

**A STUDY ON THE
IMPACT OF COVID-19 ON
RETAIL PRICES**

TRADE DIVISION

11.11.2020 [revised]

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List of Abbreviations:

VAR	Vector Auto- Regressive
IRF	Impulse Response Functions
MERI	Mauritius Exchange Rate Index
GDP	Gross Domestic Products
IPIFLA	Import Price Index Food and Live Animals
PPIFB	Producer Price Index Food and Beverages
CPIFB	Consumer Price Index Food and Beverages
OECD	Organisation for Economic Co-Operation and Development
UNCTAD	United Nations Conference on Trade and Development

EXECUTIVE SUMMARY

1. As a highly food import dependent country, Mauritius is vulnerable to exogenous economic shocks including, inter-alia, exchange rates volatility, shocks in demand and supply, swings in world output, geopolitics disturbances, global trade imbalances and global crisis. The effects of COVID-19 have not spared Mauritius and its daunting impacts are not only seen on health institutions but on the overall economy, especially on commodity prices.
2. This report aims to explore the evolution of prices of basic commodities over the COVID-19 period, and to analyse the different causes of the price fluctuations of selected basic staples on the local market.
3. A hypothetical basket of basic commodities was designed to assess the evolution of retail prices on a fixed set of consumer goods. The basket of goods was composed of 32 distinct groups of products. The prices of each group of products have been collected and compiled from 4 major retail chain companies, namely: Winner's, Super U, LondonWay and DreamPrice, for the period January to August 2020.
4. The major traded currencies appreciated by 14% in the third quarter 2020 as compared to the same quarter in 2019. In the first quarter of 2020, the prices of selected products in the hypothetical basket of goods, such as milk, imported edible oil, cereals, black lentils, corn mutton, sardines, canned tomatoes, fruit juice and home cleaning products, displayed an increase of 1.21% during the COVID-19 period. Similarly, the locally manufactured products from the basket of goods also showed an increase in retail prices of 2.54% in April 2020. However, after month of April, the average prices of locally manufactured products fell and rose again in the months of July and August 2020.
5. Using several quantitative techniques, the identified possible causes of price fluctuations such as the effect of the appreciation in foreign currencies, freight costs, shortage of basic commodities on the market, demand shocks, unfair practices and abnormal market behaviours, were evaluated and analysed.
6. The study reveals that the appreciation of the foreign exchange rates was most likely to cause the increase in consumer prices. It has been observed that following a one percent appreciation in the foreign currencies, about 10.38% of the appreciation was absorbed by the importer while

2.17% was transmitted to the consumer prices for foodstuffs. One of the reasons advocated was that importers did not transmit the full impact of the appreciation of the foreign currencies on consumers as the foodstuff sector is a highly competitive business segment and increase in prices may lead to a fall in the market share.

7. In addition, it has been analysed that fluctuations in the freight cost was fully transmitted to the consumer prices. However, freight and insurance costs did not have any significant associated effects on the retail prices of the products in the hypothetical basket of basic commodities. Likewise, no sign of short supply of basic commodities was observed and the fluctuations in the supply of the basic commodities did not have any impact on the retail prices.
8. The study also assessed the presence of any exploitative pricing and abuse from the retail chain companies. Despite the fact that signs of panic buying were observed for the months of February and March 2020, there were however, no signs of abusive pricing and practices with respect to the local demand shocks (panic buying and hoarding). Moreover, the locally produced substitutes were not subject to increase in their retail prices. It was also observed that consumers behaved irrationally with respect to certain basic commodities.
9. Using scenario based forecasting, with government interventions on local markets, it is expected that retail prices will fall. On the other hand, with minimum government interventions on local market, for the next quarter, it is expected that retail prices of foodstuff will increase and thereafter the consumer prices will stabilise at a higher price. This may be attributed to the effect of price bubbles whereby increase in prices may not be sustainable and would subsequently, stabilise or reduce to meet the expected demand and propensity to consume. With regard to the hypothetical basket of goods, the prices of selected items are expected to fall as from October 2020.
10. The study could be extended to represent other commodities such as agricultural products, utilities and basic expenses (e.g. transport cost) for a profound analysis, and a monitoring mechanism be implemented to gather information on prices and consumption patterns at regular intervals. In addition, the study may be oriented to observe the retail price movements of basic commodities in small shops in different areas across the island.
11. In addition, the “observatoire des prix” may be revamped to assess the evolution of retail prices of basic commodities and to ensure transparency of the prices. Following the communique from

the Association Professionnelle des Transitaires and the Association des Courtiers Agrées en Douane, shipping delays between 54 and 60 days are expected for consignments to reach Mauritius. As such, a work plan should be established to ensure the supply of basic commodities on the local market. In addition, educational and sensitisation campaigns could be carried out with an objective to limit irrational consumers' behaviours during peak periods, festive periods and during period of crisis.

Section 1: Introduction, Objectives, Scope and Structure of the Report

Introduction

1.1 Mauritius is an import reliant economy whereby more than 70% of the country's food requirements are sourced from the international markets¹. Being a small open economy, Mauritius is vulnerable to external exogenous economic shocks including, *inter-alia*, such as exchange rates volatility, shocks in demand and supply, swings in world output, geopolitics, global trade imbalances and global crisis.

1.2 The COVID-19 pandemic has deeply impacted the world. People are living differently, buying differently and, in various ways, thinking differently. Since the pandemic outbreak, institutions across the globe have been actively monitoring different markets and investigating businesses for charging excessive or unfair prices (e.g. price gouging²), by reviewing the challenges of bringing exploitative pricing cases and analysing possible regulatory alternatives. The abrupt disruption triggered by the pandemic has resulted in difficulties in the production and distribution of a number of essential goods, which has in some cases led to shortages – either because of increased demand, inadequate production (e.g. factories unable to open), panic buying, difficulties in distribution of products following confinement measures, or any other trade and macro-economic reasons.

1.3 Pricing of most goods in Mauritius are determined and influenced by market forces though there is also price control on a selected number of products in accordance with the Consumer Protection (Price and Supplies Control) Act. The Ministry of Commerce and Consumer Protection aims at ensuring that consumers are well protected for the purchase of a selected number of items of regular consumption, and preventing traders from profiteering. In face of the pandemic crisis, more specifically as from Sunday 26 April 2020, the Ministry controlled the prices of additional basic commodities and sanitary products in a bid to prevent profiteering and hoarding. Those additional basic commodities included rice, cereals, butter, cheese, pasta products, and pulses, certain sanitary products like baby and adult diapers, sanitary towels, and washing products

1.4 Fluctuations in the price level of basic commodities create uncertainty in the economy, rendering decision-making and forward planning by consumers, businesses, and government

1 Strategic Plan for Food Crop, Livestock and Forestry Sectors 2016-2020.

2 It occurs when a seller increases the prices of goods, services or commodities to a level much higher than is considered reasonable or fair.

difficult. A stable price level is an important condition for promoting a healthy macroeconomic environment which is conducive to economic growth.

1.5 During the period March 2020 to June 2020 (lockdown period), the Consumer Affairs Unit has contravened more than 1,400 traders and some of the contraventions were meant for excessive pricing. In the same vein, it is important to analyse the causes of any price increase or excessive prices of basic commodities.

Objectives and Scope of the report

1.6 The objectives of the study are two-fold. Firstly, the study aims to explore the evolution of prices of basic commodities over the Covid-19 period, and secondly, to analyse the different causes of the price fluctuations of some selected basic staples on the local market.

Structure of the report

1.7 The report is structured into 10 sections and is as follows:

- Section 1 and 2 describe the problem statement and show an overview of the impact of the Covid-19 in some other countries.
- Section 3 and 4 highlight possible causes of price fluctuations and describe the methodologies used to analyse the different possible causes of price fluctuations.
- Section 5 demonstrates the price evolutions from January to August 2020.
- Sections 6, 7 and 8 provide an in-depth analysis of the effects of exchange rates, freight cost, and market supply on the movement of retail prices of basic commodities.
- Section 9 analyses the presence of abusive pricing and unfair practices during the period of study.
- Section 10 shows an overview of the expected price evolution for the short term
- Section 11 provides conclusive remarks and recommendations.

Section 2: Covid-19 and Price Movements- An International Perspective

Country	Impact of COVID-19	Key Measures	Impact on Price
Seychelles	<p>Given that about 30 percent of the GDP directly or indirectly relates to tourism sector, the disruption to global tourism had an adverse impact on the economy.</p> <p>Inflation has been contained so far as lower oil prices offset the impact of a depreciating rupee and supply side disruptions.</p>	<p>Measures to subsidize wages for companies facing distress caused by COVID-19. A revised budget was approved in late April.</p> <p>The Central Bank reduced the policy rate by 100 bps to 4 percent on March 23.</p>	<p>The Consumer Price Index in Seychelles increased to 113.88 points in August 2020, from 111.87 in September 2019.</p> <p>Comparing year on year, this represents an inflation rate of 1.80%.The trend for CPI is showing a gradual increase, thus explaining the impact on the price of the basket of goods.</p>
India	<p>The economic impact of COVID-19 has been substantial and broad-based. GDP contracted sharply in 2020 (-23.9 percent year-on-year) due to the unprecedented lockdowns to control the spread of COVID-19.</p>	<p>The Prime Minister of India declared a COVID relief package of INR 20 trillion.</p> <p>Additional support to farmers as well as a credit facility for street vendors.</p> <p>About two-thirds of population to be covered under the Food scheme.</p>	<p>The price of the hypothetical basket of goods in India has also been on an increasing trend since March 2020.</p> <p>The price of essential goods, particularly food and grocery, has gone up 1.5 times, from Rs 650 in early March to more than Rs 900 presently</p>
South Africa	<p>The South African government has introduced unprecedented measures to assist South Africa in its fight against COVID-19; including a nationwide lockdown. The lockdown was partially eased from 1 May 2020, eased further from 1 June 2020 and eased again with effect from 18 August 2020.</p>	<p>The Reserve Bank cut the repo rate from 6.25% to 3.50% on 24 July 2020.</p> <p>Assist local SME's in supply value-chains in offering working capital, stock, bridging finance, order finance and equipment finance, etc</p>	<p>The price of a basket of good in South Africa in March 2020, calculated by its CPI was measured at 115.6 points.</p> <p>With lockdown restrictions and government incentives, the CPI showed a gradual increase before again increasing to 116.6 points in August 2020, thus representing an inflation rate of 3.1%.</p>
United Kingdom	<p>Monthly gross domestic product (GDP) rose by 6.6% during July 2020 but was 11.7% below February 2020 levels. The economy is in a technical recession after Quarter 2 (Apr to June) 2020 saw a record fall of 20.4%, following a significant shock since the start of the coronavirus (COVID-19) pandemic; this follows a fall of 2.2% during Quarter 1 2020</p>	<p>A number of economic support measures were introduced, namely Job Retention Scheme, Coronavirus Business Interruption Loan Scheme for smaller businesses, and Self-Employment Income Support Scheme</p>	<p>The Consumer Prices Index 12-month inflation rate was 0.5% in August 2020, down from 1.1% in July 2020.</p> <p>Compared to other countries, UK prices for commodities fell over the last couple months.</p> <p>The CPI for the month of March 2020 was 108.6 points, falling to 108.4 in June 2020. This is explained by the fact that price were slashed in the UK to ensure survival for small retail shops</p>

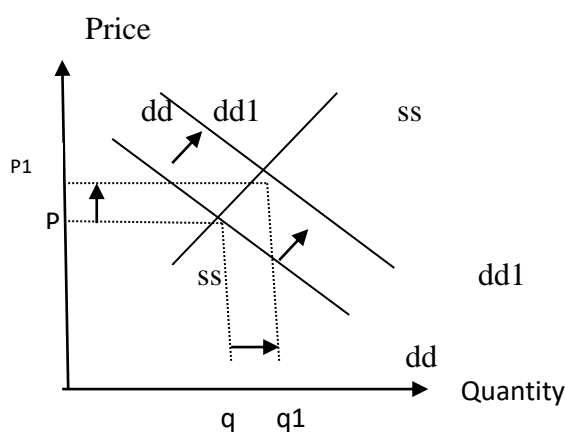
Section 3: Possible Causes of Price Fluctuations

3.1 In Keynesian economic theories and analysis³, the mechanism underlying the price determination of goods is given by the interaction of its supply and demand towards the market equilibrium. The Covid-19 pandemic has caused brutal disruptions on different markets (capital, labour and goods) and fluctuations in prices are not isolated effects, but are rather influenced by an armada of market combinations (OECD, 2020). Economic theorists believe that market factors and non-market factors are the possible causes of price fluctuations during the pandemic like demand shocks, disruption in the production and supply chain (e.g. factories unable to open) or exploitative pricing strategies. This section provides an overview of the most common causes of price fluctuations in the price of goods during the pandemic.

Panic Buying

3.2 During the COVID-19 pandemic, the world has witnessed a denaturing in the consumption pattern of many customers, which can be attributed to the ambiguity of the market effects, the fear of the shortage of goods in retail outlets and due to knightian uncertainties⁴, Baddeley (2020). Consumers tend to stock piles of food staples and basic necessities at their homes due to the fear that these products will not be available in the near future Lucy (2020) and Yap (2020). As shown in figure1 below, panic buying has an adverse effect on price as it shifts the demand consumption pattern from dd to dd1 leading to a price rise from P to P1.

Figure 1: Shift in demand due to panic buying



3 Proponents of perfective competitive markets and rational expectations

4 unprecedented events and not solvable by reference to conceptions of risk measured in terms of the frequency of previous similar events

Fluctuations on the exchange rate market

3.3 Most of the Mauritian imports are paid in hard currencies (e.g. US dollar, Euros and Pounds). Major changes in the prices of the foreign currencies have substantial effects on the prices of the imported goods. It has been observed that foreign currencies have appreciated vis-a-vis the Mauritian Rupee by more than 7 per cent as from February 2020. This implies that when the local currency depreciates vis-a-vis the major traded currencies, importers have to buy foreign currencies at a higher price to pay to those suppliers of goods. Subsequently, these inevitably lead to the higher import prices, which is normally passed on to consumers.

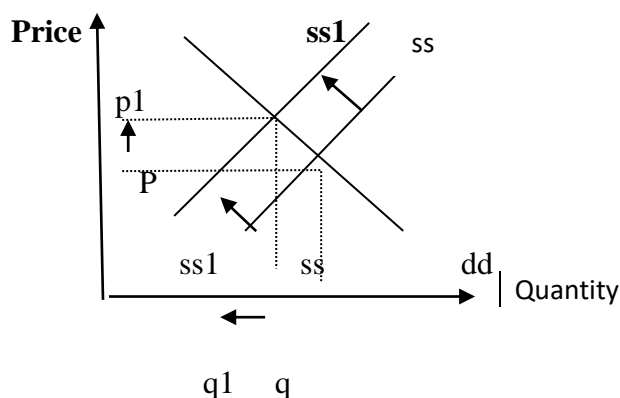
Rise in the cost of freight

3.4 Mauritius is a net food import economy and the cost of freight is a major element which has to be taken into account in determining the price of imported goods. During the pandemic, some shipping lines companies have diminished their activities as international borders have been locked or restricted. Such actions have an effect of causing a major fall in revenue of those shipping lines companies. To cover such losses, shipping lines companies therefore increased the cost of freight and as a result, the price of imported goods rose.

