded by Anguilla. Thus, a further increase in the world food crisis will make external vulnerability more acute.

As net importers of food, Caribbean countries need to get the financial resources and foreign exchange to finance the import bill. Although food imports dependency is not a recent but a chronic problem, its economic and social relevance has increased under the current context

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[18] The exceptions are Suriname and Trinidad and Tobago that recorded trade and current account surpluses in 2007 due to their significant exports of oil and/or mining products. For instance, the latter country posted trade and current account surpluses of 21.8% and 18.6% or GDP, respectively.

of high international food prices. With several countries in the region challenged by considerable dependency on imported food, insufficient levels of economic development and diversification, and low levels of international reserves, the already high external vulnerability is on the rise.

D. POVERTY AND INDIGENCE

Poverty reduction is the most important development goal in developing countries. It is no coincidence that eradicating extreme poverty (i.e. indigence) and hunger is the first of the Millennium Development Goals[19]. The Caribbean is not an exception, although poverty and indigence rates in some countries are much lower than in others, as table 8 shows. In general, indigents are defined as people not able to afford a food consumption basket that provides a minimum amount of kilocalories per day, whereas poverty refers to the population with no capacity to purchase a basic consumption basket that also includes non-food items.

Table 8: Poverty rate and indigence rate, last year available
(Percentage of total population)

	Indigence rate	Poverty rate including indigence
MDCs		
Bahamas (2001)	..	9.3
Barbados	..	..
Belize (2002)	10.8	33.5
Guyana (2007)	13.0	31.0
Jamaica (2006)	..	14.3
Suriname (2000)	20.0	63.1
Trinidad and Tobago (2005)	1.2	16.7
ECCU		
Anguilla (2002)	2.0	23.0
Antigua and Barbuda (2005-2006)	3.7	18.3
Dominica (2002-2003)	15.0	39.0
Grenada	..	..
Montserrat	..	..
St. Kitts and Nevis (1999-2000)	12.9	31.0
St. Lucia (2005-2006)	1.6	28.8
St. Vincent and the Grenadines	..	..

Source: Survey of Living Conditions except for Belize (Living Standards Measurement Survey), Guyana (Household Income and Expenditure Survey) and Suriname (General Bureau of Statistics).
.. = not available.

Clearly, Suriname stands out, with a poverty rate of 63.1%. Far below but with a still high poverty incidence is Dominica (39%), followed by Belize, Guyana, and St. Kitts and Nevis where about one third of the population lived under the poverty line in the year of the survey. On the contrary, Bahamas exhibits a poverty rate below 10%, the lowest within the region. The other countries are in an intermediate position, with poverty rates ranging between 14.3% in Jamaica and 28.8% in Saint Lucia. Data for Montserrat were not available and those for Barbados, Grenada and St. Vincent and the Grenadines were too outdated. In the countries that report indigence rates, the highest was again reported in Suriname (20%). In Belize, Guyana, Dominica

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[19] See United Nations (2008).

and St. Kitts and Nevis it stood between 10% and 15%, while in Trinidad and Tobago, Anguilla, Antigua and Barbuda and Saint Lucia it was less than 4%.[20]

Inflation affects poverty and indigence rates through the erosion of real incomes of the population. As indigents are defined as individuals not able to afford a basic food consumption basket, and the poor as those not able to purchase this food basket plus some other basic non-food products, food inflation will not only erode the purchasing power of income but will also raise poverty and indigence lines significantly. Thus, the current escalation in world food prices would have a perceptible effect on poverty and indigence rates around the globe. Therefore, the question of how many people would be thrown into poverty and indigence by the current situation is of the highest relevance.

Unfortunately, in most Caribbean countries the needed statistical information is not available (or not accessible). Moreover, even at the country level addressing this issue deserves an independent study, so that it goes beyond the scope of the present report. However, in order to shed some light on this critical issue, an analysis is presented for Trinidad and Tobago, the country where the accessible information lent itself to a preliminary assessment.

