Report to Minister of Finance on Breach of Inflation Target
and
Consultation on Breach of MPCC Target at June 2018

Bank of Jamaica
07 August 2018

A. Overview

1. In September 2017, the Minister of Finance and the Public Service set a continuous medium-term inflation target of 4.0 per cent to 6.0 per cent to be achieved and maintained by Bank of Jamaica from April 2018 onwards. In April 2018 and through June 2018, twelve-month inflation fell below the 4.0 per cent lower band of the target. In this context, Bank of Jamaica is required to explain to the Minister of Finance and the Public Service and to the Jamaican public the reasons for the deviation of inflation from this target and the actions it will take to remedy the breach.

2. In the context of its precautionary Stand-By Arrangement with the IMF, Jamaica also committed to a Monetary Policy Consultation Clause (MPCC) in late 2016. Annual inflation in Jamaica at June 2018 fell below the lower limit of the agreed consultation band, which requires Jamaica to consult with the IMF Board on the reasons for the deviation of inflation from the target and the Bank's proposed policy responses.

3. Over the course of the year leading up to June 2018, the Bank's forecasts indicated that headline inflation would remain slightly below the centre of its inflation target, which prompted the Bank to embark on a programme of gradual monetary easing over the year. Signs emerged in the December 2017 and March 2018 quarters that the lower limits of both inflation target bands were at risk. The Bank, in response, eased monetary policy more aggressively and stepped up its communication so as to guide inflation back to the target.

4. The lower outturn for inflation at June 2018, relative to the target, primarily reflected the impact of a stronger-than-anticipated reversal in agricultural prices in the March 2018 quarter, lower-than-forecasted imported inflation and a reduction in the pass-through of oil prices to inflation. Domestic demand conditions were also assessed to be weaker than originally anticipated.

5. While Bank of Jamaica projects that inflation over the September 2018 to December 2018 quarters will remain close to 3.5 per cent (below the lower limit of the inflation target and below the lower limit of the inflation target band of the MPCC), inflation will rise to the midpoint of the target by June 2019 and remain broadly at that level over the medium term. This view is informed by an expected normalization in agricultural prices, higher oil prices and higher domestic GDP growth, the latter driven in part by the accommodative monetary conditions induced by the central bank over the past year. Bank of Jamaica is consequently of the view that the economic programme remains on track. Persistent sluggishness in demand notwithstanding the strong pace of job creation, specific constraints in the monetary policy transmission and the possibility of additional negative inflationary shocks, however, suggest that stronger monetary policy action may be required in the near term.

6. In what follows, section B of this document outlines Jamaica's commitment under the SBA in relation to inflation and the performance of inflation over the period June 2017 to June 2018. Section C summarises the macroeconomic and policy context. The next section (section D) outlines the assumptions underpinning the Bank's inflation forecasts over the relevant policy horizon. These assumptions are used to explain the Bank's monetary policy decisions in 2017 and early 2018 in the next section (section E). Section F then describes the main reasons why inflation fell below the target. The final section summarises the Bank's monetary policy posture going forward.

B. Programme Commitments & Performance

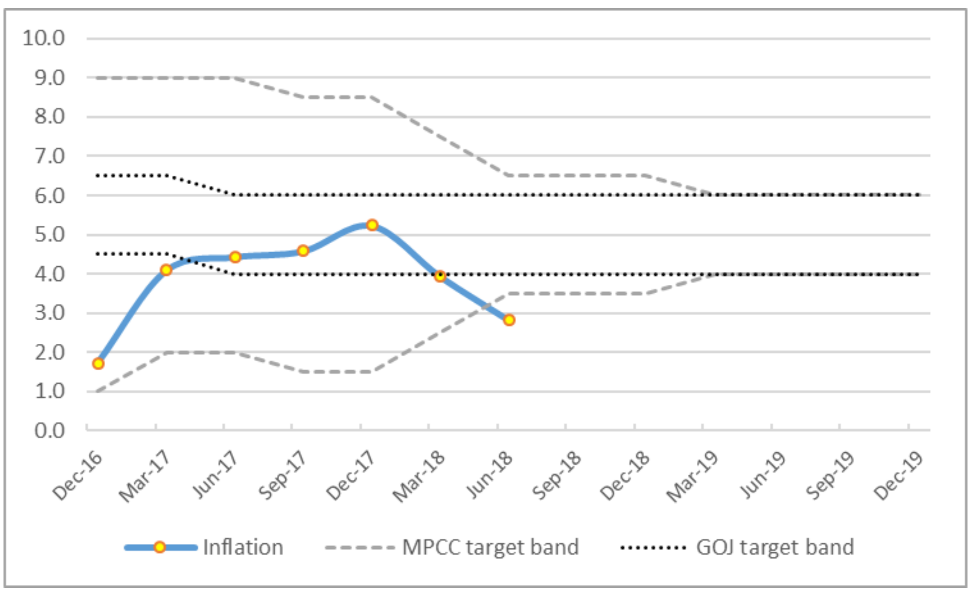
7. **Jamaica in 2016 requested from the IMF a cancellation of the extended fund facility (EFF) that supported its economic reform programme and its replacement with a precautionary Stand-By Arrangement (SBA)**. The precautionary SBA is scheduled to span the

period November 2016 to October 2019. Under the precautionary SBA, inflation targets for the June and December review dates were set under a Monetary Policy Consultation Clause (MPCC).[1]