Reduction in production

3.5 The Covid-19 pandemic and confinement obligations in many countries led to a decreased international production, and resulted in a prolonged closure of many production plants. Consequently, these have led to global supply shocks across the supply chain. From Figure 2 below, the supply shock is demonstrated by a fall in the supply curve from SS to SS1. The increase in the price of commodities is shown by an increase from P to P1

Figure 2: Shift in supply due to reduction in production



Hoarding

3.6 Hoarding is a common example of exploitative pricing strategy involving the purchase of large quantities of a commodity by a speculator with the intent of benefiting from future price increases. It is an undeniable fact that the prime motive of businesses in Mauritius is to maximize profits. Hence, assuming low storage cost, the Covid-19 may have presented an opportunity to build up stock of goods so that they can sell them at relatively higher prices in order to generate abnormal profits/windfall gains, Baddeley (2020).

Profiteering

3.7 Profiteering is the act or activity of making an unreasonable profit on the sale of essential goods especially during times of emergency. During the Covid-19 period and due to panic buying, it has been observed that consumers have been rushing to supermarkets and retail stores to buy goods of basic necessities and staples. During that period, consumers bought goods that were available on the stalls with limited choices as goods were scarce. Thus, such situation created an opportunity for traders to increase price to maximise windfall profits.

3.8 Recently, in South Africa, the government issued regulations that prohibit an excessive price under the Competition Act for certain essential goods and services, ranging from foodstuff and medical supplies to face masks and surgical gloves. During the State of National Disaster, a price is regarded as excessive if it is higher than the price set prior to March 2020, unless it corresponds to higher costs of production. The South African Competition Commission referred its first COVID-19 price gouging case to the Competition Tribunal, concerning companies inflating the prices of facemasks. The Competition Commission also announced that it had concluded other investigations that it will refer to the Tribunal soon, into increases in the price of surgical gloves, facemasks, hand sanitiser and even chickens.

Rise in the cost of raw materials for Local producers

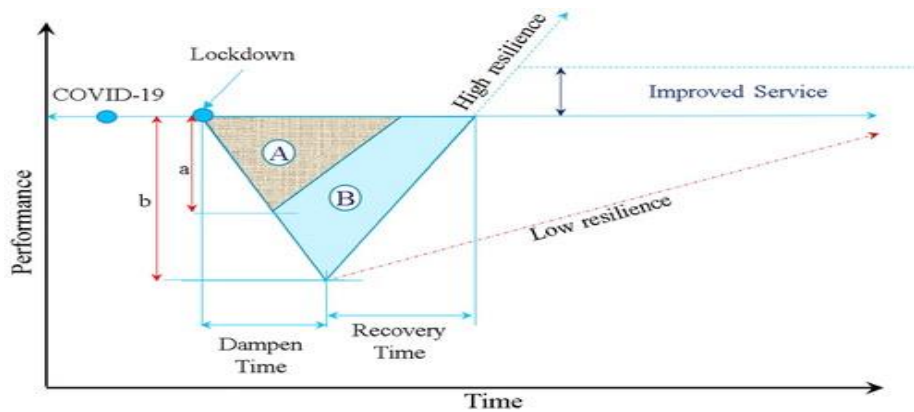
3.9 Local manufacturers need raw materials and other inputs for the production of their goods and most of the raw materials are being imported from overseas. Due to closure of borders during the last few months, many suppliers of raw materials may have increased their prices of goods. Prices of raw materials have increased due to fluctuation in exchange rate and the cost of freight. Companies may face significant disruptions in their inputs, which can increase their costs and concomitantly their prices (OECD, 2020).

Restricted labour mobility and Resources

3.10 Labour is assumed to be a homogenous and mobile resource input that can be used in either of two sectors, manufacturing and food production, Zhong et al. (2007). During the Curfew period, many local manufacturing companies had to apply for Work Access Permits (WAPs) on behalf of employees so that employees could continue working in the production plant. Those WAPs were being delivered by the Commissioner of Police, and many had to wait for the WAPs to be issued in order to start production, which may have caused delays in the production and supply chain. Hence, the production capacity was reduced resulting in an increase in prices.

3.11 The supply chain expenses play an important role in the cost of the final product and an efficient supply chain or distribution system have lower cost of production compared to a disrupted supply chain, Singh (2020). A highly efficient supply chain resilience prevents any disruption in the supply chain through the normalization of the logistics and distribution service. Figure 3 below shows the supply chain resilience triangle in a market. The figure depicts the resilience time with respect to a pandemic such as COVID-19. Low resilience is equal to longer recovery time in the supply chain, and a high resilience is adapting to the pandemic, thus reducing the recovery time in the supply chain.

Figure 3: Supply Chain Resilience Triangle



Source: Singh et al. (2020)

Section 4: The Hypothetical Basket of Goods and Methodologies

4.1 The report makes use of a handful of mathematical techniques and econometric modelling in order to analyse the effects of the different possible causes of price fluctuations during the pandemic as outlined in the previous section. The study uses a panoply of information and variables (independent, endogenous or contemporaneous) which has been controlled for statistical biases. In addition, a hypothetical basket of goods has been designed to analyse the isolated effects of the causes that explained the movement in the retail prices.

The Hypothetical Basket of Goods

4.2 A basket of goods has been designed to reflect the evolution of prices on a fixed set of consumer goods and it reflects mostly foodstuff and non-alcoholic beverages. The basket of goods is composed of 32 distinct groups of products with 2-3 brands for each group. The hypothetical basket of goods is listed in Part A of the Appendix.

4.3 The prices of each group of products have been collected by the Officers of the Consumer Affairs Unit (CAU) from 4 major retail chain companies, namely: Winner's, Super U, LondonWay and DreamPrice. The prices were collected and compiled for the period January 2020 to August 2020.

4.4 Compared to the basket of goods designed by the Statistics Mauritius which is used as a measure of the inflationary effects on consumer prices (e.g. computation of the Consumer Price Index), the hypothetical basket of goods is not statistically suitable⁵ to compute and analyse the inflationary effects based on a hypothetical "price index". Thus, the prices of goods are analysed individually and in aggregate.

4.5 The fundamental techniques, estimation strategies and analysis used in the study are based on a number of underlying assumptions including, inter-alia, the following:

- *Rational consumer behaviour and rational market expectations;*
- *Profit maximisation;*
- *Household comprising of 4 persons;*
- *perfect information across the markets; and*
- *Markets are in equilibrium and operate in perfect competition.*

⁵ Given the characteristics of the products composition of the basket of goods, it can be composed of inter-alia, the following statistical biases: selection biases, anchoring, attribution bias, reporting bias and substitute biases.

Exchange Rate and Prices Volatility

4.6 The first possible cause put forward to explain the price changes in retail outlets is the movement in the exchange rate. The appreciation of foreign currencies vis-à-vis the Mauritian Rupee increases the prices of imported final goods and raw materials and the price increase is expected to pass-through to the consumers. In order to analyse the impact of the appreciation and examine the degree of the pass-through on the prices at different stages in the distribution channel (from importer to distributor/manufacturer to customer), a Vector Autoregressive (VAR) model and the dynamics multipliers are used.

4.7 The VAR allows the estimation of several equations in one single system and allows the estimation of the relative pass-through via a series of prices such as import prices, producer prices and consumer prices. The VAR model incorporates the lagged integrations (such as expectations of the variables) between the prices which allow the volatility of import prices to pass-through to producer prices and pass-through to consumer prices. The model also allows for the quantification of shocks such as abnormal market disturbances [*See Part B in Appendix for more details on the model, data, variables and the estimation strategy*].

4.8 The Impulse Response functions (dynamic multipliers) are used to describe the evolution of the price variables along a specified time horizon after a shock in the exchange rate. Moreover, it allows the estimation of the degree of the changes in the prices while taking into considerations other elements that influence the prices following the exchange rate shocks.

Freight Costs and Impact on Prices

4.9 The increase in freight cost is another possible cause that influenced the increase in the retail prices over the last periods. Any increases in freight cost⁶ can be attributed to exogenous and contemporaneous factors including inter-alia, oil prices, demand for shipping services, distance, and infrastructure (UNCTAD, 2014).

4.10 In order to estimate the effects of the increase in the prices of freight on the retail prices, the same methodology and estimation technique adopted in the analysis of the movement in the exchange rate on consumer prices has been used [*See Part C in Appendix for more details on the model, data, variables and the estimation strategy*].

⁶ For the purpose of the study, other costs such as custom clearance fee, handling fee, storage and demurrage fee, verification and inspection fee, amongst others, are excluded.

4.11 Transport cost can be segregated into direct cost and indirect cost. The direct cost of transport includes freight charges and insurance while indirect cost consist of holding cost, preparation cost associated with the loading of containers, inventory cost, storage cost, amongst others (D.Sinah, 2011). Hummels (2010) pointed out that shipping cost is not an exogenous factor and is dependent on the price of goods and other factors such as distance, port efficiencies, among others. He further argued that the higher the value of goods, the higher will be the shipping cost as it requires more insurance premium and more handling fee.

4.12 Freight is the price charged by transport carriers for the transportation of goods from one source location to another destination location and one of the exogenous factors affecting the cost of freight is the changes in oil prices. Freight charges depend on the mode of transport (air, sea or road), the nature or form of cargo (loose cargo, containerised cargo, frigorific containers, amongst others), the weight and volume of the cargo and the distance between the source destination and delivery destination.

4.13 In addition, the isolated effects of the fluctuations in freight cost are analysed in the hypothetical basket of goods as described previously. The objective of this technique is to analyse how the prices of selected goods in the hypothetical basket responded to any changes in freight paid by the importers over time.

Shortage of Basic Commodities on the Market

4.14 In order to assess whether there was any short supply of basic commodities on the market, the hypothetical basket of goods has been used as a conduit to analyse the volume of the basic commodities and staples available on the market and the fluctuations of prices.

4.15 The volume imported for each commodities are analysed and the correlation coefficient⁷ is used to assess and quantify the relationship between prices and the volume available on the market of the basic commodities.

⁷ Correlation coefficient is a statistical measure of the degree of linear association between two continuous variables which provide an indication of the direction of the relationship (positive v/s negative) and the degree of the change between the two variables (Strong v/s weak)

Demand Shocks (Panic Buying)

4.16 The impact of demand shocks on price fluctuations for the basic commodities were analysed and assessed based on the information requested in relation to sales and stock level of each commodity. The data was provided by the major retail chain companies.

4.17 Long and Khoi (2020) modelled the causes of hoarding and found that hoarding occurs when the consumers have a risk perception whereby they use their emotions to assess risk, motivate action and focus their thinking. The risk perception has a positive effect on the attitude of consumers in the plan to hoard food and subsequently, the attitude positively influences the Perceived Behaviour of consumers in the plan to hoard food.

4.18 Using the same statistical measure, i.e., correlation coefficient, the existence of a linear relationship between the stock level, sales and retail prices was computed and analysed. In other words, the objective is to observe whether the increase in the sales volume of the basic commodities in the retail stores led to the increase in the selling prices of those products.

Unfair Price Practices by Retail Stores

4.19 One of the common examples of unfair price practices is the charging of excessive prices during the times of limited inventory (exploitative pricing). According to OECD (2020), a retail outlet will charge exploitative prices when there is a situation of market power. In other words, when there is a low inventory for a particular product, the retailers will tend to increase the price as the retailers have more bargaining power.

4.20 Using the information provided by major retailers on stock level and the selling prices for each commodity over a definite period, the relationship between the movement of selling prices and the inventory levels for each product can be assessed to see whether there is any form of exploitative pricing for those products which were in a situation of low inventory.

Section 5: Price Movements during COVID-19 Period

5.1 This section studies the evolution of retail prices for the period January 2020 to August 2020. The hypothetical basket of goods is used as the basis to demonstrate and evaluate the price changes. The prices of the selected products in the basket of goods have been made available by the 4 retail chain companies [See Part D in Appendix for the retail prices for the selected goods in the hypothetical basket of goods].

5.2 Table 1 below, demonstrates the price changes for the selected goods and it is noted that in all the four retail chain companies, for some imported products, prices have increased about 1.21% , especially during the COVID-19 period⁸. The products showing increase in prices include milk, imported edible oil, cereals, black lentils, corn mutton, sardines, canned tomatoes, fruit juice and home cleaning products.

Table 1: Changes in retail prices for main selected products

	Feb-20	Mar-20	Apr-20	May-20	June-20	July-20	Aug-20
	% Change	% Change	% Change	% Change	% Change	% Change	% Change
Basmati Rice	-0.08	1.83	4.47	-6.41	-15.77	1.67	-0.66
Flour	0.49	2.96	0.00	0.47	0.00	-3.34	0.00
Edible Oil	1.81	0.84	5.73	-2.34	0.59	-1.41	0.00
Butter	-0.99	0.47	1.92	-2.61	-6.62	5.30	3.91
Cheese	0.24	0.22	1.53	-1.63	-3.32	2.32	6.93
Powdered Milk	0.59	1.67	9.78	0.84	0.64	-0.29	-1.15
Cereal	2.34	1.94	1.15	0.00	-15.83	13.09	5.28
Macaroni	-5.33	5.68	5.09	-23.52	-7.66	12.24	6.98
Spaghetti	5.14	-7.84	13.70	-2.08	0.55	0.92	-0.91
Black Lentils	6.48	8.39	12.07	3.32	0.80	0.61	-1.66
Corn beef	-0.52	1.28	1.20	-1.24	-1.36	0.95	16.83
Corn Mutton	0.06	5.29	3.15	0.70	6.27	4.89	2.81
Sardines	0.00	0.15	6.21	2.34	0.00	0.00	0.00
Tomatoes whole	-0.13	5.48	4.03	5.42	0.92	1.63	-1.82
Fruit Juice	-1.25	2.58	3.21	-1.56	21.57	3.22	1.02
Washing liquid detergent	-1.09	3.81	9.36	-10.82	4.79	-5.43	6.09
Toothpaste	1.71	-3.51	3.85	-2.75	-1.45	1.90	3.51
Toilet soap	-3.49	4.39	1.57	-3.92	4.55	-1.41	-0.08

⁸ The Interpretation and General Clauses Act has been amended with effect from 23rd March 2020 defining the “COVID-19 period” as the period starting 23rd March 2020 and ending 01st June 2020.