The last Trinidad and Tobago Survey of Living Conditions (SLC) estimates the indigence and the poverty line in 2005 at TS$ 255 and TT$665 per month, respectively. The indigence rate is 1.2% (or 0.8% of households) and the poverty rate is 16.7% (or 11% of households). This source also states that the maximum per capita consumption level within the poorest quintile (20% of the poorest households representing 29.1% of the population) amounts to TT$884 per month. Dividing the first quintile in 20 equal segments (i.e. percentiles) and assuming that the difference in per capita consumption from one percentile to the next is uniform between the percentile of the indigence line (i.e. the first) and the one of the poverty line (i.e. the 11th), and then between the latter and the last one within the first quintile (i.e. the 20th), it is possible to derive values for per capita consumption expenditure for each percentile from the first (the poorest) to the 20th (the richest within the poorest quintile). The results are shown in table 9.

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[20] It is worth noting that as these figures correspond to different years ranging from 2000 in Suriname to 2007 in Guyana this comparison is done just for illustrative purposes.

**Table 9: Trinidad and Tobago: Per capita monthly consumption expenditure by percentile,
2005, 2007e and 2008e**
(TT$ at current prices)

Household percentile (%)	Cumulative percentage of population (%)	Per capita monthly consumption expenditure 2005	Per capita monthly consumption expenditure 2007e	Per capita monthly consumption expenditure 2008e
0.8 (Indigence line 2005)	**1.2**	**255**	299	330
1	1.7	268	315	338
2 (Indigence line 2007e)	**3.2**	308	**361**	390
3	4.7	348	408	441
3.3 (Indigence line 2008e)	**5.0**	355	416	**459**
4	6.2	387	455	501
5	7.7	427	501	552
6	9.2	467	548	604
7	10.7	506	594	655
8	12.2	546	641	706
9	13.7	586	688	758
10	15.2	625	734	809
11 (Poverty line 2005)	**16.7**	**665**	781	861
12 (Poverty line 2007e)	**18.1**	689	**809**	892
13 (Poverty line 2008e)	**19.5**	714	838	**924**
14	20.8	738	866	955
15	22.2	762	895	987
16	23.6	787	923	1,018
17	25.0	811	952	1,049
18	26.3	835	981	1,081
19	27.7	860	1,009	1,112
20	29.1	884	1,038	1,144

Source: ECLAC calculations on the basis of Kairi Consultants Ltd. (2007).
e = estimation.

The third column shows monthly per capita consumption levels adjusting the values of 2005 by CPI inflation in 2006 and 2007, thus assuming that per capita consumption levels remained constant in real terms. By the same token, indigence and poverty lines are updated to 2007 using food and non-food inflation rates observed in the period. Based on these calculations, the indigence rate would have increased from 1.2% in 2005 to 3.7% in 2007, whereas the poverty rate would have done so from 16.7% to 18.1% in the same period. This means that between 2005 and 2007 some 26,000 already poor people would have faced indigence and another 19,000 people would have been pushed below the poverty line.

The last column of table 9 shows the impact on per capita consumption levels of an increase in world food prices of 40% in 2008. Under the same assumptions used to update 2005 figures to 2007, the new indigence line would climb to TT$459 a month per person whereas the poverty line would move to TT$924. The corresponding indigence and poverty rates would be 5% and 19.5%, respectively. As compared to the estimate for 2007, some extra 20,500 Trinidad and Tobago's nationals would become poor and around 23,500 that were already poor would fall into indigence. Obviously, world food inflation affects more indigence than poverty rates because the former is defined based on a consumption basket exclusively compounded by food whereas the latter's consumption basket also includes non-food goods whose prices are not directly affected by food inflation.

Should the Trinidadian authorities seek to prevent indigence and poverty rates from going up in 2008 relative to 2007 they should assist the vulnerable population through social programmes. The direct cost of such programmes – i.e. excluding the administrative costs – would amount to some TT$27.6 million to maintain vulnerable poor people above the indigence line, to around TT$28.2 million to keep vulnerable non-poor people from poverty. This amount is small both as a share of GDP and as a share of fiscal revenue, totalling some 0.04% of projected output and 0.2% of projected revenue. Of course, this would be the programme's cost with perfect targeting of the beneficiaries. The main results of the effects of an increase in world food prices of 40% on poverty and indigence in Trinidad and Tobago are summarized in table 10.