8. **The inflation targets under the SBA were meant to be adjusted over time.** As part of the Third Review under the SBA, the inflation targets for 2018 were revised from 3.0 per cent to 8.0 per cent to 3.5 per cent to 6.5 per cent and then to 4.0 per cent to 6.0 per cent for 2019. These adjustments were intended to better align and eventually converge the targets under the SBA with the medium-term inflation target set by the Government of Jamaica for Bank of Jamaica. The targets (as specified in the Technical Memorandum of Understanding (TMU) accompanying each Letter of Intent (LOI)) are shown in Figure 1 below.

Figure 1:

Inflation Trajectory and GOJ & MPCC Target Bands



9. **On 16 July 2018, STATIN reported that the annual change in the CPI at June 2018 was 2.8 per cent, below the lower limit of the inflation consultation band.** This outturn for inflation meant that the MPCC had been triggered, which requires Jamaica to consult with the

[1] Inflation in this context is defined as the change over 12 months of the end-of-period consumer price index (CPI), as measured and published by the Statistical Institute of Jamaica (STATIN).

IMF's Executive Board on the reasons for the deviation and the proposed policy response before further purchases can be requested under the precautionary SBA. Specifically, the consultations are expected to explain (i) the stance of monetary policy and whether the Fund-supported programme remains on track; (ii) the reasons for deviations from the specified band, taking into account compensating factors; and (iii) proposed remedial actions, as deemed necessary.

10. **Inflation had also fallen below the lower limit of the GOJ's target from April 2018.** For April 2018 and May 2018, annual inflation was 3.2 per cent and 3.1 per cent. Together with June's 12-month inflation at 2.8 per cent, these breaches require that the Bank explain to the Minister of Finance and the Public Service and to the Jamaican public why the target was missed and propose remedial actions, as deemed necessary.

C. Policy and Macroeconomic Context

11. **Leading up to the period under review, the authorities implemented a number of structural reforms which facilitated improvements in the monetary transmission mechanism.** The Bank's assessment was that the transmission mechanism in Jamaica, particularly the credit channel, had not been performing optimally (see appendix on *The Pass-Through of Bank of Jamaica's Policy Interest Rate to Market Interest Rates*). This was due to a variety of deep-seated structural factors, including fiscal dominance, high and rising dollarization, limited competition in the banking sector, uneven excess liquidity among banks and underdeveloped interbank foreign exchange (FX) and money markets. The gaps in Bank of Jamaica's governance and legislative framework may also have affected the central bank's credibility and muted its policy signals. The reforms in this respect were identified under four pillars, namely (1) macro-financial stability, (2) policy signaling, (3) liquidity management and (4) bond market liquidity.

12. **Reforms aimed at strengthening <u>macro-financial stability</u> dealt with issues of fiscal consolidation, debt sustainability, resilience of the financial sector, financial inclusion and reducing the level of dollarization.**[2] In the context of these changes, the government's overall

[2] Details of reforms aimed at fiscal consolidation, debt sustainability and financial deepening can be found in the Memorandum of Economic and Financial Policies and Technical Memorandum of Understanding accompanying the

debt ratio declined to 118.2 per cent of GDP at end FY2016/17 from 147.0 per cent in FY2012/13, driven mainly by reductions in the fiscal deficit over time. These changes engendered some amount of demand compression in the economy but they also supported a significant reduction in the extent of fiscal dominance.

13. **Most of the initiatives aimed at improving <u>policy signaling</u> have been completed or are in train.** These include the establishment by Bank of Jamaica of an interest rate corridor for private money market interest rates, the introduction of auctions for Bank of Jamaica's interactions with the foreign exchange market, a lowering of the FX surrender requirements and the phasing out of the FX sale arrangements under the Public Sector Enterprise Facility (PSE).[3] Importantly, the legislative amendments aimed at modernizing the central bank by clarifying its objectives, improving its governance and accountability structures and enhancing its financial and operational independence are on track for tabling in Parliament by October 2018. The Government has already defined for the Bank (in September 2017) a continuous medium-term inflation target of 4.0 per cent to 6.0 per cent, which became effective in April 2018. The target was consistent with Jamaica's other medium-term macroeconomic objectives as set out in the FY2018/19 Fiscal Policy Paper that was tabled in Parliament.

14. **Complementary to these initiatives was the introduction of the Bank's <u>liquidity assurance</u> programme.** This involved the introduction of a standing overnight lending facility and a two-week lending facility. To address the problem of **<u>bond market liquidity</u>**, Bank of Jamaica recently began to provide shorter-term Jamaican dollar-denominated instruments to financial institutions in exchange for their longer-dated domestic assets. There has also been improved coordination between the Ministry of Finance and the Public Service and the Bank aimed at improving liquidity management through the Central Treasury Management System.