Home cleaning	-3.56	1.70	5.17	0.21	-2.52	2.58	3.43
Tissue Paper	2.49	-3.96	4.12	0.00	-0.45	-0.22	3.88
Sanitary Pads	-0.33	0.28	6.73	-1.91	-13.66	0.21	0.00

5.3 It is also intuitive to analyse the price movements for those products from the hypothetical basket of goods that are manufactured locally. Table 2 below shows the price changes for the locally manufactured products and it is observed that for the month of April, the locally produced product had an increase in the retail prices by 2.54%. The locally manufactured comprises sanitary pads (Talia), edible oil (Rani), laundry powder, tissue paper, tea and sugar. However, it is observed that after month of April, the average prices of locally manufactured products fell and increased again in the months of July and August. *[See Part E in Appendix for the retail prices for the selected locally manufactured products].*

Table 2: Changes in retail prices for locally manufactured products

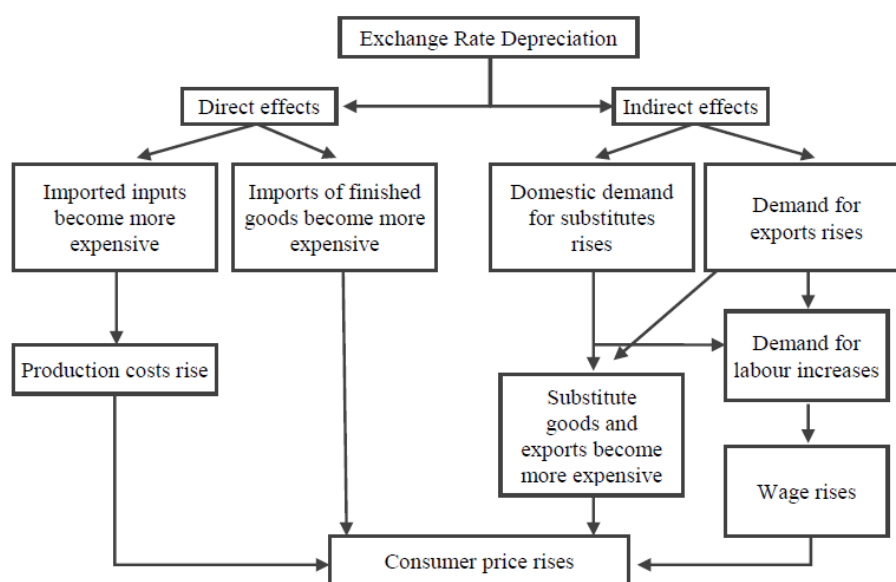
	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20
	%change	%change	%change	%change	%change	%change	%change
Sugar	0.00	0.00	1.35	0.00	-0.52	0.00	0.00
Edible oil	3.75	-3.64	4.93	-2.50	-0.56	0.00	0.00
Tea	0.67	0.55	2.26	-0.62	-0.62	-0.19	-0.12
Macaroni	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Canned peas	-1.00	1.01	-0.18	1.53	0.00	0.00	2.32
Frozen chicken	0.00	0.00	0.00	0.20	-4.03	4.20	2.80
Laundry powder	0.00	0.00	4.20	-1.44	1.47	-2.37	0.67
Toilet soap	-3.50	4.40	1.55	-3.75	4.53	-1.39	-0.10
Tissue paper	2.49	-3.96	4.12	0.00	-0.45	-0.22	3.87
Sanitary pads	0.00	0.58	5.46	-4.00	-15.70	0.30	0.00
Total	0.41	-0.26	2.54	-0.85	-1.19	0.13	1.19

Section 6: Foreign Exchange and Price Movements

6.1 Amidst the impulses that exchange rates transmit to the Mauritian economy, the effects of the exchange rate are a paramount economic factor that affects the trade activities and the cost of imports. The exchange rate volatility has a cascading pass-through along the two stages in the distribution and consumption channels i.e. stage one pass-through is from the importer to the wholesaler and stage two pass-through is from the wholesaler to the customer (Faruquee, 2004).

6.2 Figure 4 below shows the different channels that act as the conductor for exchange rate pass-through. Exchange rate volatility has both direct and indirect impacts on the distribution channel. The direct effects of a depreciation of the currency are transmitted from the rise in the cost/prices of imports which lead to higher production cost and consumer prices. On the other hand, the channel through which the indirect effects of a depreciation of the currency is complex. Any depreciation will generally lead to a rise in the demand for substitutes, thus leading to higher prices due to the higher demand. In addition, exports of goods will rise which lead to more demand for labour and wages, which will lead to higher consumer prices.

Figure 4: Transmission channels of exchange rate depreciation to consumer prices



Source: Lafleche (1996)

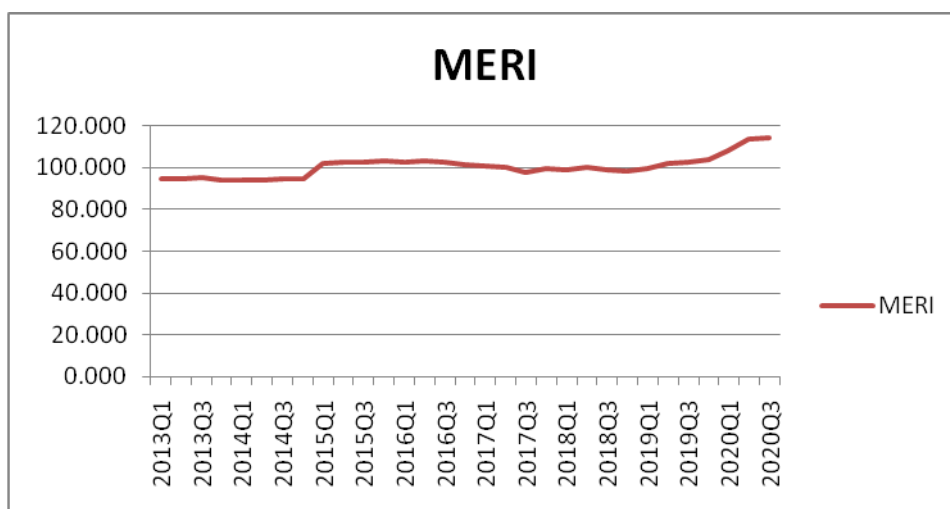
6.3 An exchange rate pass-through along the distribution channel is considered “complete” when the changes of the exchange rates are fully absorbed in the import prices. That is, when a one percent change in the exchange rate results in a one percent change in the import price.

“Incomplete” or “Partial” is when the import prices exchange rate pass-through did not respond to changes in exchange rates or responded less than the change in exchange rates, Moldasheva (2013).

6.4 Several studies found that exchange rate shocks are likely to impact largely on the import prices (Campa and Goldberg, 2005, Campa et al., 2005, Feinberg, 2008 and Gaulier et al., 2008) than on producer prices (Feinberg, 1989, Feinberg and Kaplan, 1992 and Feinberg, 1996) and consumer prices (Campa and Goldberg, 2006, Frankel et al., 2005, Hellerstein, 2006, Ihrig et al., 2006 and Mishkin, 2008). The reasons advocated to the low pass-through to the retail prices were due to competition in the retail sector and relatively lower cost added in the distribution sector (between 40 and 60 percent).

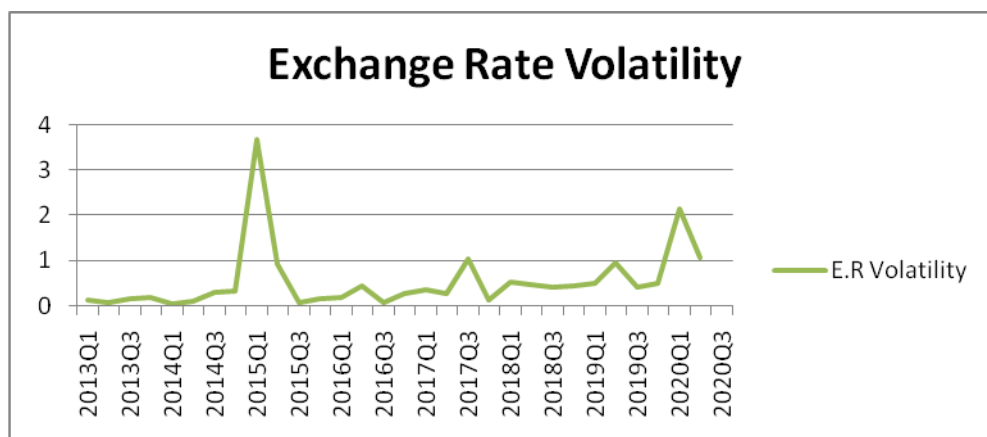
6.5 Figure 5 below depicts the evolution of the Mauritius Exchange Rate Index (MERI) over the last 31 Quarters. The MERI is the weighted average of bilateral exchange rates for the Mauritian rupee vis-a-vis the currencies of the important trading partners. An increase (decrease) in the index indicates depreciation (appreciation) of the Mauritian Rupee. It can be observed that from the third Quarter of 2019, the exchange rate index showed that the depreciation of the local currency rose at an increasing rate to reach an index of 114 (11.7%) compared to 102 in third Quarter 2019, with a drastic increase in the exchange rate volatility as shown in Figure 6.

Figure 5: Mauritius Exchange Rate Index (MERI)



Source: Bank of Mauritius

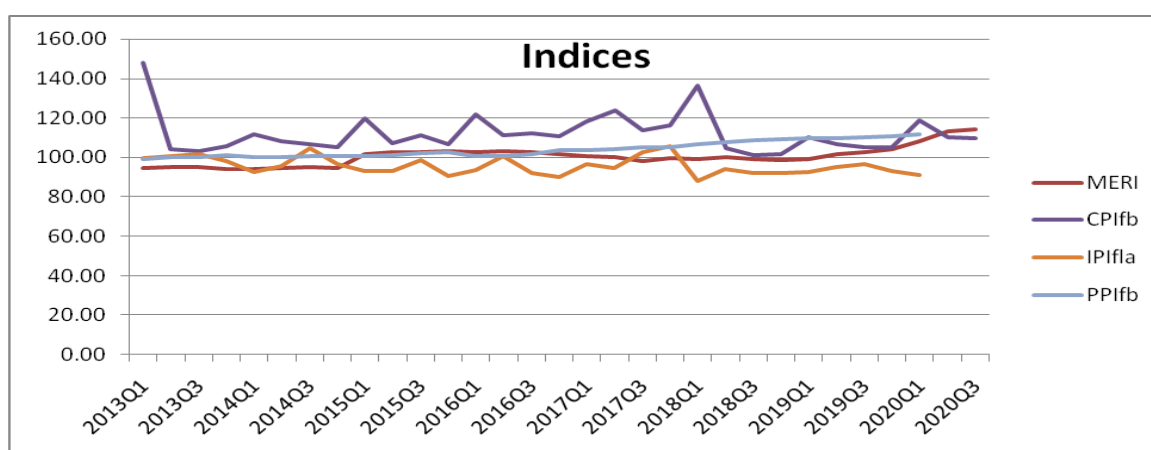
Figure 6: Mauritius Exchange Rate Volatility



Source: Bank of Mauritius

6.6 Figure 7 below shows the evolution of the different indices: MERI, Import Price Index for food and live animals (IPIfla), Producer Price Index for food and non-alcoholic beverages (PPIfb) and the Consumer Price Index for food and beverages (CPIfb) over time. As shown in the Figure below, a weak divergence (a weak negative relationship) is noted between the evolution of the exchange rates and the IPIfla, which implies that the increase in prices resulting from the depreciation of the local currency does not necessarily increase the import prices. The PPIfb and the CPIfb displayed a positive relationship with the movement of the MERI. The relationships indicate that as the movement of exchange rates increase positively (depreciation of the Mauritian Rupee), the increases in prices are transmitted to through the PPIfb and CPIfb.

Figure 7: Movement of the Indices



Source: Statistic Mauritius

6.7 The evolution and trend of the different indices are partially or completely affected by different external exogenous shocks such as price of oil (transport cost), demand and supply shocks, monetary policy amongst others and these external shocks are transmitted across the different stages of the distribution channel, Mann (1986). Therefore, it is imperative to assess the responsiveness of the movement of the exchange rates in the distribution chain on the domestic retail prices and the degree of the change in prices over the distribution channel (the exchange rate pass-through).

6.8 As discussed in Section 4, the effect of the exchange rate pass-through is analysed using econometric modelling to assess the degree and extent of the exchange rate effects through prices across the stages of the distribution channel i.e. the effect of a change in exchange rate and the impact prices from import to consumers. Using the VAR model and the impulse response functions, it has been observed that the pass through of the exchange rate shocks is borne by the consumers with time. From figure 8 below, it can be observed that the pass through of the exchange rates are incomplete, i.e., the consumers do not pay for the full shock in the exchange rates. Over the 10 quarters, it can be analysed that the import prices of food (IPIfla) increased with a percentage depreciation of the Mauritian Rupee (i.e. import prices increased by 10.38% as a result of an increase (depreciation) of the exchange rate index).

6.9 The exchange rate pass through to the consumer prices (CPIfb) is lower than the pass through of the import prices. Over the 10 quarters, the pass through of the increase in exchange rate index (one percent depreciation) is 2.17%, which is considerably lower than the import prices. This can be explained by the fact that the market for the foodstuff activities is highly competitive and importers tend to absorb the exchange rates shocks in order to maintain competitiveness and market share. In addition, the importers have also adjusted their mark-ups in order to prevent the burden to be passed on to the consumers. The presence of high substitution effects may have forced the importers to absorb the exchange rate shocks instead of increasing the prices of the imported products.

6.10 The exchange rate pass through of the shocks are not absorbed by the producer/manufacturers (PPIfb). Despite that, in the short run, the producer prices showed an increase in prices of 0.72% to 0.14%, in the long run i.e. in the 10 quarters, it can be seen that the pass through effect is negative (zero). It is explained by the fact that the roles of local producers/manufacturers⁹ using the imported foodstuffs are insignificant in the absorption of

⁹ Local producers/manufacturers/wholesalers are assumed to import foodstuff for repacking, reprocessing, blending amongst others (intermediary activities).

the exchange rate shocks. In other words, the importation and sales of foodstuffs flow through a direct channel of distribution whereby there are negligible intermediaries such as local manufacturers/producers.

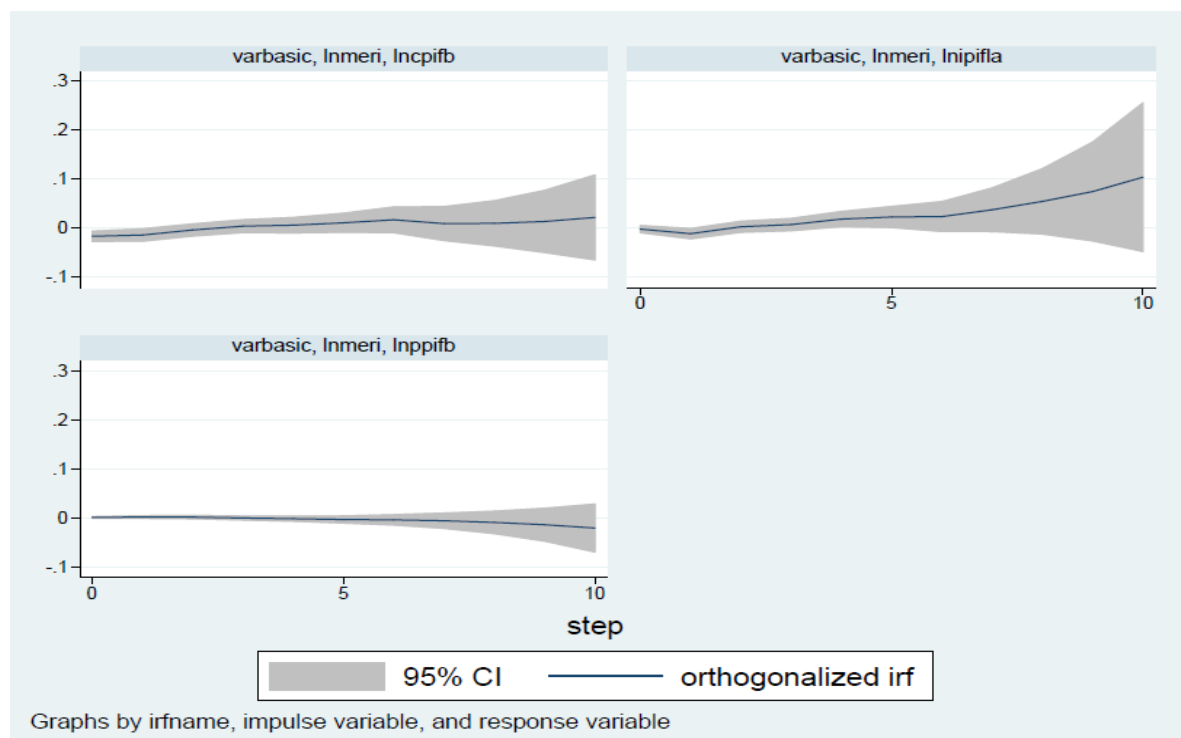
Figure 8: Exchange rate pass through elasticity to import and retail prices



6.11 Figure 9 shows the graphical responses of different prices following the shocks in the exchange rates (of a percentage depreciation in the exchange rates). Similar to the findings of Bhundia (2002), Faruqee (2006) and Sek and Kapsalyamova (2008), it can be observed that the responses of the imported prices of food increased steadily as from five quarters and on the other hand, the consumer prices of foodstuffs increased at a diminishing rate as the shocks were absorbed by the importers. The importers are more impacted by the depreciation of the Mauritian Rupee compared to the consumers.