Table 10: Trinidad and Tobago: Impact on poverty and indigence rates of an increase of 40% in world food prices, 2008e
(Percentage of total population)

	2007e	2008e	Difference (People)	Cost of compensatory program (TT$)
Indigence rate	3.2	5.0	23,500	27,600,000
Poverty rate	18.1	19.5	20,500	28,200,000

Source: ECLAC calculations based on Table 8.
e = estimated.

Figure 19 presents official indigence and poverty rates in 2005, as well as the ones estimated above. It is worth noting that this analysis is based on a number of assumptions. In particular, it is assumed that the distribution of consumption remains constant, and that the difference in consumption per person from one percentile to the next is the same between the original indigence line (i.e. the official 2005 figure) and the original poverty line, and then between the latter and the richest percentile within the poorest quintile (i.e. the 20th). But perhaps the strongest assumption is that social policies are totally ineffective to offset the increase in poverty and indigence. Actually, effective from 1 October 2008, public assistance grants increased substantially, ranging from 16% for households of four persons and above, to 31% for single person households. This would amount to some TT$50.4 million during fiscal year 2008/09.[21] This amount is near 90% of the TT$55.8 million estimated above to keep indigence and poverty rates constant in 2008.

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[21] See Government of the Republic of Trinidad and Tobago (2008).

Figure 19: Indigence and poverty rates, 2005, 2007e and 2008e
(Percentage of total population)
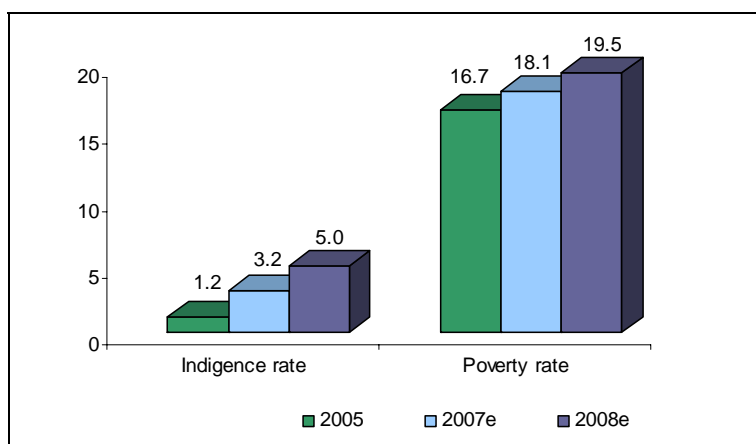
Source: Table 9.

E. INEQUALITY

The Gini coefficient is the most used indicator of inequality. According to the United Nations Development Programme (UNDP) (2008), the Gini coefficient in the world ranges from 0.247 in Denmark (the best distribution) to 0.632 in Lesotho (the worst distribution). This source reports a value of 0.455 for Jamaica in 2004 and of 0.389 for Trinidad and Tobago in 1992. Table 11 presents Gini coefficients from national household surveys of Caribbean countries. According to this measure, the most unequal Caribbean country is the Bahamas (0.57), followed by Guyana (0.50) and Antigua and Barbuda (0.48). On the contrary, the most even countries are Anguilla (0.31) and Dominica (0.35). The other countries are in an intermediate position.

Table 11: Gini coefficient, last year available

MDCs	
Bahamas (2001)	0.57
Barbados	..
Belize (2002)	0.40
Guyana (2007)	0.50
Jamaica (2006)	..
Suriname (2000)	..
Trinidad and Tobago (2005)	0.39
ECCU	
Anguilla (2002)	0.31
Antigua and Barbuda (2005-2006)	0.48
Dominica (2002-2003)	0.35
Grenada	..
Montserrat	..
St. Kitts and Nevis (1999-2000)	0.39
St. Lucia (2005-2006)	0.42
St. Vincent and the Grenadines	..

Source: Survey of Living Conditions except for Belize (Living Standards Measurement Survey), Guyana (Household Income and Expenditure Survey) and Suriname (General Bureau of Statistics).

.. = not available.