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various Letters of Intent under the precautionary SBA and the preceding Extended Fund Facility at http://www.imf.org/en/Countries/JAM

[3] The corridor, initially set at 375 basis points at September 2014, was narrowed to 200 basis points at June 2017. With the overnight rate replacing the 30-day rate as the policy rate in July 2017 the spread increased to 300 bps. The introduction of the corridor was designed to guide money market rates in the direction consistent with monetary policy. The foreign exchange market initiatives were designed to reduce the Bank's footprint in the market, enhance transparency and price discovery and promote a reduction in the pass-through of exchange rate changes to inflation.

15. **Another development of note relates to the increased level and concentration of liquidity in the financial system**, which has occurred in the context of (a) the GOJ's programme of fiscal consolidation and deleveraging and (b) the central bank's programme of reserve accumulation.

16. **The economy has reflected relatively weak demand conditions over the past two years and exhibited several features that dampened inflation pressures.** These included (1) susceptibility to repeated weather-related shocks, (2) structural bottlenecks that inhibited credit and business expansion and slowed crowding-in and (3) lower pass-through of international oil prices to domestic energy prices. The main bottlenecks to growth and increasing labour and total factor productivity relate to deficiencies in human capital (poor quality of the labour force due to low levels of education and skills training), high levels of crime (negative relationship between crime and productivity, distortion in investment spending) and poor work ethic.

17. **Notwithstanding these constraints, in the context of the reforms to the economy and the financial system, the economy reflected some improvements between 2015 and 2017.** Real GDP grew by 1.4 per cent in FY2016/17 compared with 1.0 per cent in FY2015/16. The most recent estimate indicates that real GDP for FY2017/18 grew by slightly less than 1.0 per cent. Inflation also reflected a significant decline to 4.1 per cent at end FY2016/17 from 9.1 per cent in FY2012/13. The improvement in the economy was also reflected in increased employment. Over three years to April 2018, employment in Jamaica grew by 88,800 or 7.9 per cent. This was reflected in a 3.5 percentage point reduction in the unemployment rate to 9.7 per cent at April 2018. The labour force participation rate averaged 64.3 per cent, above that which existed over the recent past. In the context of lower inflation and the introduction of Bank of Jamaica's auction-based interactions with the foreign exchange market, the exchange rate exhibited lower levels of depreciation and increased volatility, while market interest rates generally trended downwards in the context of high liquidity in the financial system.

D. Main Assumptions Underlying the Inflation Projections

18. **Monetary policy decisions in Jamaica affect inflation with a lag of between four and eight quarters.** For this reason, monetary policy in Jamaica is forward looking. Bank of Jamaica

puts much effort into establishing its view of the future and bases its monetary policy decisions on this view. The Bank undertakes an assessment of the economy eight times during each calendar year and publishes its decisions in accordance with a pre-announced schedule. On four of these occasions, at a time when most data on the key macroeconomic variables are available, the Bank prepares a comprehensive macroeconomic forecast covering the international economy, the balance of payments, the fiscal accounts, money, credit, financial markets (including the foreign exchange market), the real sector (domestic GDP and prices) and other specific factors which directly affect prices. These forecasts typically do not include any assumption for domestic or international supply shocks. These are evaluated as risks, which are presented to the public in fan charts.

19. **This forecast and policy assessment system (FPAS) implies that the relevant Bank of Jamaica inflation projection for June 2018 and the assumptions underpinning this projection were finalized in the June 2017 quarter.** Growth in the domestic economy for FY2018/19 was projected to accelerate to 2.9 per cent, relative to the expansion of 1.9 per cent for FY2017/18. Over the next three years, the domestic economy was projected to register average growth of 2.5 per cent, consistent with projected continued expansion in the global economy and on-going reforms to improve the competitiveness of selected sectors of the economy (see Table 1). It was expected that Government operations would continue to be restrictive with primary balances of 7.0 per cent of GDP over the medium term to support a continued downward reduction in its debt. The Bank's working assumption was that the exchange rate would adjust over the medium term in line with the difference between inflation in Jamaica and those of its main trading partners. International commodity prices (oil and non-oil) were projected to trend upwards, albeit at a moderate pace during FY2018/19, reflecting the impact of increased global demand for these commodities.[4]

[4] The global economy was projected to expand by 3.5 per cent in 2018, a slight strengthening on the 3.3 per cent projected for 2017 with growth in the USA, Jamaica's main trading partner, expected to accelerate to 2.4 per cent for 2018 relative to the forecast of 2.1 per cent for 2017. Over the medium term, global growth was expected to average 3.5 per cent while the average expansion in the US economy was projected to be 2.3 per cent. In this context, average crude oil price for March 2019 was projected to be higher by 5.6 per cent relative to the same measure for March 2018. The Bank at the time also expected crude oil price to increase, on average, by 2.3 per cent per year over the next three years.