6.12 As mentioned previously, the changes in the prices of the producer prices for foodstuffs did not increase and remained stable and thereafter even decreased which confirmed that the presence of intermediary activities is insignificant in the channel of importation and sales of products. In addition, the insignificant pass through at this stage may be explained by the fact that intermediary firms may anticipate that the depreciation would have a temporary impact (non lasting), thus they adjusted their prices by a negligible amount which lead to a zero pass through from the intermediaries to the consumers.

Figure 9: Exchange rates impulses and the responses of different prices



Irf: Impulse Response Function

Exchange Rate Movements and the Hypothetical Basket of Good

6.13 The movement in the exchange rates have effects on the hypothetical basket of goods. As per table 3 below, from January to August 2020, the exchange rate index displayed an increase from 104.134 to reach 114.828 in August 2020, indicating that over the eight months, the Mauritian Rupee has been continuously depreciated against other traded currencies. The Mauritian Rupee depreciated about 2.70% from the month of March to April 2020 and the abrupt fall in the Mauritian Rupee was reflected on the value of the hypothetical basket of goods in the same month.

6.14 The value of the hypothetical basket of goods continued to increase smoothly, until an abrupt increase in the value of the goods was observed in the month of April 2020, whereby the value of the goods increased from Rs 3,342.26 to Rs 3,500.45. Subsequently, the value of the basket of goods decreased to reach Rs 3,469.67. The degree of movement between the exchange rates index and the value of the hypothetical basket of good is positively related and it has been estimated to have a correlation of 0.7, i.e., as the exchange rates depreciate, the value of a hypothetical basket of goods tend to increase.

6.15 In addition, it can be observed that 1% change in the MERI (1% change in the depreciation of the Mauritian Rupee) led to a variation of effects on the value of the basket of goods. The relative change in 1 percent change in the MERI led to an increase of 0.20% and 1.76% in value of the hypothetical basket of goods for the months of March and April, respectively. For the months of May and June the effects of the change in MERI had adverse impacts whereby one percent increases in MERI led the value of the basket of goods to fall by 2.49 % and 2.13%. However, for the months of July and August, value of the basket of goods increased and in August 2020, the increase in the value of the basket of goods due to one percent change in MERI, increased abruptly by 3.65%.

Table 3: Value of the hypothetical basket of goods and exchange rate movements from January to August 2020

Month	January	February	March	April	May	June	July	August
MERI	104.13	105.15	108.24	111.16	112.09	113.29	114.18	114.83
Value of the basket of goods (Rs)	3330.59	3323.16	3342.26	3500.45	3427.73	3349.16	3398.96	3469.67
% Change in value of the basket of goods with respect to a change in MERI	-	-0.23	0.20	1.76	-2.49	-2.13	1.90	3.65

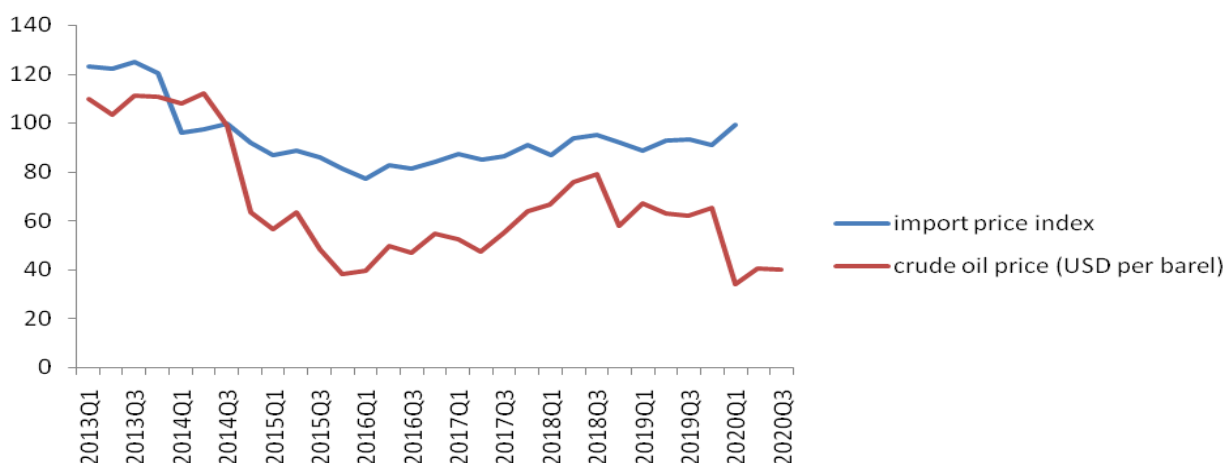
6.16 In sum, exchange rates had an impact on the import prices and the consumer prices of foodstuffs. As from the third quarter 2019, foreign exchange rates had an appreciation vis-a-vis the Mauritian Rupee. It has also been noted that the exchange rate pass through to the consumer prices of foodstuff is lower (2.17%) than the pass through of the import prices (10.38%). In other words, despite the increase in the consumer prices as a result of the appreciation of the foreign currencies, the importers absorbed most of the price increase and transferred only 2.17% to the consumer prices. The selected items in the hypothetical basket of goods have also been analysed and it has been observed that over the period January to August 2020, a 1 percent change in the foreign exchange rates led to an increase of 0.20% and 1.76% in value of the hypothetical basket of goods for the months of March and April, respectively. For the Months of May and June the effects of the change in MERI had adverse impacts on the value of the hypothetical basket of goods. However, for the months of July and August, the value of the basket of goods increased and in August 2020, the increased in the value of the basket of goods was by 3.65%.

Section 7: Freight costs and impact on prices

7.1 Cargo freight rates are dependent on oil prices (Hummels, 2010). For importers, an increase in freight cost creates pressure for addition cost and incentivised the importers to charge higher prices for their imported commodities and the burden of the cost is transferred to the consumers (Sly et al, 2016). The oil prices are used as an indication of the shipping cost albeit of the impacts of other contemporaneous factors that affect the freight cost.

7.2 Figure 10 below shows the evolution of both the prices of crude oil and the evolution of the import price index, which provides an overall measure of aggregate price changes in Mauritian Rupees of goods imported into the country. The figure below demonstrates that as from the third quarter 2014, the movement of both indicators moved together and had a correlation coefficient¹⁰ of +0.80, which implied that any decrease/increase in the oil price will have an 80% proportionate effect on the prices of import prices. However, it can also be observed that in the beginning of year 2020, despite a drastic fall in the oil prices, the prices of import increased. Consequently, the increase in import prices may be explained by other factors such as exchange rates, rise in the cost at source level, rise in landing costs amongst others.

Figure 10: Movement of Crude oil prices and Import Price Index

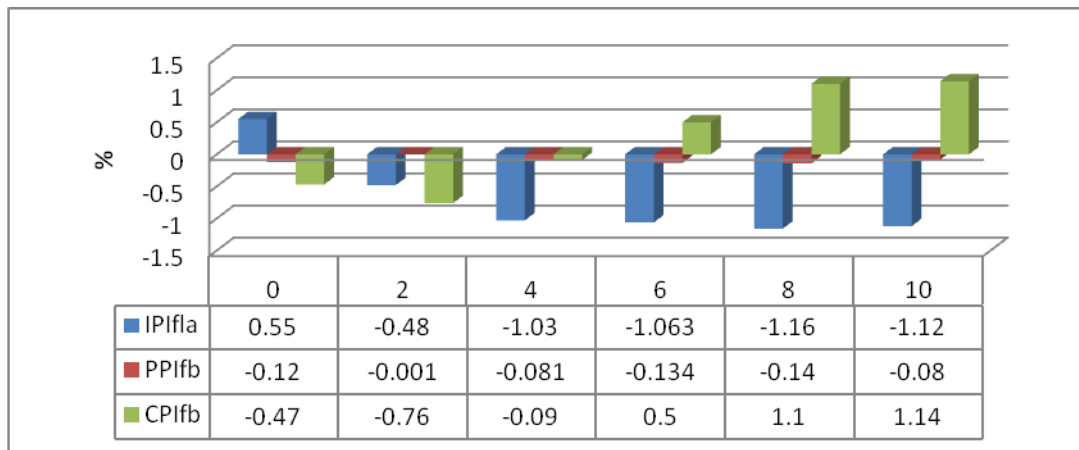


7.3 Anderson and Vanwincoop (2003) studied the impact of trade costs through their effects on trade prices and more generally price indexes. As shown in Figure 9, the changes in the import prices due to the increase in oil prices is expected to have changes in the prices

¹⁰ Correlation coefficient is a statistical measure of the degree of linear association between two continuous variables which provide an indication of the direction of the relationship (positive v/s negative) and the degree of the change between the two variables (Strong v/s weak)

across the distribution channel, i.e., the pass-through of the increase or decrease in the oil prices to the import prices, producer prices and the retail prices. A Vector Autoregressive Model based on the Cholesky decomposition was used to analyse the pass-through effect of the changes in oil prices (shipping cost) on the different stages of the distribution channel.

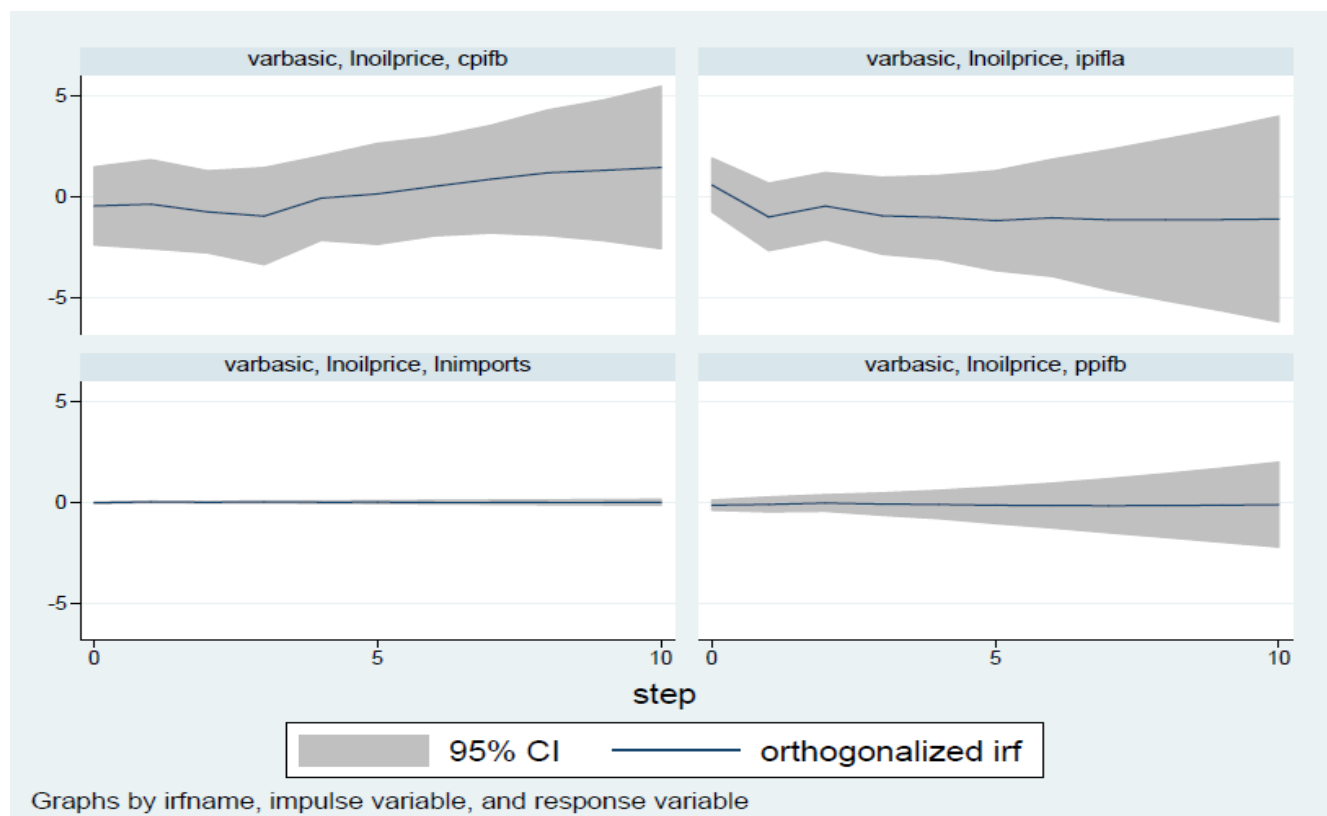
Figure 11: Exchange rate pass through elasticity to import and retail prices



7.4 From the figure above, unlike the findings of the study carried out by Sly et al (2016), it can be analysed that as from the 8 quarters to 10 quarters, there is full pass through of the freight cost (oil prices) on the consumers. The changes in the consumer prices for foodstuff increased more than the one percent decrease/increase in prices. From 10 quarters, given the fall in the oil prices, a one percent decrease in freight cost lead to a fall of 1.14% in prices of foodstuffs which is borne by the consumers. In addition, the cost pass through from the intermediaries to the consumers is insignificant and indicates a zero-pass-through, which is similar to the case of the foreign exchange pass-through.

7.5 Figure 12 below shows the movements of the different prices following the shock in the oil prices. To substantiate the results in figure 11, it can be seen that as from 5 quarters, the prices of the foodstuff that are paid by the consumers fluctuated while the shocks in the oil prices are not absorbed by the importers which is shown with a flat trend. Similarly, the same trend is being observed for the producer prices (intermediaries).

Figure 12: Oil prices impulses and the response of prices



Impact of Freight and Insurance on the Hypothetical Basket of Goods

7.6 The relationship between the freight cost and insurance paid on the goods imported in the hypothetical basket of goods was compiled and analysed. Table 4 below shows the retail prices of the good and the freight and insurance paid per item¹¹.