As noted in the introduction, inflation is regressive, and food inflation is even more so. This is because the poor devote a larger share of their income/expenditure to purchase staples and other foodstuff. This is confirmed by table 12 that presents food expenditure share in consumption expenditure by quintiles in countries where information was available.[22] When comparing the percentage of consumption expenditure devoted to food of the poorest quintile relative to the richest, the last column shows that the former is almost three times the latter in Anguilla, more than twice in Antigua and Barbuda and Dominica, and around 70% higher in Trinidad and Tobago and Saint Lucia. In Jamaica the difference is lower (43.7%), as the richest quintile devotes more than a third of their consumption expenditure (35.9%) to purchase food, by far the largest share within the six countries, where this figure is below 25%.

Table 12: Per capita annual consumption expenditure in food by quintile, last year available
(Share in total consumption expenditure)

	I	II	III	IV	V	I/V (%)
Jamaica (2003)	51.6	49.1	49.8	45.1	35.9	143.7
Trinidad and Tobago (2005)	41.1	36.2	31.4	28.4	23.7	173.4
Anguilla (2002)	35.0	27.0	23.0	20.0	12.0	291.7
Antigua and Barbuda (2005-2006)	40.6	37.5	27.9	22.2	18.3	221.9
Dominica (2002-2003)	54.0	47.0	47.0	38.0	24.0	225.0
St. Lucia (2005-2006)	32.4	29.9	30.4	25.1	19.2	168.8

Source: National household surveys.

This means that food inflation will have different impacts on people according to their quintile location, more adversely affecting the poorest households of the population distribution. Assuming that in 2008 food, non-food and headline inflation are those shown in table 5, table 13 shows the inflation rate that would be faced by each quintile of households considering the different weight that food has in their consumption baskets in the presence of a 40% increase in world food prices.

Table 13: Inflation by quintile with a 40% increase in world food prices, 2008e
(Percentage)

	I	II	III	IV	V	I/V
Jamaica	21.6	20.6	20.9	18.9	15.0	144.2
Trinidad and Tobago	13.1	11.5	10.0	9.0	7.5	174.3
Anguilla	8.5	6.5	5.6	4.8	2.9	296.2
Antigua and Barbuda	7.4	6.8	5.1	4.0	3.3	226.6
Dominica	9.1	7.9	7.9	6.4	4.0	226.7
St. Lucia	6.9	6.3	6.4	5.3	4.1	169.0

Source: ECLAC calculations based on Table 12.
e = estimation.

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[22] Except for Jamaica, that defines the quintiles as a percentage of population, the other five countries do so as a percentage of households. In what follows, all quintile information at the level of the household has been translated in per capita terms. As on average poorest households have more members than the richest, in the five countries the first quintile has more individuals than the second one, the second quintile than the third one and so on.

As expected, in the described scenario the inter-quintile inflation rate would be decreasing in the consumption expenditure level. The inflation rate of the poorest quintile would be almost three times that of the richest in Anguilla, and more than twice as high in Antigua and Barbuda and Dominica. In Trinidad and Tobago and Saint Lucia the inflation of the poorest 20% of the population would be 70%-75% higher than that of the 20% richest. The difference would be lower in Jamaica, just below 45%. Inflation rates of the poorest and the richest quintiles are shown in figure 20.

**Figure 20: Inflation faced by the poorest and the richest quintile
with a world food prices increase of 40%, 2008e**
(Percentage)
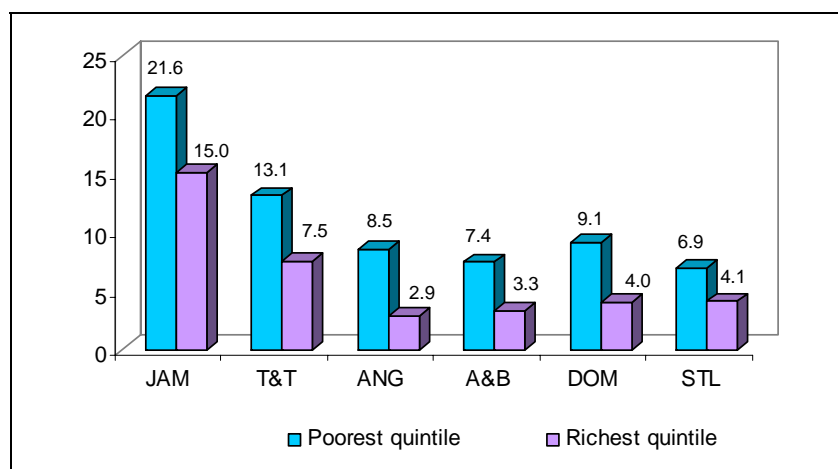
Source: Table 10.
e = estimation.

