Essential Facts about Inflation

by

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FOREWORD

The Bank of Jamaica has undertaken to publish a series of pamphlets on topics that are integral to the policies and operations of the Bank.

The pamphlets are designed to enhance the public's understanding of key central banking issues. In this regard the pamphlets will present important economic and financial information in a manner that will benefit a wide cross-section of users. In particular, it is anticipated that the material presented will assist journalists, investors, students and other members of the public who frequently request relevant documentation and/or explanations from officers of the Bank.

The Bank and its staff in continuing to serve the Jamaican public are pleased to add these pamphlets to existing publications as we strive to inform and educate.

We take this opportunity to extend our gratitude to all who have supported the process and would like to invite suggestions and comments from all our readers.

Myrtle Halsall (Mrs.)
Division Chief & Head of the Editing Committee
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PREFACE

Inflation is the term used to describe the rate of change in the prices of goods and services over a given period of time. It is therefore an important determinant of the quality of life of Jamaicans. The Central Bank's mandate is the achievement and maintenance of price stability which, in turn, provides an economic environment that is conducive to growth in savings and investment.

This pamphlet examines inflation by first presenting some facts about its measurement, and the effects of inflation on Jamaicans. It uses simple and practical examples to explain the issues concerning inflation. At the end of the paper, an explanation is provided for technical terms that are used in the text.

What is inflation?

Inflation is the continuing increase in the general price level, that is, upward movement in the prices of the majority of goods and services. Inflation may arise from a variety of factors but the basic reason for inflation is having too much money competing to buy the available goods at their existing prices, allowing those prices to rise.

Bank of Jamaica (BOJ), the country's central bank, has the primary objective of ensuring price stability in the economy. In other words, the Bank is mandated to keep inflation in check. But why has BOJ been given this mandate? The ultimate goal of economic policy is to ensure a sustainable increase in the standard of living of Jamaican citizens. Keeping inflation under control to avoid a loss of purchasing power of earnings and savings is an important means to this end. Price stability also makes it easier to plan over relatively long time horizons and therefore encourages saving and investment.

How is inflation measured?

Inflation is measured through the use of the Consumer Price Index (CPI), which captures the rate of price change for goods and services consumed in Jamaica. It is the most widely used indicator of inflation in Jamaica. The Statistical Institute of Jamaica (STATIN) measures the CPI on a monthly basis. The CPI measures the average price change in a selected set of goods and services that is purchased by *the representative Jamaican* in a certain income range. To the extent that the goods and services consumed by each particular individual differ from the set of goods monitored by STATIN, the price changes published by STATIN will not precisely measure the price changes faced by every Jamaican.

STATIN monitors price movements in 288 items that are classified into eight main groups. STATIN sub-divides Jamaica into three geographical strata and calculates CPIs specific to each of these. The divisions are labelled Kingston Metropolitan Area (KMA), Rural Areas and Other Towns. The all-Jamaica Index is derived from these individual indices. *For a more detailed guide to*

How does inflation affect us?

Inflation effectively reduces the quantity of goods that can be purchased with a given amount of money. Since everyone uses money, it means that everyone stands to lose in an inflationary environment. Imagine going to bed one night with a new $1000 dollar bill in your pocket and waking up the following morning to find only $926 dollars. Well, inflation essentially operates in a similar manner, that is, it robs you of your money, but only less obviously. Inflation reduces the quantity of goods that can be purchased with a given amount of money. The higher the inflation rate, the quicker your *purchasing power* is diminished. If Jamaica were to experience an annual inflation rate of 8 per cent for the next three years, then inflation would have robbed individuals of $206.17 dollars out of every $1000 dollars held in cash during the period.

Box 1
Computation of Loss of Purchasing Power

(a) The general formula for calculating a Deflator based on an annual inflation rate of π for α years, can be written as:

$$D = (1 + \pi)^{\alpha}$$

(b) When π is 8% and α is 3 years the deflator is:

$$(1.08)^3 = 1.26$$

(c) The real value of $1000 held for three years is thus

$$\$1,000 / 1.26 = \$793.83$$

(d) Loss of purchasing power after 3 years is

$$\$1000 - \$793.83 = \$206.17$$

Again, inflation does not actually take the money out of our pockets; it robs us by reducing the amount of goods we can purchase with a given amount of money.

How can we defend ourselves against inflation?

Here are two ways in which Jamaicans can seek to protect themselves against inflation.