Table 1:

Medium-Term Inflation Forecast and Main Assumptions (at July 2017)

	FY2015/16	FY2016/17	FY2017/18	FY2018/19	FY2019/20	FY2019/21
Inflation	3.0	4.1	4.6	5.0	5.0	5.0
GDP Growth	1.0	1.4	1.9	2.9	2.3	2.4
Treasury Bill Rate (180-day) (eop)	5.8	6.3	6.1	6.1	6.1	6.1
Crude Oil (WTI)	37.96	49.67	48.71	51.46	52.70	54.05
%Change		30.9	-1.9	5.6	2.4	2.6
US Inflation	0.9	2.4	1.4	1.6	1.8	2.0

20. **In the context of these assumptions, the main sources of inflation were anticipated to be higher imported inflation, higher aggregate demand that closes the output gap over the forecast horizon and tax measures to support the GOJ's switch from direct to indirect taxes.** Higher imported inflation was expected to reflect the projected acceleration in oil prices, supported by depreciation in the nominal exchange rate. The Bank assumed that inflation expectations would, however, remain stable.[5]

E. Bank of Jamaica's Monetary Policy Actions and Inflation Forecasts

21. **Since 2014, the Bank has adopted an accommodative monetary policy stance in the face of declining inflation rates and sluggish economic growth** stemming, in part, from the Government's successful drive towards fiscal consolidation. Since June 2017, Bank of Jamaica reduced the policy rate on six occasions. The overnight policy rate was reduced four times by 25 basis points on each occasion to 2.50 per cent at May 2018. Table 2 shows the policy actions that have been undertaken since the beginning of 2017.

[5] This assumption was based on results from surveys of business establishments which showed that expectation for inflation generally remained constant over the period July 2015 to Jun 2017. The Bank commissions eight surveys per year.

Table 2: Bank of Jamaica's Monetary Policy Decisions (2017 & 2018)*

Announcement Dates	Policy Rate (%) 30-Day CD	Policy Rate (%) O/N CD	Change (ppt)
09 February 2017	5.00	n/a	0.00
29 June 2017	4.75	n/a	-0.25
01 July 2017	n/a	3.75	n/a
24 August 2017	n/a	3.50	-0.25
22 November 2017	n/a	3.25	-0.25
20 February 2018	n/a	2.75	-0.25
27 March 2018	n/a	2.75	0.00
16 May 2018	n/a	2.50	-0.25
27 June 2018	n/a	2.00	-0.50

* On 01 July 2017, the Bank changed its policy rate from the 30-day rate to the overnight rate

22. **This repeated easing of monetary policy was the outcome of the Bank's forecasts over the year which consistently pointed to inflation falling in the lower part of the Bank's 4.0 percent to 6.0 per cent inflation target.** Figure 2 illustrates the Bank's near-term forecasts for inflation at each of the four forecast rounds over the year.[6] The Bank's steady approach to easing

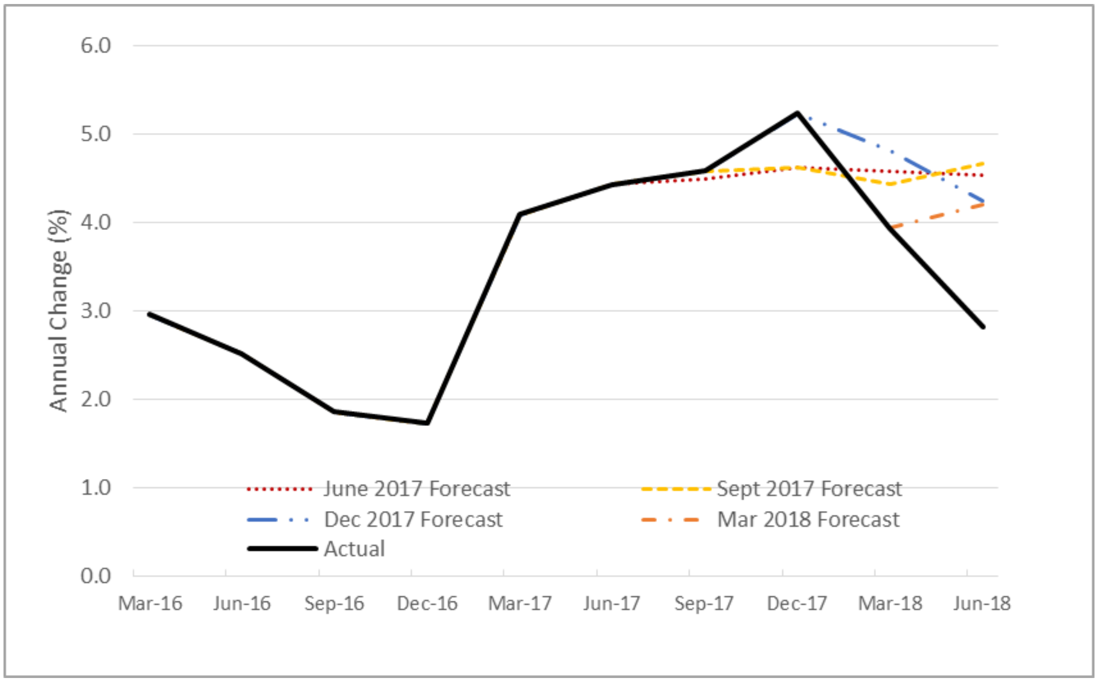
[6] At the June 2017 forecast round, inflation was projected to rise to 4.4 per cent at June 2017, relative to 4.1 per cent at March 2017, due primarily to Government of Jamaica's announced revenue measures and the impact of the projected rise in crude oil prices. Inflation was also anticipated to accelerate because of the effects on agricultural prices of bad weather in May 2017. Over the ensuing three quarters, inflation was projected to remain relatively stable, ending June 2018 at 4.6 per cent, due mainly to the dissipation of the effects of the revenue measures implemented in the previous year. The Bank held the view at this forecast round that the balance of risks to the inflation outlook was even. While risk from the external economy was perceived to be skewed to the downside, there were upside risks to inflation from private capital outflows.