In order to assess the distributional impact of the difference in inflation rates that the different quintiles would face in 2008 in the presence of an increase in world food prices of 40%, the first issue to be addressed is the fact that available national household surveys correspond to different years, so that it is necessary to standardize them. This means adjusting the per capita consumption levels by quintiles reported so as to anchor them in the same year, in this case 2007. Following Dessus *et al* (2008), this is done assuming that the distribution of consumption in the survey year and 2007 remained unchanged and that for all individuals it grew at a rate equal to private consumption as reported in the national accounts. Acknowledging that these assumptions are strong, it seems the best way to proceed given the information constraints. Table 14 shows the results.

Table 14: Per capita total annual consumption expenditure by quintile, 2007e
(Local currency at current prices)

	I	II	III	IV	V	V/I
JAM	49,135	77,846	109,501	149,388	310,054	6.3
T&T	12,746	22,583	32,771	48,755	105,573	8.3
ANG	9,721	18,821	28,956	49,432	120,994	12.4
A&B	3,584	7,228	10,170	14,888	41,394	11.5
DOM	2,527	4,764	7,456	11,833	28,499	11.3
STL	2,963	5,245	7,076	10,825	24,852	8.4

Source: ECLAC calculations based on national household surveys and national accounts.
e = estimated.

The last column provides a popular measure of inequality, i.e. the ratio of per capita consumption of the richest quintile to that of the poorest quintile. Although this indicator does not inform about the distribution in the intermediate quintiles, it is very useful given its calculation simplicity and its straightforward interpretation. Clearly, the most unequal countries of the sample by this standard are those of the ECCU, especially Anguilla, where the richest quintile per head consumption is 12.4 times the corresponding of the poorest quintile, followed by Antigua and Barbuda (11.5) and Dominica (11.3). In the other countries the difference is lower, with values of 8.4 times in Saint Lucia and 8.3 in Trinidad and Tobago. The country where the inequality in the distribution of consumption is more intense is Jamaica, where the richest 20% of the population consumes (a still high) 6.3 times that of the poorest 20% in per capita terms. It is worth noting that unlike Latin America, the most unequal region of the world, the Caribbean countries are not particularly unequal by international standards.[23]

How would this indicator be affected by a 40% increase in world food prices in 2008? Assuming that consumption expenditure in all quintiles increases at the same rate as nominal GDP[24] and deflating the resulting per capita consumption levels by the corresponding estimated inflation rate by quintiles as shown in table 13, table 15 presents the estimated consumption per person at 2007 prices.

**Table 15: Per capita total annual consumption expenditure by quintile after a 40%
increase in world food prices, 2008e**
(Local currency at 2007 prices)

|	I	II	III	IV	V	V/I
JAM	49,478	79,040	110,905	153,848	330,140	6.7
T&T	13,067	23,484	34,544	51,864	113,872	8.7
ANG	9,985	19,696	30,560	52,569	131,047	13.1
A&B	3,689	7,482	10,697	15,826	44,299	12.0
DOM	2,544	4,850	7,591	12,217	30,109	11.8
STL	3,009	5,356	7,219	11,159	25,914	8.6

Source: ECLAC's calculations based on national household surveys and national accounts.
e = estimated.

The last column shows the ratio of per capita consumption in the richest quintile to per head consumption in the poorest one. To better realize the increase in inequality brought about by the increase of 40% in world food prices and the resulting differences of the inflation rate faced by the different quintiles of the population, figure 21 shows these ratios estimated for 2007 and 2008.

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[23] According to UNDP (2008), the most equal country by this indicator is Japan (3.4) whereas the most unequal is Sierra Leone (57.6). Within developed countries, this figure is 8.5 in the United States, 7.2 in the United Kingdom, and 3.9 in Norway. In Latin America, the value of this indicator ranges from 12.8 in Mexico to 42.3 in Bolivia. In the Caribbean, this source reports a figure of 7.6 in Trinidad and Tobago (corresponding to 1992), 9.8 in Jamaica (2004), 26.6 in Haiti (2001) and 14.3 in the Dominican Republic (2004).
[24] Considering a real GDP growth rate equal to the midpoint of the range forecasted by ECLAC (2008) shown in Annex I and the inflation rate estimated for 2008 presented in table 5.