Secure wage increases through wage negotiations

Workers seek to correct for the effects of inflation by asking that their employers return to them the purchasing power that inflation has robbed them of and then requesting an additional amount for what inflation is expected to take from them in the future. The higher the inflation rate, the higher the wage rate increase demanded by workers. Because the increased wages paid represent an increase in the input cost to the employer, he will then raise the price of his product. This may then cause increases in the prices of other products and further demands for compensatory increase in wages. Wage and price increases therefore have the capacity to regenerate each other on an almost indefinite basis. This process whereby one round of price increases results in several subsequent rounds of price increase is referred to as an *inflation spiral*. As such, negotiations for excessive wage increases are not usually a sustainable means of hedging against inflation.

Investments

Jamaicans can also avoid the effects of inflation on the value of their financial asset holdings by making sound investment decisions. Unfortunately, not many Jamaicans have this option available to them, as it requires parting with money for a period of time in order to reap the benefit later. From the example cited above, we calculated that everyone would have lost $206.17 dollars out of every $1000 dollars held based on an annual inflation rate of 8 per cent over a three-year period. Let us further imagine that there is a merchant bank offering to pay a 10 per cent annual interest rate for deposits of at least $1000 dollars held for three years. Jamaicans who can take up this option will receive an additional $331 dollars from the merchant bank at the end of the three years, which would more than compensate them for the amount that was taken by inflation. In fact, the *real interest rate* received would be approximately 2 per cent (estimated by subtracting the inflation rate of 8 per cent from the interest rate of 10 per cent offered by the merchant bank).

Box 2
Effects of Inflation on Financial Assets

Generally, the increase in the value of the asset is :

$$R = Y(1 + r)^n - Y$$

where

Y is the initial value of the asset
r is the nominal rate of return
n is the number of years

(a) Based on a 10 per cent nominal interest rate for 3 years:

Actual return on \$1,000 = $1000 \times (1.1)^3 - 1000$

= \$331.00

Who is most vulnerable to inflation?

From the arguments above, individuals who are either

- unable to obtain wage increases, or
- unable to take advantage of investment opportunities which offer an interest rate above the inflation rate,

will suffer the negative impact of inflation. Unfortunately, our senior citizens (pensioners) often fall into this ‘fixed income’ group and so are among the most vulnerable to the effects of inflation.

What actually triggers inflation in the economy?

Having discussed how inflation affects us and how we can soften the impact, let us now turn our attention to some of the more common circumstances that will lead to inflation.

Government deficits

Every now and then, we as individuals find ourselves in a situation in which the amount we find it necessary to spend exceeds our income and our available savings. In this situation, we may borrow the necessary funds from a relative, a friend or a financial institution. The Government of Jamaica may also be in a similar position from time to time. When the Government's expenditure exceeds its revenue, the Government is said to be running a *fiscal deficit*. In order to finance this deficit, the Government has the option of either borrowing from Bank of Jamaica or borrowing from local or international financial institutions or from the general public. If the Government borrows heavily from the local sources outside the Bank of Jamaica, it may lead to an increase in domestic interest rates. If the Government borrows from international sources, it might not affect domestic interest rates but would serve to increase the amount of foreign currency the government has to repay in the future. If the Government opts to borrow funds from the Bank of Jamaica to finance its deficit, the process of 'printing money' is said to have occurred. This is not a preferred option as the process inevitably leads to inflation because it represents an increase in money balances without a corresponding increase in the quantity of goods in the economy, that is, more money chasing the same amount of goods.

Rising cost of productive inputs

Inflation also arises out of increases in the cost of *productive inputs*. The price of any final good (or service) will depend upon the cost of the inputs used to produce that good. The more expensive the inputs are to the producer, the higher the cost to the consumer. This therefore means that continued increases in the cost of productive inputs would result in continued increases in the price of the good and hence inflation. For many goods produced in Jamaica, the cost of imported productive inputs represents a major portion of the productive input costs. Variations in the cost of imported inputs are highly dependent on

- the price of the imported input from the overseas suppliers and
- movements in the exchange rate

Box 3
How the Exchange Rate affects Inflation

The Jamaica exchange rate tells us how many Jamaican dollars are needed to purchase one United States dollar (US$1). When that price increases, our currency is said to have depreciated in value – that is, it takes more J$ to buy each US$. In this case, each imported input costs more Jamaican dollars and results in a higher cost to consumers of the final goods. The converse is also true where any decrease in the exchange rate would signify an appreciation in the value of the Jamaican dollar, as fewer Jamaican dollars would be needed to purchase US$1. This would imply a lower cost of imports to producers and lower prices to consumers. More than half of the goods regularly purchased by consumers are sensitive to changes in the exchange rate.