The projections at the September 2017 forecast round (up to June 2018) remained broadly similar to the previous forecast, accounting only for the slight positive surprise to inflation in the September 2017 quarter from higher than expected unprocessed food prices. The Bank held the view at this forecast round that risks to the inflation forecast were skewed to the downside. Demand conditions at the time appeared to be restrained by fiscal conditions.

For the December 2017 forecast round, the impact of adverse weather in October and November 2017 on agricultural prices led to a spike in inflation to 5.2 per cent at December 2017. In this context, the updated forecast anticipated a normalization in these prices in the March and June 2018 quarters. The Bank's view of inflation at June 2018 was consequently adjusted down to 4.2 per cent from the 4.7 per cent previously anticipated. This view was maintained at the March 2018 quarter because the Bank had not anticipated the impact of an anomalous decline in the power company's fuel rate and overall tariff in the context of rising oil prices. The Bank also held the view at this forecast round that the risks to the inflation outlook were balanced.

monetary conditions reflected the view that economic growth was projected to accelerate, notwithstanding structural bottlenecks in the economy. Additionally, external financial conditions were tightening which could have precipitated capital flight and increasing dollarization.

Figure 2: Inflation: Actual versus Projected Trajectory



23. In signalling its increased concern about the future path for inflation, the Bank reduced the policy rate more aggressively by 50 basis points in June 2018 to 2.00 per cent. The Bank also changed the tone of its communication to reiterate its view of the economy and future inflation. When adjusted for expected inflation, the real policy rate became very negative in a context of high liquidity in the financial markets.[7] The Bank's decision in June 2018 to accelerate its accommodative policy stance was aimed at fostering greater credit expansion and a faster pace of GDP growth to support inflation returning to the target of 4.0 per cent to 6.0 per cent over the medium term.

The Bank's medium-term projections over all the projection rounds held that inflation, conditional on an appropriate monetary policy posture, would rise gradually to the midpoint of the target range by March 2019 and remain broadly at that rate in the medium term.

[7] Expected inflation one year ahead is proxied by the Bank's unconditional inflation forecast.

F. Why Did Inflation Breach the Target?

24. The lower outturn for inflation relative to the target at June 2018 primarily reflected the impact of

i. Stronger-than-anticipated food price reductions in the March and June 2018 quarters;

ii. Lower-than-forecasted imported inflation associated with a strengthening currency and a reduction in the pass through of oil prices to inflation; and

iii. Weak domestic demand conditions.

25. **A sharper-than-expected recovery in agricultural supplies following production disruptions in late 2017 caused unprocessed food prices to fall in the March and June 2018 quarters by more than had been anticipated by the Bank**. For the first half of the calendar year, unprocessed food prices (as measured by STATIN's *Vegetable and Starchy Foods* sub-division) fell by 9.4 per cent, relative to prices at December 2017. In the context of the projections for agricultural supplies, the Bank had projected at the December 2017 forecast round that this sub-index would have declined by 3.4 per cent.[8]

26. **Imported inflation for the first two quarters of 2018 is estimated to have been lower than that in the same period of the previous year.** This partly occurred in the context of a strengthening of the Jamaican dollar. At May 2018, the six-month average of the bilateral (JMD/USD) exchange rate appreciated by 2.0 per cent, relative to the same measure at May 2017.[9] Similarly, the JMD/USD exchange rate at the end of May 2018 appreciated on an annual point to point basis by 1.7 per cent, compared with the Bank's broad expectation for a **depreciated** nominal exchange rate over the year, in line with the relevant inflation differential (see Figure 3).