Figure 21: Per capita consumption of the richest quintile of the population, 2007 and 2008e
(Percentage of per capita consumption of the poorest quintile at 2007 prices)
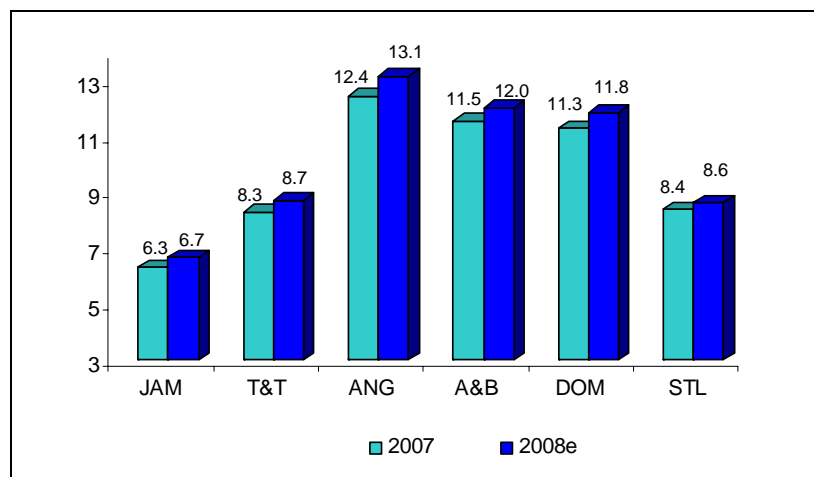
Source: Tables 10 and 11.
e = estimated.

As can be seen, in all cases per capita consumption inequality increases. Although the increase in the concentration of per capita consumption may seem modest, it is not the case. In general, inequality indicators tend to vary very slowly. Indeed, increases in the per capita consumption ratio of the richest quintile vis-à-vis the poorest quintile from one year to another as those estimated are significant, especially in Jamaica (6.3%), Anguilla (5.6%) and Trinidad and Tobago (4.8%). Therefore, the distributional impact of the hike in world food prices needs to be considered in the design and implementation of policies devised to reduce its effects.

IV.   CONCLUSIONS

This report analyses the escalation in world food prices and its likely impact on the Caribbean. The preliminary econometric results presented indicate that the main drivers of world food inflation in recent years appear to be a combination of structural and temporary factors. Within the former are China's imports growth and ethanol production in the United States, whereas the latter include the depreciation of the United States dollar and investment in futures and options in international food markets. Thus, this phenomenon is likely to persist, although with a more moderate intensity than the one observed during 2007 and the first half of 2008. Perhaps the best guess would be that world food prices might stabilize at some point at a lower level than that observed during the first months of 2008, but certainly far above the levels recorded during the first half of the current decade.

Assuming an increase in world food prices of 40% during 2008, the report analyses four channels of influence of such an event, namely domestic inflation, imports value, poverty and indigence rates, and inequality. Calculations were made with information available up to August 2008, which at most included data up to June. Therefore, the effects of the global financial crisis that started shocking the world economy in late September were not considered in the analysis.

Estimations reveal that domestic inflation would accelerate in most countries between 2 and 3 percentage points relative to 2007, which is worrisome as in the latter year inflation already gained momentum. As regards the import bill, in most countries imports value would

increase between 1.8 and 3.4 percentage points of GDP, widening the trade and current account gaps, which exhibited levels above 20% and even 30% of GDP in several countries in 2007. Due to data limitations, the study on the impact of external food inflation on poverty and indigence was only carried out for Trinidad and Tobago. The effect would be significant, with the indigence rate climbing from 3.2% in 2007 to 5% in 2008 and the poverty rate from 18.1% to 19.5% in the same period. Last but not least, food inflation would also have adverse distributional effects, increasing the ratio of the richest quintile per capita consumption to the poorest quintile in 2008 relative to 2007 in the six Caribbean countries where data were available.