How does the Bank of Jamaica manage inflation?

The Bank of Jamaica depends on its monetary policy to manage inflation. In formulating this policy, the Bank establishes a *Financial Programme*, which outlines movements in key economic variables, which are consistent with the specified inflation objectives of the Bank. These variables are subsequently monitored on an annual, quarterly, monthly, weekly and even daily basis, as data availability allows.

The Bank's *monetary policy framework* embraces four stages of policy design and monitoring. These are

(a) Monetary Policy Instruments (open market operations and reserve requirements)
(b) Operating Targets (monetary base and interest rates)
(c) Intermediate Targets (**exchange rates and money supply**)
(d) The objective of monetary policy (**price stability**)

For more details on the design and implementation on monetary policy, see Pamphlet No. 1. In addition, Box 4 outlines the link between foreign exchange market management (a critical part of monetary policy implementation) and the management of inflation.

Box 4
Why does the BOJ Intervene in the Foreign Exchange Market?

The Bank of Jamaica intervenes in the foreign exchange market in order to eliminate excess demand for or excess supply of foreign exchange.

In doing so, the Bank seeks to avoid rapid appreciation or depreciation in the market-determined exchange rate. As mentioned previously, the cost of imported productive inputs is directly affected by the foreign exchange rate. The more Jamaican dollars required to purchase US$1, the greater the cost of productive inputs in terms of Jamaica dollars. It is for this reason that relative stability in the foreign exchange market is such an important aspect of the Bank of Jamaica's low inflation objective as continued depreciation in the value of the Jamaican currency will eventually lead to increasing inflation.

Major misconceptions about the merits of inflation

Despite the achievement of price stability in recent times, there has been no corresponding growth in the economy. Are Jamaicans being asked to sacrifice too much in order to maintain these low price levels? Should Bank of Jamaica be contemplating allowing inflation to rise 'a little bit higher' and hope that this will stimulate economic activity?

Can we achieve 'a little more' inflation?

It is an extremely risky task on the part of the Bank of Jamaica to allow inflation to increase even 'a little bit higher'. In order to increase in the inflation rate, the Bank would have to loosen its monetary policy by expanding the monetary base and hence influence an increase the amount of money in circulation. Now, the level of increase in the inflation rate would depend on the rate of increase in money supply. However, attempts to allow the inflation rate to increase by only two or three percentage points by allowing the money supply to increase by three percentage points could very well lead to greater than expected inflation out-turns. This mapping of money supply and inflation, but also because of external shocks and market expectations.

Exogenous Shocks

An exogenous shock to inflation is an unanticipated drastic change in a factor that influences inflation over which the central bank has no control. An example of an external shock is the sharp increase in world oil prices during 1999 as OPEC agreed to restrict the supply of oil on the world market. An example of a domestic supply shock would be a severe drought affecting yam farmers in Trelawny. Such an event would increase the general level of prices in Jamaica via sharp increases in the price of yams.

Market Expectations

Probably the most powerful, if unpredictable, factor affecting the capacity of monetary policy to manage inflation is market perception about future movements of key economic variables such as inflation, interest rates, growth, etc. As mentioned above, in a highly inflationary environment, workers seek to hedge against inflation by demanding excessive wage increases because they expect inflation to remain high in the near future. This action in itself would fuel inflation further and serves only to make a bad situation worse. If, however, the market (workers) were convinced that the price level would be maintained at low levels in the future, they would more willingly settle for lower wage increases and this would help to ward off further inflationary increases in the future. The market uses past performance in forming expectations about future prices. In this regard, the signing of single-digit wage settlements in recent times has been possible because of several consecutive years of low inflation that helped to lower the public's expectation of future price movements.

If Bank of Jamaica allowed the inflation rate to be higher, the market might perceive this to be a weakening of the Bank's commitment or ability to contain price movements. The market might then expect further increases and therefore negotiate for excessive wage settlements. This in itself, could result in a higher than planned inflation rate.

Will inflation stimulate sustained growth?

The argument that higher inflation would stimulate economic activity is inconsistent with the empirical evidence gathered from a number of countries. It is true that increased employment is initially associated with an increase in the inflation rate. However, this increased employment is only sustained while the inflation rate is increasing and is eliminated once price stability is subsequently achieved. Since an economy cannot be inflated indefinitely, there is no sustained benefit to be derived from allowing more inflation.