Table 4: Retail prices and freight and insurance on selected imported goods from January – August 2020

	BASMATI RICE		FLOUR		EDIBLE OIL		MARGARINE		BUTTER		CHEESE		POWDERED MILK	
	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item
Jan	319.99	10	50.74	4.00	43.15	1.88	81.87	2.50	82.14	2.00	71.63	2.75	189.45	3.00
Feb	319.73	10	50.99	4.00	43.93	1.88	78.78	2.50	81.33	1.80	71.80	2.50	190.56	3.00
Mar	325.58	10	52.50	4.00	44.30	2.83	79.73	3.00	81.71	2.00	71.96	2.50	193.74	5.00
Apr	340.13	10	52.50	4.00	46.84	1.88	86.08	3.50	83.28	5.00	73.06	2.25	212.69	3.00
May	319.63	10	52.75	4.00	45.77	2.83	82.91	2.50	81.16	1.80	71.89	2.50	214.50	2.00
Jun	269.23	10	52.75	4.00	46.04	2.83	57.00	2.50	75.79	1.80	69.50	2.75	215.88	3.00

¹¹ The freight and insurance paid were compiled from the MRA Customs and were apportioned as per the weight of each item. The other cost associated with the freight and insurance were excluded.

Jul	273.73	10	50.99	4.00	45.40	2.83	76.47	3.50	79.81	2.40	71.11	2.75	215.25	2.00
Aug	271.92	10	50.99	8.00	45.40	2.83	74.78	5.00	82.93	2.00	76.04	2.50	212.78	3.00
ρ	0		-0.35		0.32		0.06		0.40		-0.55		-0.54	

Sp: Selling Price, IF: Insurance and Freight, P: Correlation Coefficient

	CEREAL		SPAGHETTI		BLACK LENTILS		CORNED BEEF		CORNED MUTTON		SARDINES		CANNED TOMATOES (WHOLE PEELED)	
	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item
Jan	93.55	4.00	50.23	2.50	19.59	2.00	95.45	1.30	101.50	1.36	19.63	0.63	23.57	1.28
Feb	95.74	4.00	52.81	2.00	20.86	1.00	94.95	1.95	101.56	2.04	19.63	0.50	23.54	1.28
Mar	97.60	5.50	48.67	2.00	22.61	1.00	96.17	1.30	106.93	1.36	19.66	0.63	24.83	1.28
Apr	98.72	3.50	55.34	3.00	25.34	1.00	97.32	1.63	110.30	1.70	20.88	0.88	25.83	1.28
May	98.72	4.00	54.21	2.50	26.21	1.00	96.13	1.63	111.08	1.70	21.38	0.50	27.31	1.28
Jun	83.09	4.00	54.51	2.50	26.42	1.00	94.82	1.95	118.05	2.04	21.38	0.63	27.56	1.28
Jul	93.97	4.50	55.01	3.00	26.58	1.50	95.72	1.63	123.82	1.70	21.38	0.63	28.01	1.28
Aug	98.93	5.50	54.51	3.00	26.14	1.00	111.83	0.98	127.30	1.02	21.38	0.63	27.50	1.28
ρ	0.27		0.72		-0.47		-0.72		-0.26		0.13		-0.92	

Sp: Selling Price, IF: Insurance and Freight, P: Correlation Coefficient

	FROZEN FISH		FRUIT JUICE		LAUNDRY POWDER		WASHING LIQUID DETERGENT		TOOTHPASTE		ADULT DIAPERS		SANITARY PADS	
	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item	Sp	IF per item
Jan	206.25	0.00	140.36	3.14	345.10	12.00	289.43	13.46	58.56	0.47	207.42	15.60	36.45	0.95
Feb	213.00	0.00	138.61	3.14	336.60	12.00	286.28	13.46	59.56	0.58	207.42	14.30	36.33	1.12
Mar	206.25	0.00	142.18	4.71	326.25	15.00	297.18	16.83	57.47	1.04	207.42	14.30	36.43	1.12
Apr	213.00	2.00	146.74	6.28	341.63	12.00	325.00	13.46	59.68	0.58	223.24	14.30	38.88	1.29
May	213.00	1.00	144.49	3.14	339.83	15.00	293.28	16.83	58.08	1.16	223.24	14.30	38.15	1.38
Jun	213.00	1.00	175.66	3.14	331.28	12.00	307.32	13.46	57.24	0.70	223.24	14.30	32.94	1.29
Jul	213.00	1.00	181.31	0.70	328.33	12.00	290.64	13.46	58.33	0.81	223.24	16.90	33.01	1.38
Aug	213.00	1.00	183.16	1.57	336.49	12.00	308.33	13.46	60.38	1.16	224.08	15.60	33.01	0.95
ρ	0.65		-0.66		-0.25		-0.21		-0.06		0.19		0.12	

Sp: Selling Price, IF: Insurance and Freight, P: Correlation Coefficient

7.7 From table 4 above, the insurance and freight cost for each item is computed and it can be observed that the freight and insurance cost for the importation of the items have fairly increased over the period of study. The linear association between the insurance and freight cost and the selling prices of those products were computed using the correlation as a statistical

measure. On average, the linear association between the cost and selling prices are quasi inexistent as the average correlation is nearly 0.01, which means that the increase in freight and insurance cost do not have necessarily increased the selling prices.

7.8 For products such as Edible Oil, Butter, Spaghetti and Frozen Fish, it is observed that there is a relatively strong positive linear association with the selling prices. In other words, an increase in the insurance and freight cost led to an increase in the selling price. On the other hand, for the other products, the linear association between the prices and the insurance and freight cost are quasi negative or inexistent, which means that the increase in prices of the goods are not affected by the freight and insurance cost.

7.9 In sum, freight cost (crude oil used as a proxy) affects the value of imports, i.e. a decrease in crude oil prices tends to decrease the value of imports and vice-versa. However, at the end of quarter 1 and 2 of year 2020, it is observed that despite the fall in the price of oil, the value of imports increased. In addition, it has also been analysed that the pass through of any rise in freight cost for foodstuffs are fully transferred to the consumer prices whereby a 1% increase in freight cost will lead to a 1% increase in the selling prices of foodstuffs. On the other hand, while analysing the impact of the freight and insurance cost on the hypothetical basket of goods, it is observed that the freight and insurance cost do not necessarily impacted on the selling prices of the selected items as the selling prices did not fluctuate in response to the changes in the freight and insurance cost during the period January to August 2020.

Section 8: Shortage of goods on the Local Market

8.1 One of the determining factors of price movements is the supply and availability of the commodities. As highlighted in Section 3, any supply shocks such as shortage of goods on the market is likely to increase the prices of the goods. Prices act as a signal to inform suppliers how to respond to the demand of the consumers. In other words, prices inform the sellers whether goods are in short supply or readily available.

8.2 Using the hypothetical basket of goods, the prices and the quantities available on the market of selected imported basic foodstuffs and non-foodstuff were analysed. The relationship between the prices and quantities imported¹² for the selected items were computed. Table 5 below shows the volume imported and prices of selected imported goods.

Table 5: Retail prices and volumes imported on selected imported goods from January – August 2020

	BASMATI RICE		EDIBLE OIL		MARGARINE		BUTTER		CHEESE	
	Volume	sp	Volume	sp	Volume	sp	Volume	sp	Volume	sp
Jan	3,210,409	319.99	1,837,978	43.15	495,172	81.87	81,945	82.14	333,109	71.63
Feb	2,289,414	319.73	1,693,311	43.93	520,721	78.78	170,063	81.33	394,265	71.80
Mar	2,801,638	325.58	6,488,091	44.30	257,856	79.73	72,752	81.71	413,425	71.96
Apr	2,581,569	340.13	1,839,495	46.84	417,916	86.08	98,958	83.28	429,872	73.06
May	8,046,786	319.63	3,368,609	45.77	378,074	82.91	117,182	81.16	469,250	71.89
Jun	4,625,257	269.23	7,225,778	46.04	866,348	57.00	91,483	75.79	212,496	69.50
Jul	1,776,908	273.73	707,176	45.39	508,440	76.47	64,542	79.81	272,511	71.11
Aug	2,521,147	271.92	1,390,873	45.39	532,775	74.78	87,413	82.93	511,022	76.04
p	0.11		0.10		-0.87		0.08		0.84	
	POWDERED MILK		CEREAL		Macaroni + Spaghetti		BLACK LENTILS		SARDINES	
	Volume	sp	Volume	sp	Volume	sp	Volume	sp	Volume	sp
Jan	512,625	189.45	177,123	93.55	235,746	50.23	100,880	19.59	166,773	19.63
Feb	1,342,736	190.56	96,724	95.74	559,820	52.81	419,764	20.86	333,638	19.63
Mar	407,246	193.74	139,112	97.60	200,800	48.67	168,766	22.61	51,985	19.66

¹² Under the assumption that the volumes imported are being put on the market for immediate sales. The data has been provided by the Mauritius Revenue Authority (Customs).

Apr	903,455	212.69	188,364	98.72	383,426	55.34	268,821	25.34	2,453	20.88
May	742,362	214.50	279,558	98.72	477,374	54.21	455,607	26.21	191,076	21.38
Jun	832,881	215.88	173,174	83.09	652,105	54.51	483,445	26.42	264,112	21.38
Jul	714,950	215.25	225,891	93.97	362,951	55.01	521,064	26.58	163,123	21.38
Aug	461,186	212.78	217,734	98.93	486,547	54.51	407,367	26.14	238,904	21.38
p	-0.06		0.2		0.66		0.71		0.06	
	CANNED TOMATOES		FROZEN FISH		FRUIT JUICE		ADULT DIAPERS		SANITARY PADS	
	Volume	sp	Volume	sp	Volume	sp	Volume	sp	Volume	sp
Jan	881,744	23.57	7,462,343	206.25	142,001	140.36	103,002	207.42	23,903	36.45
Feb	1,184,770	23.54	11,526,547	213.00	95,272	138.61	58,345	207.42	39,431	36.33
Mar	1,087,401	24.83	5,156,836	206.25	77,847	142.18	17,104	207.42	38,263	36.43
Apr	1,603,619	25.83	1,052,380	213.00	92,111	146.74	39,931	223.24	33,050	38.88
May	1,142,726	27.31	2,339,447	213.00	112,824	144.49	55,604	223.24	45,958	38.15
Jun	975,798	27.56	3,962,994	213.00	49,340	175.66	25,783	223.24	66,076	32.94
Jul	868,984	28.01	3,639,406	213.00	90,720	181.31	39,711	223.24	54,711	33.01
Aug	250,167	27.50	4,164,326	213.00	47,552	183.16	82,857	224.08	22,988	33.01
p	-0.33		-0.26		-0.68		-0.18		-0.35	

Volume: Volume imported, Sp: Selling Price, P: Correlation Coefficient

8.3 From the table above, for products such as Cheese, Macaroni, Spaghetts and Black lentils, it is observed that there is a positive linear relationship whereby an increase in the volume imported led to an increased in selling price.

8.4 On the other hand, other product such as Margarine, Powdered Milk, Canned Tomatoes, Frozen Fish, Fruit Juice, Adult Diapers and Sanitary pads are affected by the quantity imported for the local market. The correlation value shows the linear relationship between the volume imported and the selling price and it can be observed that for the mentioned products, as the volume imported reduced, the selling price increased. In other words, as the product is in short supply on the market, the selling prices tend to increase. However, the average correlation of the basket of goods is 0.001 indicating that there is no linear relationship between the quantity imported and selling prices.

Section 9: Abusive Pricing, Unfair Practices and Abnormal Market Behaviours

9.1 According to OECD (2020), during a period of crisis, exploitative pricing practices may be challenging than in normal period. Companies may be faced with disrupted inventories or disruptions in the raw materials which can increase the companies' costs and lead to increase in prices. Disturbances in prices may be due to increase demand and supply shortages.

9.2 Several cases of exploitative pricing or unfair treatment of prices 'has no reasonable relation to the economic value of the product' and this has been the case when (i) the price cost margin is excessive and (ii) the price imposed 'is either unfair in itself or when compared to competing products', OECD (2020). Situation of crisis not only creates openings for opportunistic behaviour on the part of companies that already possess market power, but can also lead to the creation of short term, windfall market power. Such market power tends to be abused.

9.3 The hypothetical basket of goods and the data provided by the retail outlets companies¹³ enabled the identification of demand shocks such as "Panic Buying" across the retail outlets and the period in which the phenomenon was observed. Subsequently, whether demand shocks across retail outlets, i.e. "Panic Buying", led to price fluctuations was also assessed and analysed. Table 6 below shows the selected products and period whereby signs of panic buying may be identified.

Table 6: Signs of "Panic Buying" among selected products for the period January to August 2020

	BASMATI RICE		EDIBLE OIL		MARGARINE		CHEESE		POWDERED MILK		CEREAL		MACAONI	
	Stk	Sales	Stk	Sales	Stk	Sales	Stk	Sales	Stk	Sales	Stk	Sales	Stk	Sales
Jan	244	141	2746	2297	886	763	3169	4600	3140	1950	1101	915	997	511
Feb	103	100	2851	2640	1165	821	5510	4702	2145	2577	471	826	279	658
Mar	247	327	2190	3419	986	806	6256	5331	3791	4054	1147	1260	1002	785
Apr	532	137	1487	1298	2004	945	7232	5169	4507	3491	801	815	1046	494
May	146	45	2495	1355	1351	767	6496	3732	2656	2462	1233	755	796	551
Jun	110	81	2138	1472	1586	1051	2453	3815	1902	2098	805	340	383	605
Jul	81	76	3260	2367	1641	535	4358	3780	3158	2529	953	402	695	527
Aug	151	73	3616	2755	1468	606	8075	3695	2447	2314	1006	624	472	401

¹³ Out of the 4 retail chain companies, only 2 have submitted the data related to stock and sales. Thus, it is assumed the data is representative of other retail chain outlets.

	BLACK LENTILS		CANNED TOMATOES		FRUIT JUICE		WASHING LIQUID DETERGENT		TOOTHPASTE		ADULT DIAPERS		SANITARY PADS	
	Stk	Sales	Stk	Sales	Stk	Sales	Stk	Sales	Stk	Sales	Stk	Sales	Stk	Sales
Jan	431	874	12228	9459	211	256	415	397	288	140	48	30	182	96
Feb	1353	1102	9562	8108	330	239	737	728	56	132	0	21	94	105
Mar	2079	2501	8189	10887	106	235	860	700	232	150	24	26	145	159
Apr	3383	1452	7340	5216	119	163	122	393	166	145	81	35	149	60
May	443	598	6682	5737	247	135	796	394	164	89	0	20	157	93
Jun	477	840	1854	2931	119	119	378	462	82	104	24	23	168	162
Jul	995	938	2270	2827	92	103	361	354	275	124	60	13	148	102
Aug	1163	858	1854	2793	88	79	410	465	164	89	0	12	88	101

STK: Stock

9.4 From the table 6 above, it can be observed that the phenomenon¹⁴ of “Panic Buying” started to grow from the month of February and March. During the start of the phenomenon, products that have been affected by the phenomenon includes Basmati Rice, Edible Oil, Powdered Milk, Cereals, Black lentils, Canned Tomatoes, Fruit Juices and Sanitary Pads. However, it is also observed the demand shocks persisted over some period for products such as Black lentils, Canned Tomatoes and washing liquid detergents.