The main policy implications include:

(a)   To foster anti-inflationary policies (monetary, fiscal and exchange rate) putting in place an economic policy mix consistent with increasing the funding of social programmes. This may include tax reforms that raise fiscal revenue through the widening of tax bases rather than increasing rates or introducing new taxes;

(b)   To introduce competition in the distribution and commercialization of imported food to enable reductions in international food prices to be transferred to consumers thus helping to fight inflation and increasing domestic consumption and overall welfare;

(c)   To reduce imported food dependence by promoting domestic production of some agricultural products. Given the small size of domestic markets and taking into account constraints (actual or potential) in productive resources such as land, water and labour, this could be addressed at the regional level through the Caribbean Community (CARICOM);

(d)   To compress imported foodstuff consumption by promoting consumption and nutrition patterns less dependent on imported food, particularly in products based on wheat given that this grain is not produced in the region;

(e)   To implement social programmes well targeted to the poor and vulnerable population (children, elderly, HIV/AIDS infected people, pregnant and breastfeeding women, etc.) focused on providing food support; and

(f)   To link nutrition and health policies, taking the former as prevention health policies.

There is no debate on the need for Caribbean countries to devise economic policies to control inflation and to reduce the external deficit. By the same token, there is consensus regarding the convenience of reducing poverty and indigence through social programmes and other policy tools. However, the deterioration of income and expenditure distribution that food inflation brings about should not be overlooked, as it may exert perverse influence on economic growth and development. Some economists have argued that equity considerations are irrelevant if poverty is actually defeated: once every household is above the poverty line it does not matter how income is distributed. Moreover, it can be argued that a concentration of income would be desirable inasmuch as it would foster the savings and investment process due to the higher propensity to save of the rich. Nevertheless, social capital is another factor of production needed to foster economic growth.[25] The concept of social capital alludes to civic norms that are in place

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[25] See, for instance, Temple and Johnson (1998).

in a society, to the level of trust among their inhabitants, to the capacity to generate social consensus, and to the degree of cooperation among different groups and individuals (Dasgupta and Serageldin, 2000). Certainly equity is one of the main elements to promote social capital formation, let alone the cornerstone of a democratic society. This is not at all egalitarianism. It is effective equality of opportunities.

Annex I

Variables and sources for the econometric estimation of world food inflation

Variable	Definition	Source
World food inflation rate	Percentage change of food price index	Food and Agriculture Organisation
Oil prices increases	Percentage change of oil prices in US$ per barrel (WTI and Brent)[a]	International Monetary Fund
Fertilizers prices increases	Percentage change of fertilizer prices in US$ per metric ton (diammonium phosphate, phosphate rock, potash, triple super phosphate and bulk urea)[a]	International Monetary Fund
Chinese imports volumes	Percentage change of Chinese imports in $Y deflated by Chinese CPI	International Monetary Fund
Indian imports volumes	Percentage change of Indian imports in $R deflated by Indian CPI	International Monetary Fund
Ethanol production	Ethanol production in the United States in thousands of barrels	United States Renewable Fuel Association
Speculative investment in agriculture commodities future and options markets	Percentage change in the number of futures and options contracts in wheat, corn, oats, soybean, soybean meal, soybean oil and rough rice	Chicago Board of Trade
Depreciation of the United States dollar	Depreciation rate of the United States dollar vis-à-vis the Euro	International Monetary Fund

Source: Own elaboration.
[a] Each type was used alternatively in different specifications of the model.

Annex II

GDP growth rate, 2008f
(Percentage)

MDCs[a]	**3.5-4.0**
Bahamas	2.0-2.5
Barbados	2.5-3.0
Belize	2.0-2.5
Guyana	4.5-5.0
Jamaica	2.8-3.3
Suriname	5.0-5.5
Trinidad and Tobago	5.5-6.0
ECCU[a]	**3.5-4.0**
Anguilla	5.5-6.0
Antigua and Barbuda	5.0-5.5
Dominica	2.5-3.0
Grenada	2.5-3.0
Montserrat	3.0-3.5
St. Kitts and Nevis	3.0-3.5
St. Lucia	2.5-3.0
St. Vincent and the Grenadines	4.0-4.5

Source: ECLAC (2008).
[a] Simple average.
f = forecast.

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