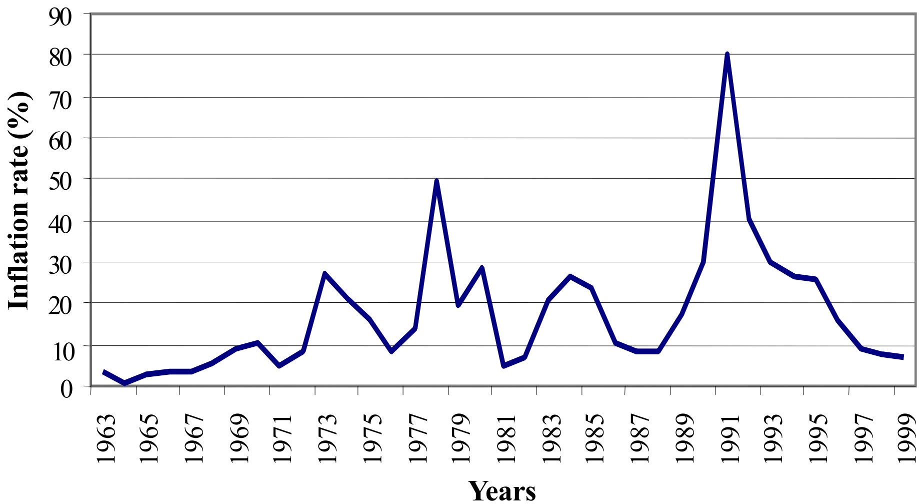
While this transitory increase in employment is occurring, the loss in purchasing power that we discussed earlier would be permanently affecting a wide cross section of the society, especially the poor and those dependent on a fixed income. The social implications of this process could be disastrous. A policy of keeping inflation low and predictable helps to avoid these problems.

Maintaining a low inflation rate

Once price stability is being maintained, events that would normally lead to sharp increases in a highly inflationary environment become generally less catastrophic. To this extent, it is generally easier to maintain inflation at lower rates than it is to arrest and reverse inflation after it jumps to a higher rate.

To illustrate this point, let us compare the impact of exchange rate depreciation on inflation in a high inflation period (1991-1993) and a period of low inflation (1997-1999). It was earlier explained how exchange rate depreciation resulted in inflationary tendencies. During the first period above (1991-1993) the depreciation in the foreign exchange rate of 56.4 per cent over the period was associated with an average of annual inflation rate of 49.1 per cent. Yet, during the second period (1997-1999), the exchange rate depreciation of 18.3 per cent was associated with average annual inflation rates of only about half of that amount (8.1 per cent). The explanation is that, in the latter period, merchants operating in a tight monetary environment, characterised by low and stable inflation, found it difficult to pass on increases in input costs brought about by a depreciation in the exchange rate. They were reluctant to pass on the costs to the consumers out of fear that the goods might not be sold at the higher prices.

The Jamaican Inflation Experience Since 1963
Annual Inflation Rates
(1963 - 1999)



The chart above shows the annual inflation rate in Jamaica from 1963-1999. Three distinct trends in annual inflation rates are observed over the period.

From 1963-1990, there was a steadily increasing trend in the inflation rates, which moved from 3.2 per cent to 29.8 per cent per annum during the 28-year period.

During 1991-1992, the inflation rate recorded sharp changes; increasing to 80.2 per cent in 1991 and then decreasing to 40.2 per cent in 1992. These sharp changes coincided with the liberalisation of the financial system in September 1991, which resulted in the removal of foreign exchange, trade and capital controls. From 1993-1999, the inflation rate fell steadily with three consecutive years of single-digit inflation being achieved in 1999 for the first time since 1969.

The Sixties

During 1960-1969, Jamaica recorded consecutive single digit inflation rates at an average of 4.1 per cent annually. A particularly challenging year for Jamaica during that period, with respect to maintaining price stability, would have been in 1967. In that year, there was a 14.3 per cent devaluation of the Jamaican currency, an extended period of drought and a notable increase in the unemployment rate, with a concomitant increase in the demand for skilled labour. Despite the challenges, however, inflation was recorded at only 3.6 per cent.

The Seventies

Jamaica's inflation rate picked up significantly during the seventies as an average annual inflation rate of 17.8 per cent was recorded for the period 1970-1979, with a peak at 49.4 per cent in 1978. During the decade, there was a sizeable increase in world oil prices, lagging domestic production in important sectors and a marked deterioration in the balance of payments, which were somewhat alleviated by increased tax revenue from the introduction of a bauxite levy. Exchange rate changes and disruptions to the supply of consumer goods therefore triggered much of the inflation in the latter half of this period.