9.5 Subsequently, it is also important to analyse whether the prices fluctuated concurrently with the demand shock (Panic Buying). The correlation coefficient is used to identify whether there is a linear relationship between the demand shocks and the price movements of the selected products. Table 7 below shows the selling prices and the sales level of the selected products from period January to August 2020.

Table 7: Retail Prices and Sales of Selected Products from January to August 2020

	BASMATI RICE		EDIBLE OIL		MARGARINE		CHEESE		POWDERED MILK		CEREAL		MACAONI	
	SP	Sales	SP	Sales	SP	Sales	SP	Sales	SP	Sales	SP	Sales	SP	Sales
Jan	319.99	141	43.15	2297	81.87	763	71.63	4600	189.45	1950	93.55	915	41.26	511
Feb	319.73	100	43.93	2640	78.78	821	71.80	4702	190.56	2577	95.74	826	39.06	658
Mar	325.58	327	44.30	3419	79.73	806	71.96	5331	193.74	4054	97.60	1260	41.28	785
Apr	340.13	137	46.84	1298	86.08	945	73.06	5169	212.69	3491	98.72	815	43.38	494
May	319.63	45	45.77	1355	82.91	767	71.89	3732	214.50	2462	98.72	755	35.12	551
Jun	269.23	81	46.04	1472	57.00	1051	69.50	3815	215.88	2098	83.09	340	32.43	605
Jul	273.73	76	45.39	2367	76.47	535	71.11	3780	215.25	2529	93.97	402	36.40	527
Aug	271.92	73	45.39	2755	74.78	606	76.04	3695	212.78	2314	98.93	624	38.94	401
ρ	0.46		-0.66		-0.33		-0.01		-0.15		0.57		-0.01	

¹⁴ Panic buying is a socially undesirable, herd behaviour where large quantities of daily necessities and medical supplies are purchased from markets, which often results in stock out situation (K.F.Yuan et al, 2020).

	BLACK LENTILS		CANNED TOMATOES		FRUIT JUICE		WASHING LIQUID DETERGENT		TOOTHPASTE		ADULT DIAPERS		SANITARY PADS	
	SP	Sales	SP	Sales	SP	Sales	SP	Sales	SP	Sales	SP	Sales	SP	Sales
Jan	19.59	874	23.57	9459	140.36	256	289.43	397	58.56	140	207.42	30	36.45	96
Feb	20.86	1102	23.54	8108	138.61	239	286.28	728	59.56	132	207.42	21	36.33	105
Mar	22.61	2501	24.83	10887	142.18	235	297.18	700	57.47	150	207.42	26	36.43	159
Apr	25.34	1452	25.83	5216	146.74	163	325.00	393	59.68	145	223.24	35	38.88	60
May	26.21	598	27.31	5737	144.49	135	293.28	394	58.08	89	223.24	20	38.15	93
Jun	26.42	840	27.56	2931	175.66	119	307.32	462	57.24	104	223.24	23	32.94	162
Jul	26.58	938	28.01	2827	181.31	103	290.64	354	58.33	124	223.24	13	33.01	102
Aug	26.14	858	27.50	2793	183.16	79	308.33	465	60.38	89	224.08	12	33.01	101
p	-0.28		-0.86		-0.86		-0.29		-0.09		-0.34		-0.48	

Sp: Selling Price and P: Correlation Coefficient

9.6 From the table above, it can be observed that as a whole, the relationship between the sales and the selling prices are fairly negative (-0.24), i.e. as demand for the products, some product retail prices tend to fall. Concurrently increase in prices are observed in products such as Basmati rice and Cereals. Thus, the presence of abusive pricing based on demand shocks is not observed across the overall selected goods.

9.7 Abusive practices can also be in the form of hoarding. Hoarding is the process of acquiring good in excess of immediate needs, M.Baddeley (2020). It is intuitive to analyse whether the retail outlets companies have been indulged in hoarding and whether the selling prices of the products were affected. It is assumed that retail outlets will hoard goods (increase in inventory) and then charge higher retail prices, ceteris paribus. Table 8 gives an overview of the selling prices and the stock level¹⁵ of the selected products.

Table 8: Retail prices and stock level for selected imported goods from January to August 2020

	BASMATI RICE		EDIBLE OIL		MARGARINE		CHEESE		POWDERED MILK		CEREAL		MACAONI	
	SP	STK	SP	STK	SP	STK	SP	STK	SP	STK	SP	STK	SP	STK
Jan	319.99	244	43.15	2746	81.87	886	71.63	3169	189.45	3140	93.55	1101	41.26	997
Feb	319.73	103	43.93	2851	78.78	1165	71.80	5510	190.56	2145	95.74	471	39.06	279
Mar	325.58	247	44.30	2190	79.73	986	71.96	6256	193.74	3791	97.60	1147	41.28	1002
Apr	340.13	532	46.84	1487	86.08	2004	73.06	7232	212.69	4507	98.72	801	43.38	1046
May	319.63	146	45.77	2495	82.91	1351	71.89	6496	214.50	2656	98.72	1233	35.12	796
Jun	269.23	110	46.04	2138	57.00	1586	69.50	2453	215.88	1902	83.09	805	32.43	383
Jul	273.73	81	45.39	3260	76.47	1641	71.11	4358	215.25	3158	93.97	953	36.40	695
Aug	271.92	151	45.39	3616	74.78	1468	76.04	8075	212.78	2447	98.93	1006	38.94	472
p	0.67		-0.38		-0.12		0.84		-0.07		0.26		0.60	

¹⁵ Assuming that no other factors are affecting retail prices

	BLACK LENTILS		CANNED TOMATOES		FRUIT JUICE		WASHING LIQUID DETERGENT		TOOTHPASTE		ADULT DIAPERS		SANITARY PADS	
	SP	STK	SP	STK	SP	STK	SP	STK	SP	STK	SP	STK	SP	STK
Jan	19.59	431	23.57	12228	140.36	211	289.43	415	58.56	288	207.42	48	36.45	182
Feb	20.86	1353	23.54	9562	138.61	330	286.28	737	59.56	56	207.42	0	36.33	94
Mar	22.61	2079	24.83	8189	142.18	106	297.18	860	57.47	232	207.42	24	36.43	145
Apr	25.34	3383	25.83	7340	146.74	119	325.00	122	59.68	166	223.24	81	38.88	149
May	26.21	443	27.31	6682	144.49	247	293.28	796	58.08	164	223.24	0	38.15	157
Jun	26.42	477	27.56	1854	175.66	119	307.32	378	57.24	82	223.24	24	32.94	168
Jul	26.58	995	28.01	2270	181.31	92	290.64	361	58.33	275	223.24	60	33.01	148
Aug	26.14	1163	27.50	1854	183.16	88	308.33	410	60.38	164	224.08	0	33.01	88
ρ	0.02		-0.91		-0.66		-0.64		-0.17		0.14		0.21	

Sp: Selling Price, STK: Stock and P: Correlation Coefficient

9.10 From table above, it can be observed that for some products as stock increased, retail prices also increased such as for Basmati rice, Cheese, Cereal, Macaroni and Adult Diapers, other things remaining constant. However, on average, it is viewed that there is no abusive pricing due to hoarding as no relationship is found between the increase in stock and the movements in the retail prices (correlation of 0.001), ceteris paribus.

9.11 It is also intuitive to analyse the price movements of locally produce substitutes in order to observe whether there has been an exploitative pricing and abnormal market behaviour in the pricing strategy (profiteering) of the locally manufactured products. Table 9 below shows the percentage change in prices of imported goods and their locally produced substitutes.

Table 9: Retail prices for selected imported products and their locally manufactured substitutes from January to August 2020

			Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20
Items	Brand	Origin	%change	%change	%change	%change	%change	%change	%change
Edible oil	Rani bottle	Local	3.75	-3.64	4.93	-2.50	-0.56	0.00	0.00
	Leader bottle	Imported	-0.15	5.54	6.49	-2.08	1.70	-2.71	0.00
Macaroni	Faucon	Local	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Barilla	Imported	-6.86	7.41	6.54	-24.14	-10.38	17.08	9.32
Laundry powder	Fairy	local	0.00	0.00	4.20	-1.44	1.47	-2.37	0.67
	Ariel	Imported	-3.77	-4.77	5.01	0.00	-4.77	0.00	3.56
Toothpaste	Colgate total	Imported	-1.76	-7.50	4.26	0.65	-1.62	-0.94	6.50
	Dentamax	local	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Aquafresh	Imported	10.31	0.00	6.92	-10.29	-2.63	8.93	2.04
Sanitary pads	Talia thin regular	Local	0.00	0.58	5.46	-4.00	-15.70	0.30	0.00
	Always thin normal	Imported	-0.63	0.00	7.83	0.00	-11.93	0.14	0.00

9.12 From table above, on average, the locally produced substitutes¹⁶ did not follow the same trend like the imported products. In the month of April, locally manufactured products such as Edible oil, Laundry powder and sanitary pads had an increased in their prices which may be attributed to the rise in the cost of distribution and production due to the local confinement obligations (e.g. rise in cost of labour and increase in lead time along the supply chain). Subsequently, the prices of the locally manufactured products did not increase.

9.13 The consumer behaviour is an important aspect in analysing the movement of prices. The study of the consumer behaviour deepens the analysis by assessing the substitution switching effects, the Veblen effects¹⁷, tastes and preferences of the consumers in their buying pattern and behaviour during the period of study. For instance, it would be worth studying whether the increase in retail prices of a product did not affect the consumer buying patterns or simply, whether the consumer preferred to buy the products that was relatively expensive despite the availability of substitutes at a lower price.

9.14 For certain products and brands, COVID-19 has caused supply-chain disruptions and when rational consumers could not find their preferred product on their preferred retailers' shelves or when consumer is faced with a rise in prices of their preferred products or brands, they would rationally change their shopping behaviour (Mckinsey and Co, 2020). Thus, during a period of crisis, the rational consumers will choose the cheapest product brand and there is an increased shift towards store brands and promotions offering lower prices on products (Gázquez-Abad, Martínez-López, and Esteban-Millat, 2017).

9.15 However, despite the fact that consumer behaviour is inherently rational, many consumers have preferences/habit toward a specific brand as value, availability, and quality are the main drivers for such choices over another particular brand, irrespective of the price value, Tauber (1972). Therefore, brand preference/habit and strong emotional feelings towards the brands allow for consumers to feel attached to such an extent where it creates preference in products, which they would not prefer over competitors' products, Kaswengi and Diallo (2015) and Mueller and Szolnoki, (2010).

9.16 In order to observe whether, during the COVID-19 period, consumers have adopted a rational behaviour and whether there was a substitution effect for basic commodities, the sales,

¹⁶ The details of the substitutes products were extracted from the hypothetical basket of goods and the prices of raw materials used in the production of the substitutes were assumed not to be affected by external factors.

¹⁷ Abnormal market behaviour where consumers purchase the higher-priced goods whereas similar low-priced (but not identical) substitutes are available

stock levels and selling prices of the basic staples from the hypothetical basket of goods are analysed. Table 10 below shows the selling prices, sales and stock level of each brand for their respective commodity.

Table 10: Selling prices, sales and stock level of basic commodities from January to August 2020.

	Cheese									Washing Liquid Detergent					
	Kraft			Bega			Melbourne			Le Chat			Xtra		
	SP	Sales	Stk	SP	Sales	Stk	SP	Sales	Stk	SP	Sales	Stk	SP	Sales	Stk
Jan	76.04	6927	2697	69.61	5538	5852	69.24	1336	960	320.53	469	580	258.32	324	250
Feb	76.04	5729	10775	70.61	7016	4256	68.74	1362	1500	322.57	1196	1095	249.98	260	380
Mar	76.04	9575	8347	71.11	4817	8508	68.74	1603	1915	327.23	1266	1576	267.13	135	144
Apr	77.05	6527	6755	71.65	7425	13079	70.48	1555	1861	360.00	526	68	290.00	261	176
May	77.23	5361	15956	67.98	4427	1899	70.48	1409	1632	329.90	492	1269	256.65	296	323
Jun	78.35	4304	2709	64.51	4854	2076	65.64	2287	2575	324.63	528	380	290.00	395	375
Jul	81.05	3503	1573	67.56	5104	7559	64.71	2732	3941	324.63	438	351	256.65	271	371
Aug	84.64	3436	2880	72.61	5759	18928	70.86	1892	2418	360.00	698	808	256.65	233	12

	Canned Tomatoes						Cereal								
	Belinda			Vaiva			Kellogs Original			Weetabix Original			Koko Krunch		
	SP	Sales	Stk	SP	Sales	Stk	SP	Sales	Stk	SP	Sales	Stk	SP	Sales	Stk
Jan	24.53	13964	15475	22.60	4954	8982	99.53	268	321	86.77	1731	1772	94.35	747	1212
Feb	23.98	11448	15524	23.09	4768	3600	99.53	357	264	89.08	1545	739	98.61	575	410
Mar	25.67	15738	13616	23.99	6036	2763	102.87	556	546	91.32	2659	2428	98.61	565	468
Apr	27.67	10046	7882	23.99	387	6799	102.87	435	588	94.68	854	473	98.61	1157	1341
May	27.67	5542	8265	26.96	5933	5099	102.87	437	364	94.68	1095	2416	98.61	733	920
Jun	27.67	3049	2735	27.46	2813	973	59.57	272	207	91.07	165	1528	98.61	583	679
Jul	27.32	4180	3008	28.71	1474	1532	88.39	207	265	98.16	349	1543	95.35	652	1051
Aug	27.32	4344	3468	27.68	1243	240	96.92	177	185	101.28	1081	2432	98.61	615	402

	POWDERED MILK									FRUIT JUICE					
	FARMLAND			TWIN COW			RED COW			SUN UP TROPICAL			SUNQUICK ORANGE		
	SP	Sales	Stk	SP	Sales	Stk	SP	Sales	Stk	SP	Sales	Stk	SP	Sales	Stk
Jan	194.99	3651	6166	168.36	1141	1793	205.00	1057	1462	110.99	25	22	169.73	487	399
Feb	195.88	4661	4086	170.07	1882	1061	205.73	1188	1290	110.99	13	18	166.24	465	642
Mar	199.74	8412	7743	175.16	1663	2097	206.33	2087	1532	110.99	21	24	173.36	450	187
Apr	212.30	7660	8337	202.04	2071	3536	223.73	743	1650	110.99	18	24	182.50	308	213
May	213.58	4884	4476	206.19	1287	1453	223.73	1216	2038	110.99	15	31	177.99	256	462
Jun	213.65	4171	3161	209.30	1045	1320	224.68	1079	1227	128.88	13	20	222.45	226	219
Jul	213.06	5303	6742	207.60	1066	1103	225.10	1220	1628	128.88	16	28	233.74	190	156
Aug	212.86	4523	5168	200.39	1392	1186	225.10	1026	988	128.88	16	32	237.45	142	144

9.17 In the table above, it has been observed that consumers behaved irrationally with respect to some specific products¹⁸. During the COVID-19 period, for the above products as shown by the highlighted cells, consumers' preferences/habit for a particular brand dominated the buying pattern vis-a-vis the increase in the retail prices of the brand. That is, given the availability of substitutes at lower prices, consumers preferred to buy the products' brand which was more expensive due to their irrational market behaviours/characteristics. For example, for cheese, despite Melbourne being the cheapest brand, consumers preferred to purchased Kraft. Likewise, for powdered milk, despite Twin Cow being the cheapest brand, consumers preferred to purchase Farmland despite being the expensive brand.