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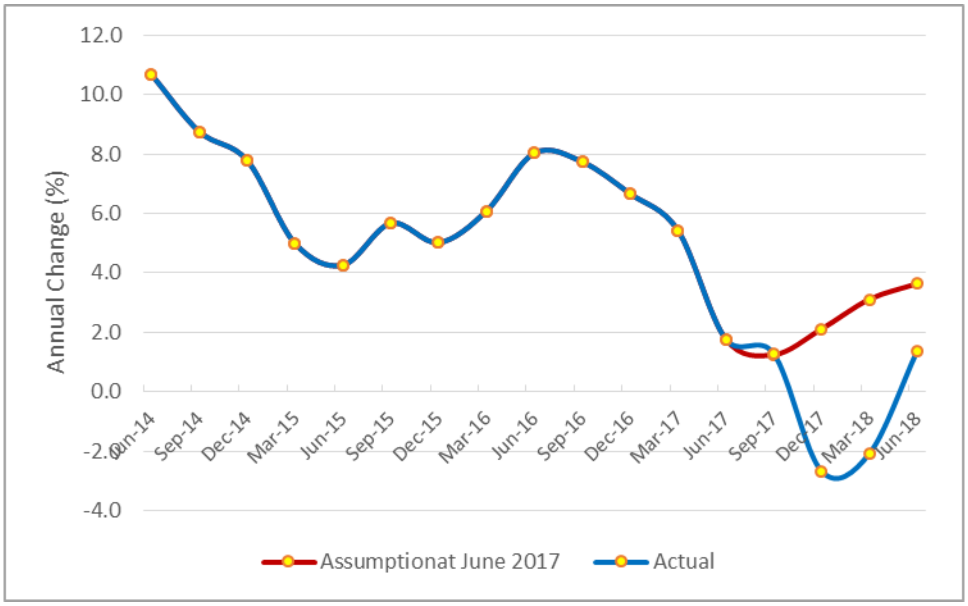
[8] Expectations about future developments in non-processed food prices are informed by forecasted supply trends from the Ministry of Industry, Commerce, Agriculture & Fisheries and the Rural Agricultural Development Agency.
[9] The assessment stops at May (and not June) because of the assumption that the exchange rate pass-through affects domestic prices with a lag of at least one month.

Figure 3:
Exchange Rate Change (JMD/USD):
Actual versus Assumed



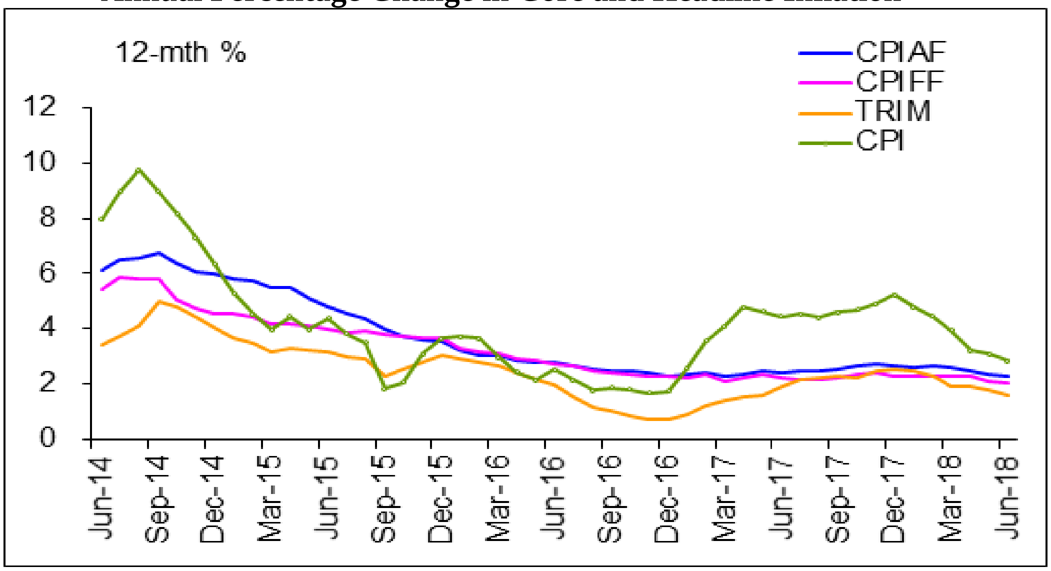
27. **Lower imported inflation also emanated from a smaller-than-anticipated pass-through of oil prices to domestic inflation.** The average of monthly crude oil price increases over the year to May 2018 accelerated to 3.0 per cent, compared with 0.5 per cent over the previous year to May 2017 and 0.1 per cent expected by the Bank. In contrast, the average of monthly changes in the fuel charge in electricity rates (in US$) fell to 1.8 per cent over the year to May 2018, compared with 6.3 per cent in the previous year. This implied that the pass-through from international oil prices to electricity rates fell significantly over the 12-month period. Some of this weakening was related to an anomalous decline in the power company's fuel rate in April 2018, made more so in the context of rising oil prices during that period.[10]

28. Core, or underlying, inflation also remained subdued over the year, indicative of weak domestic demand conditions. The Bank's main measure of core inflation (inflation that excludes the immediate influence of agriculture and energy prices - referred to as CPIAF) remained firmly below 3.0 per cent since April 2016. At June 2018, the annual change in the CPIAF was 2.3 per

[10] Pump prices were affected by taxes implemented between May 2017 and May 2018. Consequently, the average monthly change in pump prices were 14.1% and 11.1%, much higher than the observed changes in external energy prices.

cent relative to 2.4 per cent at June 2017 (see **Figure 4**). All the other measures of core inflation also remained relatively low and stable.

Figure 4:
Annual Percentage Change in Core and Headline Inflation



29. **Weak aggregate demand conditions in 2017 were driven primarily by ongoing fiscal consolidation and less-than-favourable external demand conditions.** The weak state of domestic demand was largely evident in a slower pace of growth in net external demand in 2017, relative to 2016. This was consequent on a faster pace of growth in imports over the year, which offset an increase in real exports.[11] Moreover, the spillovers from investment spending to the rest of the economy remained constrained.