The Eighties

The annual inflation rate was more moderate from 1980 to 1989 relative to the 1970s and averaged 15.6 per cent. The highest rate of inflation for the decade was recorded in 1980 at 28.6 per cent. Although Jamaica was experiencing an acute shortage of foreign exchange, external factors were deemed to have had the most significant impact on the price level during 1980. Along with a shortage of local food supplies due to Hurricane Allen, there was a considerable increase in imported input costs because of higher inflation rates among Jamaica's major trading partners relative to 1979 and because of a second round of major increase in world oil prices.

Over the period 1984-1988, the inflation rate fell from 26.8 per cent to 8.6 per cent. Contributing factors to this moderation over the five-year period, were

- Relatively stable exchange rates;
- Wage guidelines limiting the increase granted on public sector claims

- Controls on the volume and types of credit to the private sector;
- A general decline in the price of oil on the world market and
- A general decline in the inflation rate of major trading partners (United States, United Kingdom and Canada).

The Nineties

The decade of the 1990s was probably the most challenging period for the Bank of Jamaica in terms of achieving price stability. Inflation averaged 27.2 per cent per annum over the period 1990 - 1999. The highest twelve month point-to-point inflation rate recorded in Jamaica's post-Independence history was 80.2 per cent in 1991 after the country implemented a liberalised foreign exchange market regime in September 1990 and removed capital controls in September of 1991. (The 12-month peak was 107.9% in April 1992). Deregulation of prices, however, had started as early as 1990.

The monetary policy of the Bank of Jamaica was geared towards significantly reducing inflation from its peak in the early 1990s. The most significant challenge to monetary policy in the post-liberalisation period was the financial sector crisis, which became apparent in 1996, but which coincided with the end of the high inflationary period of the early 1990s.

High inflation rates generally distorted the price signals in the new market economy and very easily resulted in poor risk-assessment by managers, as business ventures appeared to be better off than they actually were. These 'profitable' firms became complacent and were less inclined to increase the efficiency of their operations as their inefficiencies were masked behind the walls of high inflation. With the steady and sustained reduction of low inflation rates, the inefficiencies of the businesses were exposed and the weaker entities were no longer able to compete. This resulted in the closure or restructuring of approximately half of the institutions within the financial system. At the end of June 2000, that restructuring process had been virtually complete. However, the cumulative cost to the public sector had consumed resources that might otherwise have been channelled into other uses. A more conservative approach to administering bank credit also emerged and these factors tended to retard broad economic growth in the latter half of the 1990s.

Concluding remarks

There is no sustained benefit to be gained from allowing higher inflation rates. Although growth has eluded the Jamaican economy in the 1990s, an economic climate of low, stable prices is a necessary foundation for future growth on a sustained basis. Achievement of this objective should provide the basis for renewed confidence on the part of investors as interest rates are expected to decline, thereby serving as the stimulant for productive investment and ultimately long-term economic growth.

Glossary

Exogenous shock: An unanticipated drastic change in a variable over which one has no control.

Financial Programme: This refers to the set of monetary, fiscal and exchange rate policy measures designed to achieve specified macroeconomic targets through an integrated system of macroeconomic accounts and behavioural relationships.

Fiscal deficit: The excess of the Government's expenditure over its revenue for a given period of time.

Exchange rate: This rate indicates the number of units of one currency offered in exchange for another. For example a Jamaica dollar/United States dollar exchange rate of 'forty two dollars to one' indicates that forty two Jamaican dollars are needed to obtain one United States dollar.

Inflation spiral: The process whereby one round of price increases results in several subsequent rounds of price increases.

Inflation: The increase in the general price level.

Monetary policy framework: This defines the transmission process through which policy actions taken by the Central Bank make an impact on the final target - inflation.

Productive inputs: These are raw materials and labour used to produce a final good or service. For example, eggs, flour and sugar are used as productive inputs for a cake.

Purchasing power: The capacity of a given amount of money to purchase goods and services. This capacity is eroded by inflation.

Real interest rate: This represents the return on assets after accounting for the effects of inflation on the purchasing power of the return.

Pamphlets in this Series

No.	*Title*	*Author*
1	Monetary Policy Management in Jamaica	Claney Lattie
2	Your Guide to the Jamaican Consumer Price Index	Robert Stennett
3	The Measurement of Money Supply	Michelle Hylton
4	Essential Facts about Inflation	Kevin Harriott
5	How the Foreign Exchange Market Works	Helen McIntosh
6	The Central Bank's Role as Regulator	Courtney Christie-Veitch, and Noel Shippey