9.18 In sum, using the statistical technique (correlation coefficient), it is observed that no signs of abusive pricing have been detected with respect to demand shocks such as "Panic Buying" and to Hoarding. Signs of panic buying were noticed in the month of February and March but for some products, persisted increase in retail prices were observed for Basmati rice and Cereals. The locally produced substitutes were not subject to increase in their retail prices over the period of study, which showed that no exploitative pricing practices or profiteering has been observed from the retail chain companies. In addition, it has also been observed that consumers behaved irrationally with respect to certain basic commodities as the consumers' preferences/habit for a specific type of products outweighed the effect of the increased in prices in their consumption behaviours.

¹⁸ For the purpose of the analysis, it is assumed that the substitutes are limited to the products provided in the hypothetical basket of goods.

Section 10: Forecasting

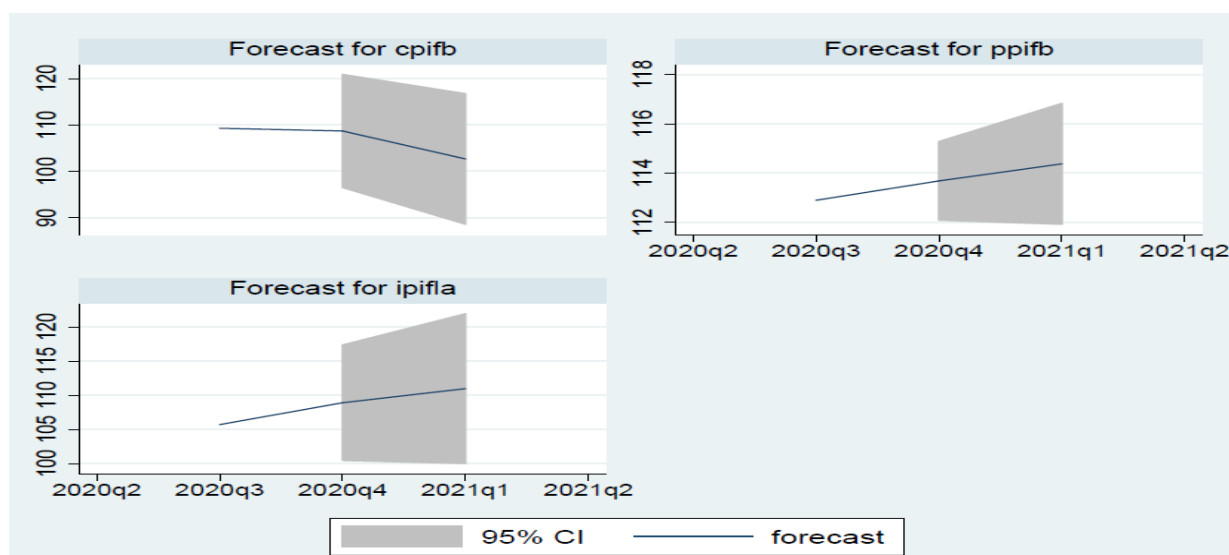
10.1 The report has provided a complete analysis of the evolution of prices, the causes and the degree to which the prices were affected during the COVID-19 period. However, there is also the need to speculate how retail prices will move in the near future in order to align policies and to pre-empt on any other external shocks.

10.2 The forecasting of the prices is performed under two different scenarios. The first scenario is when the government has intervened on the local markets through a combination of policies including, exchange rate policies, demand-side policies and supply-side policies. The objective is to curb the inflationary pressure on the local market and to cushion any shocks on the local markets. The second scenario is whereby the government has minimum intervention on the different markets and allows them to freely fluctuate and operate.

10.3 In order to forecast the different movement of related price indices, some basic models and statistical methodologies are applied. In the figure below, using the VAR model of the oil prices (freight costs) on the prices indices, the forecasted prices of the IPIfla, CPIfb and the PPIfb are shown below.

Scenario 1: Government Interventions on the different Markets.

Figure 13: Forecast of prices indices based on the movement of oil prices (freight cost)



10.4 As shown in figure 13, it is predicted that retail prices (CPIfb) will begin to fall as from the 4th Quarter of 2020 (December). The fall in the consumer prices is the result of the drastic decrease in international oil prices and on which the Government does not have any control as

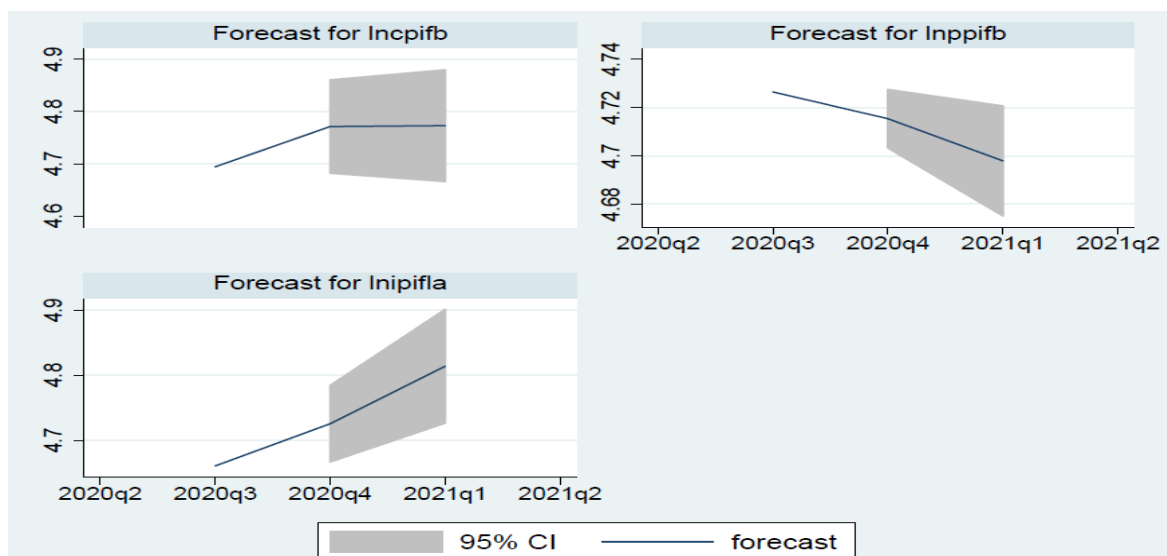
the price of oil is internationally determined by the aggregate demand and aggregate supply. In addition, as explained in section 7, the freight costs (changes in oil prices) are fully passed on to the consumers and given the drastic fall in world crude oil prices, the freight cost is expected to be reduced and the effect of the fall can be observed on the consumer prices. However, prices of imported foodstuff (IPIfla) is predicted to increase slightly which may be associated with the increase price of other transport cost such as insurance, operational cost, storage costs amongst others.

Scenario 2: Minimum Government Interventions on the different Markets.

10.5 In the second scenario, it is expected, as currently being the case, that Government will continue to allow all the markets to operate freely without any major interventions. That is, the Government will have minimum interventions on the exchange rate markets.

10.6 In figure 14 below, unlike the forecast in the above figure, the forecasting of the prices below incorporates the element of external shocks and the reaction of monetary policies including exchange rates, oil prices, money supply, short term interest rates amongst others. It is observed that the consumer prices of foodstuff and non-alcoholic beverages (CPIfb) will increase up to the 4th quarter 2020 and will stabilise at higher prices. This may be attributed to the effect of price bubbles whereby increase in prices may not be sustainable and will eventually stabilise or reduce to meet the expected demand and propensity to consume. On the other hand, the prices of the imported food stuffs are expected to have a steeper increase after the 4th quarter as the supply shocks on the foreign markets and exchange rates are likely to significantly impacted on import prices.

Figure 14: Forecast of prices indices based on the movement of exchange rates



Forecasting of the hypothetical basket of goods

10.7 The hypothetical basket of good was also forecasted based on the exponential smoothing techniques¹⁹. The table 10 below shows the expected movement of the value of the hypothetical basket of goods over the next three months.

10.8 The table below shows the estimated monthly value of the basket of goods from the period Jan 2020 till August 2020. For the month of March and April, the value of the basket of the hypothetical of goods amounted Rs3,330.44 and Rs 3,330.68 respectively. However, during that period the value of the basket of goods had an increase which is the consequences of rise in prices in that period which may be attributed to the external and markets shocks. In the second row, the values of the basket of goods were smoothed (stabilised) in order to adjust for unusual events.

10.9 Using the smooth values, the value of the basket of goods for the next three months were predicted and based in the mentioned forecasting technique, the values of the basket of goods is expected to stabilise and to lower values over the next three months (from September 2020 to November 2020).

Table 11: Forecast of the values of the basket of goods

Months	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20
Basket of Goods (Rs)	3,330.59	3,323.16	3,342.26	3,500.45	3,427.73	3,349.16
Smoothed values of goods and predicted values (Rs)	#N/A	3,330.59	3,330.44	3,330.68	3,334.07	3,335.95

Months	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20
Basket of Goods (Rs)	3,398.96	3,469.67			
Smoothed values of goods and predicted values (Rs)	3,336.21	3,337.47	3,340.11	3,273.31	3,207.84

19 Exponential smoothing is a time series forecasting technique that is used for predicting values for short term period that attempts to capture important patterns in the data. The technique is used especially when data have uneven phenomenon.

Figure 15: Forecast of values of the basket of goods



10.10 As shown in table 1 above, the predicted prices are expected to slightly increase in the month of September 2020 and subsequently, fall as from October 2020 to November 2020. The fall in the prices as shown in figure 11 above, is expected to be steep which may be foreseen to be caused by promotional campaigns of various retailers during these end of year periods.

10.11 In sum, based on forecasting model and techniques²⁰, it can be observed that prices will increase till December 2020 and will stabilise thereafter. This may be attributed to the effect of price bubbles whereby increase in prices may not be sustainable and will eventually stabilise or reduce to meet the expected demand and propensity to consume. For the hypothetical basket of goods, as from October 2020, the prices of the selected items in the basket of goods are expected to fall which will result into a fall in the value of the basket of goods. However, the analysis of the process should be cautiously interpreted as the basket of goods needs to be redesigned in order hinder any statistical biases and to be more representative of the consumption pattern.

²⁰ Disclaimer: The above scenarios are only indicative, based on historical data gathered from Bank of Mauritius, Statistic Mauritius, Consumer Affairs Unit accompanied by a number of assumptions. Assumptions by nature are uncertain and depend on a series of unknowns at this stage. The situation surrounding the COVID-19 shock is dynamic and changing rapidly on a daily basis. As such, the scenarios and models presented should by no means be considered as certain or accurate predictions for the future. They are only provided for discussion purposes.

Section 11: Conclusion and Future Directions

11.1 The study aimed at analysing the movement of retail prices from the period January to August 2020 with the objective to observe the price fluctuations during the Covid-19 period. In addition, the study assessed and analysed the possible causes of the movement in prices by taking into consideration the impact of exchange rates and freight cost, short supply of basic commodities on the market, abusive pricing, unfair practices and abnormal market behaviour.

11.2 Retail prices for some imported products in retail chain companies have increased, especially during the covid-19 period. The products showing increase in prices include milk, imported edible oil, cereals, black lentils, corn mutton, sardines, canned tomatoes, fruit juice and home cleaning products.

11.3 It was observed that exchange rates had an impact on the import prices and the consumer prices of foodstuffs. With an appreciation of foreign currencies, it is noted that the exchange rate pass through to the consumer prices of foodstuff is lower (2.17%) than the pass through of the import prices (10.38%). From the period January to August 2020, a 1 percent change in the foreign exchange rates led to an increase of 0.20% and 1.76% in value of the hypothetical basket of goods for the months of March and April, respectively. However, for the months of July and August, the value of the basket of goods increased and in August 2020, the abrupt increase in the value of the basket of goods was by 3.65%.

11.4 Freight cost affects the value of imports, i.e. a decrease in crude oil prices tends to decrease the value of imports and vice-versa. However, at the end of quarter 1 and 2 of year 2020, it is observed that despite the fall in the price of oil, the value of imports increased. The pass through of any rise in freight cost for foodstuffs are fully transferred to the consumer prices whereby a 1% increase in freight cost will lead to a 1% increase in the selling prices of foodstuffs.

11.5 The effect of freight and insurance cost on the hypothetical basket of goods do not have necessarily impacted on the selling prices of the selected items as the selling prices did not fluctuate in response to the changes in the freight and insurance cost during the period January to August 2020.

11.6 Using the import volume figures, no significant shortages were observed that led to increase in retail prices during the Covid-19 period and there is no linear relationship between the quantity imported and selling prices.

11.7 In relation to abusive pricing strategies, no signs of such price malpractices by the retail chain companies, were observed with respect to demand shocks such as “Panic Buying” and Hoarding. Signs of panic buying were noticed in the month of February and March but for some products, persisted increase in retail prices were observed for Basmati rice and Cereals. In addition, it has been observed that consumers behaved irrationally with respect to certain basic commodities as the consumers’ preferences/habit for a specific type of products outweighed the effect of the increased in the prices.

11.8 Using the information available and forecasting techniques, it is observed that when government has fully intervened on the different markets in order to curb inflationary pressure, retail prices are likely to fall as from the 4th Quarter 2020 (December) and which can be attributed to the drastic fall in crude oil prices. However, when the government has minimum interventions on the markets, retail prices are expected to increase till December 2020 and will stabilise thereafter. This may be attributed to the effect of price bubbles whereby increase in prices may not be sustainable and will eventually stabilise or reduce to meet the expected demand and propensity to consume. For the hypothetical basket of goods, as from October 2020, the prices of the selected items and the value of the hypothetical basket of goods are expected to fall.

Future Directions

11.9 The hypothetical basket of goods used in the study could be extended to represent other commodities such as agricultural products, utilities and basic expenses e.g. transport. Subsequently, a monitoring mechanism is to be implemented to gather information on prices and consumption patterns at regular interval for deeper analysis.

11.10 Given that small shops are closest to the consumers and more flexible than retail chain outlets companies, the study can be extended to assess and analyse the retail price movements for basic commodities in small shops in different areas across the island.

11.11 In order to have a constant monitoring on the retail prices of basic commodities, there is a need to revamp the “observatoire des prix” to assess the evolution of retail prices of basic commodities and to ensure transparency of the prices to the general public. Interval price movement reports can be produced accordingly.

11.12 It is suggested that educational and sensitisation campaigns be carried out with an objective to limit irrational consumers' behaviours during peak periods, festive periods and during period of crisis.

11.13 On 14th September 2020, the Association Professionnelle des Transitaires and the Association des Courtiers Agrees en Douane issued a communique mentioning that shipping lines have stopped providing direct services to Mauritius, and would cause delays, which is expected to be between 54 and 60 days. In that context, a work plan/dedicated study should be established to ensure the supply of basic commodities and find alternative strategies to ensure the continuous the supply chain of the basic staples.