G. The Path Back to the Target & Conditional Monetary Policy Posture

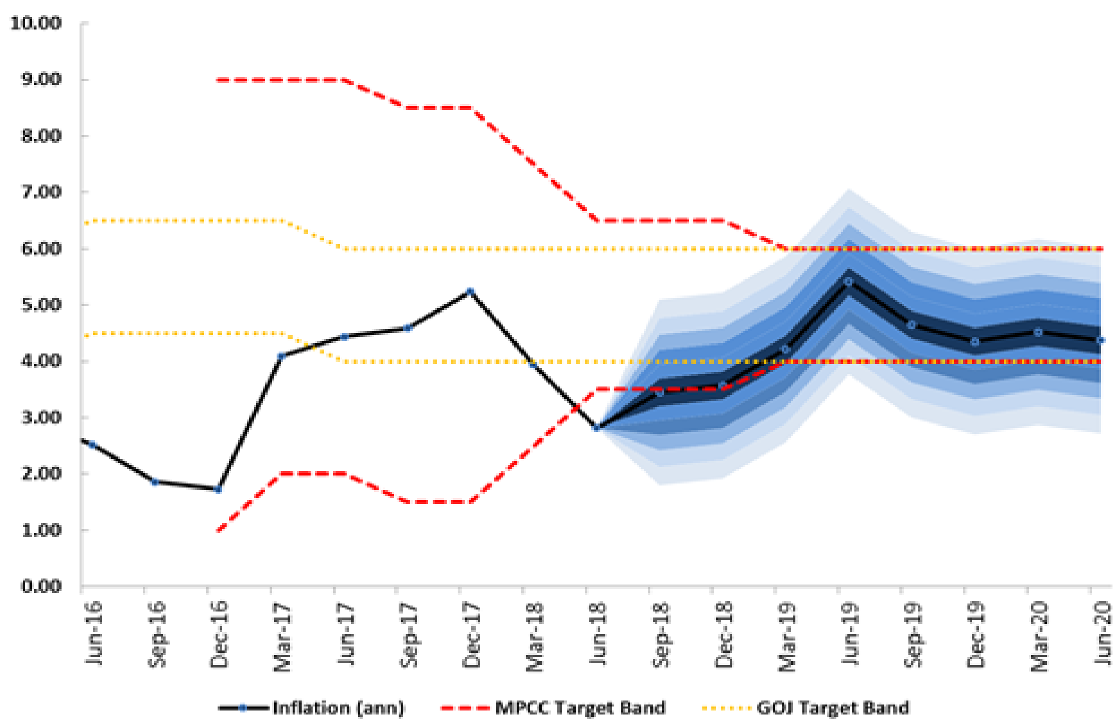
30. **Bank of Jamaica projects that inflation over the September 2018 to December 2018 quarters will remain close to 3.5 per cent,** due in part to the base effect of the low CPI at June 2018 (see **Figure 5**). Inflation is projected to rise to above 5.0 per cent (the midpoint of the target) by June 2019 but subside to the lower half of the target band over the medium term. The projected path for the annual inflation rate over this period is consistent with an average monthly inflation

[11] The faster pace of growth in imports was evident for raw materials, fuel and consumer goods.

rate of 0.4 per cent, slightly higher than the monthly average of 0.3 per cent over the most recent eight quarters. Therefore, Jamaica may again trigger the MPCC at the December 2018 SBA review, since the impact of the most recent monetary policy adjustments on inflation will be largely ineffective over this time horizon. The future path for inflation will be influenced by the lagged effects of (1) the rate cuts of the last 12 months plus (2) any action taken at the next decision date (27 August 2018). Recent cuts and further actions will therefore not have an effect on the inflation rate until the September 2019 quarter.

Figure 5

Projected Inflation Path (Sept 2019-Jun 2020)



31. **In a context of an unchanged monetary policy over the forecast horizon, the inflation trajectory is driven primarily by (1) a normalization in domestic agricultural commodity prices (2) higher imported inflation and (3) the effect of higher economic activity**, given the

accommodative monetary conditions induced by the central bank over the past year.[12] Consistent with their seasonal patterns and the outlook for an intensification of dry conditions during the September 2018 quarter, agricultural supplies are expected to fall over the near term, relative to the June 2018 quarter. This reduction will support higher vegetable and starchy food prices in the September and December 2018 quarters. The recent upturn in crude oil prices is also expected to affect domestic energy prices. The forecast is for elevated international oil prices at around US$70 per barrel for the remainder of 2018 in the context of geopolitical tensions. This implies an increase of approximately 30.0 per cent in oil prices for FY2018/19, followed by a normalization to an average of about US$64.00 per barrel in FY2019/20. GDP growth is projected to approximate 2.0 per cent over the next eight quarters, an acceleration relative to the 1.2 per cent realised over the last two years. Much of this acceleration is related to the restart of a plant in the mining sector.[13]

32. The other assumptions underlying the medium-term inflation forecast are as follows:

a. Continued gradual recovery in the world economy. The US economy should continue to grow strongly over the next three years.

b. International financial conditions are projected to tighten further as the US monetary authorities increase their policy rate.

c. The Government of Jamaica's fiscal stance is expected to remain restrictive.