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Appendix

A. The Hypothetical Basket of Goods

Composition of the Consumption Basket:

SN	ITEMS
1	BASMATI RICE
2	SUGAR
3	FLOUR
4	EDIBLE OIL
5	MARGARINE
6	BUTTER
7	CHEESE
8	POWDERED MILK
9	CEREAL
10	TEA
11	MACARONI
12	NOODLES
13	SPAGHETTI
14	BLACK LENTILS
15	CORNED BEEF
16	CORNED MUTTON
17	SARDINES
18	CANNED TOMATOES(WHOLE PEELED
19	CANNED PEAS
20	FROZEN CHICKEN
21	FROZEN FISH
22	FROZEN SAUSAGES
23	EGGS
24	FRUIT JUICE
25	LAUNDRY POWDER
26	WASHING LIQUID DETERGENT
27	TOOTHPASTE
28	TOILET SOAP
29	HOME CLEANING
30	TISSUE PAPER
31	ADULT DIAPERS
32	SANITARY PADS

B. The Methodological Approach to Measure the Exchange Rate Pass-Through On Prices

The Model Specification:

In order to study of the degree and extent of the exchange rate effects through prices across the stages of the distribution channel i.e. the effect of a change in exchange rate and the impact prices from import to consumers, a Vector Autoregressive (VAR) model based on the Cholesky decomposition of the variance-covariance matrix and the impulse response functions are used to compute the elasticity of the exchange rate pass-through, Mirdala, (2014).

The VAR model below is derived from the model used in a study carried out by Mc Carthy (2006) to analyse the price effect along the distribution chain (from import to production and from production to retail). The model below caters for the internal and external shocks such as supply shocks, demand shocks, exchange rate shocks and account for the intervention of the Bank of Mauritius with respect to the monetary policy.

$$\pi_t^{oil} = E_{t-1} (\pi_t^{oil}) + \varepsilon_t^s \dots\dots\dots (1)$$

$$\tilde{y}_t = E_{t-1} (\tilde{y}_t) + \alpha_1 \varepsilon_t^s + \varepsilon_t^d \dots\dots\dots (2)$$

$$\Delta e_t = E_{t-1} (\Delta e_t) + \beta_1 \varepsilon_t^s + \beta_2 \varepsilon_t^d + \varepsilon_t^e \dots\dots\dots (3)$$

$$\pi_t^m = E_{t-1} (\pi_t^m) + \alpha_1 \varepsilon_t^s + \alpha_2 \varepsilon_t^d + \alpha_3 \varepsilon_t^e + \varepsilon_t^m \dots\dots\dots (4)$$

$$\pi_t^p = E_{t-1} (\pi_t^p) + \beta_1 \varepsilon_t^s + \beta_2 \varepsilon_t^d + \beta_3 \varepsilon_t^e + \beta_4 \varepsilon_t^m + \varepsilon_t^p \dots\dots\dots (5)$$

$$\pi_t^c = E_{t-1} (\pi_t^c) + \gamma_1 \varepsilon_t^s + \gamma_2 \varepsilon_t^d + \gamma_3 \varepsilon_t^e + \gamma_4 \varepsilon_t^m + \gamma_5 \varepsilon_t^p + \varepsilon_t^c \dots\dots\dots (6)$$

$$r_t = E_{t-1} (r_t) + \theta_1 \varepsilon_t^s + \theta_2 \varepsilon_t^d + \theta_3 \varepsilon_t^e + \theta_4 \varepsilon_t^m + \theta_5 \varepsilon_t^p + \theta_6 \varepsilon_t^c + \varepsilon_t^{MP} \dots\dots\dots (7)$$

$$\Delta M_t = E_{t-1} (\Delta M_t) + \rho_1 \varepsilon_t^s + \rho_2 \varepsilon_t^d + \rho_3 \varepsilon_t^e + \rho_4 \varepsilon_t^m + \rho_5 \varepsilon_t^p + \rho_6 \varepsilon_t^c + \rho_7 \varepsilon_t^{MP} + \varepsilon_t^{MP} (8)$$

Supply shocks (ε_t^s) –oil prices fluctuations which is the crude oil price (US \$ per barrel) (π_t^{oil})

Demand shocks (ε_t^d) - is the measured by the real GDP growth rate (\tilde{y}_t) in the country after accounting for the contemporaneous effect of the supply shock.

Exchange rate shocks (ε_t^e) are identified from the dynamics of exchange rate changes (Δe_t) after taking into account the contemporaneous effect of demand and supply shocks.

Changes in price level at each stage of the distribution chain – import (π_t^m), producer (π_t^p), and consumer (π_t^c) – at time period t , is assumed to contain several contemporaneous components such as inflation expectation such as the first component at the end of the time period $t-1$. ε_t^m , ε_t^p and ε_t^c are import price, producer price and consumer price shock respectively. The shocks at each stage are assumed to be the volatility in pricing and mark ups of the firms.

In addition, the Central Bank's behaviours and responses to the economic volatility of the exchange rates is estimated where the short term interest rates (r_t) are related to the above mentioned variables and the money demand equation relates the money growth (ΔM_t) to the other variables in the model. The shocks in the monetary policy adopted by the central bank are denoted as ε_t^{mp} and ε_t^{md} is the money demand shock and E_{t-1} represents the expectation of the variable based on the information set available at end of period $t-1$.

The variables and Data:

The estimation of the above mentioned model made use of 30 quarters' data starting from the year first quarter 2013 till the third quarter of 2020. The data was compiled from different official sources, namely, the Statistics Mauritius and Bank of Mauritius.

Shocks	Variables	Description	Source
Supply	crude oil price (US \$ per barrel) (π_t^{oil})	Quarterly average of the Brent oil compiled from the International Exchange of London (ICE)	Bank of Mauritius
Demand	real GDP growth rate (\tilde{y}_t)	The Quarterly real growth rates which is a measure of changes in aggregate demand	Statistics Mauritius
Exchange Rate	exchange rate changes (Δe_t)	The Mauritius Exchange Rate index (MERI) - The weighted average of bilateral exchange rates for the Mauritian rupee against the currencies of its important trading partners.	Bank of Mauritius
Import prices	Import prices	The Import Price Index (IPI) provides an	Statistics

	(π_t^m) ,	overall measure of pure price changes in Mauritian Rupees of goods imported into the country. This index is constructed from import prices of a "constant" well-defined representative basket of commodities selected from imports data in the base year and the methodologies is based on the guidelines of the “IMF Export and Import Price Index Manual, Theory and Practice, 2009”.	Mauritius
Producer Prices	Producer Prices (π_t^p) ,	Producer Prices Index (PPI) - for the Manufacturing of Food Products and Beverages. The PPI measures pure price changes in the effective prices received by producers for the part of their products which is sold on the domestic markets and exclude Export oriented Enterprises.	Statistics Mauritius
Retail Prices	Consumer Prices (π_t^c)	Consumer Price Index (CPI) of food stuff and Non-alcoholic beverages measures the change in the level of prices of a fixed basket of goods and services that the private consumer buys. The CPI excludes Goods produced by households and utilised for their own consumption as well as those received free.	Statistics Mauritius
Monetary	short term interest rates (r_t)	A 91-day T-bills rates	Bank of Mauritius
	money growth (ΔM_t)	Broad Money Growth is an instrument used by the Bank of Mauritius to track the growth of “broad money” to help forecast inflation and includes short-duration deposits and short-term securities other than shares.	Bank of Mauritius

The Estimation Strategy:

The order of the variables is important as it enable the identification of the structural shocks in the mode. As shown in equation (1) in the model above, the oil prices are the first to be ordered because the residual of oil prices are assumed to be unlikely affected by other shocks except the oil shock itself and the oil prices shocks affect other variables contemporaneously in the model.

Subsequently, the real output (GDP) is then ordered as the oil shocks will influence the output of the economy which will then be transmitted to the exchange rates volatility. Following the movement in the exchange rate, the import prices are ordered as it is the first price factor to be affected first followed by the producer price index as main inputs are imported and are subject to volatility of the exchange rates) and the retail price index as the price index is directly impacted by the import prices and indirectly affected by the producer price index. The short term interest rates and the money supply growth are subsequently ordered.

The Impulse Response Functions (IRFs) were subsequently estimated in order to assess the pattern of the exchange rate pass-through such as the pricing behaviour of the firms and the degree of pries rigidity across the distribution chain. The exchange rate pass through to domestic prices is calculated from the impulse response function results and the pass through elasticity at t is given by:

Pass through elasticity at time t:

$$\frac{[\text{Percentage change in the price level } t \text{ quarters after the shock}]}{[\text{Initial per cent change in the exchange rate at time } t=0]}$$

The numerator is the percentage change in the level of the respective price indices between the period zero, when the initial exchange rate shock hits, at time t. The denominator is the percentage change in the nominal effective exchange rate at time 0.

Validity of the model:

The diagnosis tests were performed on the model and the following has been noted:

- ✓ The variables are not serially correlated at the optimal lags
- ✓ Using the Jarque-Bera test, the residuals are normally distributed (Ho: residuals are normally distributed is not rejected)

C. The Methodological Approach To Measure Shipping Cost Pass-Through On Prices

In order to analyse the impact and the sensitivity of the changes in the prices of oil as a measure of shipping cost, a VAR model based on the Cholesky decomposition was developed and estimated. The VAR model uses quarterly data from first quarter 2013 to third quarter 2020. The model developed is as follows:

$$\pi_t^{\text{oil}} = E_{t-1} (\pi_t^{\text{oil}}) + \varepsilon_t^s \dots\dots\dots (1)$$

$$I_t = E_{t-1} (I_t) + \alpha_1 \varepsilon_t^s + \varepsilon_t^d \dots\dots\dots (2)$$

$$\pi_t^m = E_{t-1} (\pi_t^m) + \alpha_1 \varepsilon_t^s + \alpha_2 \varepsilon_t^d + \alpha_3 \varepsilon_t^e + \varepsilon_t^m \dots\dots\dots (3)$$

$$\pi_t^p = E_{t-1} (\pi_t^p) + \beta_1 \varepsilon_t^s + \beta_2 \varepsilon_t^d + \beta_3 \varepsilon_t^e + \beta_4 \varepsilon_t^m + \varepsilon_t^p \dots\dots\dots (4)$$

$$\pi_t^c = E_{t-1} (\pi_t^c) + \gamma_1 \varepsilon_t^s + \gamma_2 \varepsilon_t^d + \gamma_3 \varepsilon_t^e + \gamma_4 \varepsilon_t^m + \gamma_5 \varepsilon_t^p + \varepsilon_t^c \dots\dots\dots (5)$$

The impulse response functions were constructed from the VAR using the following variables in the order listed: Crude oil price, the Import trade volumes (I_t), which is used as a proxy for the demand of cargo transport services (UNCTAD, 2010), followed by import price index, producer price index for the Manufacturing of Food Products and Beverages, the Consumer Price Index (CPI) of food stuff and Non alcoholic beverages (Details on the variables has already been described in part A). Import volumes were obtained from Statistics Mauritius.

Validity of the model:

The diagnosis tests were performed on the model and the following has been noted:

- ✓ The variables are not serially correlated at the optimal lags
- ✓ Using the Jarque-Bera test, the residuals are normally distributed (Ho: residuals are normally distributed is not rejected)

D. Average Retail Prices of the Hypothetical Basket of Goods

	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20
Basmati Rice	319.99	319.73	325.58	340.13	319.63	269.23	273.73	271.92
Sugar	35.11	35.11	35.11	35.58	35.58	35.40	35.40	35.40
Flour 2 Kg	50.74	50.99	52.50	52.50	52.75	52.75	50.99	50.99
Edible Oil	43.15	43.93	44.30	46.84	45.77	46.04	45.39	45.39
Margarine	81.87	78.78	79.73	86.08	82.91	57.00	76.47	74.78
Butter	82.14	81.33	81.71	83.28	81.16	75.79	79.81	82.93
Cheese	71.63	71.80	71.96	73.06	71.89	69.50	71.11	76.04
Powdered Milk	189.45	190.56	193.74	212.69	214.50	215.88	215.25	212.78
Cereal	93.55	95.74	97.60	98.72	98.72	83.09	93.97	98.93
Tea 500gm	170.81	171.95	172.89	176.79	175.70	174.62	174.28	174.08
Macaroni	41.26	39.06	41.28	43.38	35.12	32.43	36.40	38.94
Noddles	8.13	8.28	8.50	8.50	8.25	8.50	8.43	8.43
Spaghetti	50.23	52.81	48.67	55.34	54.21	54.51	55.01	54.51
Black Lentils	19.59	20.86	22.61	25.34	26.21	26.42	26.58	26.14
Corn beef	95.45	94.95	96.17	97.32	96.13	94.82	95.72	111.83
Corn Mutton	101.50	101.56	106.93	110.30	111.08	118.05	123.82	127.30
Sardines	19.63	19.63	19.66	20.88	21.38	21.38	21.38	21.38
Tomatoes whole	23.57	23.54	24.83	25.83	27.31	27.56	28.01	27.50
Canned Peas	24.91	24.66	24.91	24.87	25.25	25.25	25.25	25.83
Frozen Chicken 1 kg	191.88	191.88	191.88	191.88	192.25	184.50	192.25	197.63
Frozen Fish 1 Kg	206.25	213.00	206.25	213.00	213.00	213.00	213.00	213.00
Frozen Sausages	53.00	52.75	52.75	56.75	56.75	53.86	55.99	55.62
Eggs Pack of 6	41.38	41.38	41.38	41.38	40.87	40.54	41.38	40.55
Fruit Juice(Sun quick, Sunup)	140.36	138.61	142.18	146.74	144.49	175.66	181.31	183.16
Laundry Powder 3kg	345.10	336.60	326.25	341.63	339.83	331.28	328.33	336.49
Washing liquid detergent 3 L	289.43	286.28	297.18	325.00	293.28	307.32	290.64	308.33
Toothpaste	58.56	59.56	57.47	59.68	58.08	57.24	58.33	60.38
Toilet soap	24.10	23.26	24.28	24.66	23.73	24.81	24.46	24.44
Home cleaning 1.3 Litre	139.56	134.59	136.88	143.95	144.26	140.63	144.26	149.21
Tissue Paper 6 rolls	74.42	76.27	73.25	76.27	76.27	75.93	75.76	78.70
Adult Diapers	207.42	207.42	207.42	223.24	223.24	223.24	223.24	224.08
Sanitary Pads	36.45	36.33	36.43	38.88	38.15	32.94	33.01	33.01

E. Average Retail Prices of Locally Produced Goods from The Hypothetical Basket of Goods

	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20
Sugar	35.11	35.11	35.11	35.58	35.58	35.40	35.40	35.40
Edible oil	43.38	45.00	43.36	45.50	44.36	44.11	44.11	44.11
Tea	170.81	171.95	172.89	176.79	175.70	174.62	174.28	174.08
Macaroni	18.38	18.38	18.38	18.38	18.38	18.38	18.38	18.38
Canned peas	24.91	24.66	24.91	24.87	25.25	25.25	25.25	25.83
Frozen chicken	191.88	191.88	191.88	191.88	192.25	184.50	192.25	197.63
Frozen fish	206.25	213.00	206.25	213.00	213.00	213.00	213.00	213.00
Laundry powder	239.20	239.20	239.20	249.25	245.65	249.25	243.35	244.98
Toilet soap	24.10	23.26	24.28	24.66	23.73	24.81	24.46	24.44
Tissue paper	74.42	76.27	73.25	76.27	76.27	75.93	75.76	78.70
Sanitary pads	34.18	34.18	34.37	36.25	34.80	29.34	29.43	29.43
Total	1,062.60	1,072.87	1,063.87	1,092.42	1,084.98	1,074.58	1,075.67	1,085.96