33. Bank of Jamaica has undertaken a number of policy adjustments that will help to guide inflation, over time, back into the target band. The Bank's analysis is that the factors responsible for shifting inflation below the target, though somewhat ameliorated, still persist. Notwithstanding, it is the Bank's view that the economic programme remains on track. The problem of uneven excess liquidity within the financial system remains a constraint to the effectiveness of the transmission mechanism. There is also the possibility that additional negative

[12] Given the risk for adverse weather shocks, there is a risk that unprocessed food prices could increase by more than is being anticipated. The higher imported inflation is predicated on the projection for increases in oil price, offset by an assumed lower pass-through (relative to history) to domestic energy prices.
[13] Abstracting from the effects of this plant, the Bank projects average GDP growth of 1.7 per cent over the period.

inflationary shocks may adversely affect inflation in the future. Low core inflation, symptomatic of weak domestic demand, will need to accelerate in the context of the pickup in economic activity to approximately 3.5 per cent, to be consistent with the midpoint of the target bands.[14] **With the continued slow pace of economic expansion, notwithstanding the strong pace of job creation, these factors may require stronger monetary policy action in order to overcome them in the near term.**

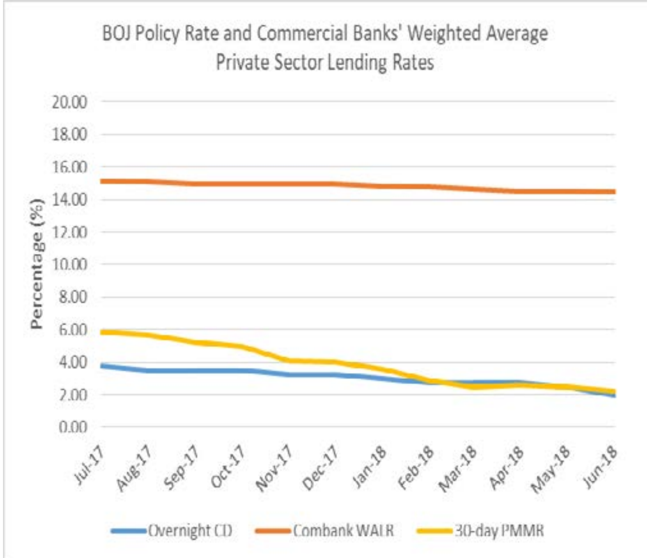
[14] The average level of core since April 2016 is 2.5 per cent.

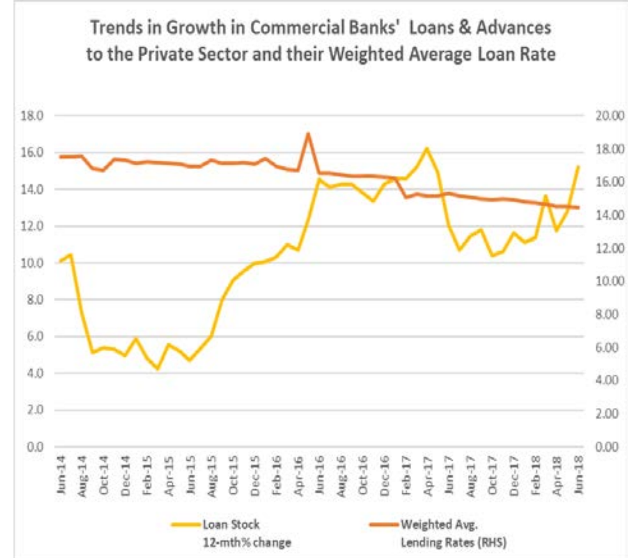
Appendix: The Pass-Through of Bank of Jamaica's Policy Interest Rate to Market Interest Rates

1. Bank of Jamaica conducts monetary policy with the objective of attaining its inflation target. The impact of changes in Bank of Jamaica's policy interest rate on the economy depends on the effectiveness of the transmission channel from the policy rate to the prices of goods and services. This transmission is through two channels: the credit channel and the exchange rate channel. The conventional view of the monetary transmission process through the credit channel is that a change in the Bank's policy rate influences money market interest rates, which then affects deposit and lending rates in the banking system, which changes credit flows, consumption and investment decisions, economic activity and, finally, the prices of goods and services. This appendix presents an overview of recent research on the pass-through from Bank of Jamaica's policy rate to bank lending rates. The overarching conclusion is that the pass-through to bank interest rates is weak.

2. Interest rate pass-through for the purposes of this note describes how changes in central banks' policy rates are transmitted to interest rates on loans and deposits. Estimates of pass-through coefficients diverge significantly across countries, markets and time. In the Jamaican context, the effectiveness (speed and size) of the pass-through of the transmission process has been less than optimal, particularly when compared to other countries.

3. The data suggest that, while money market rates in Jamaica have shown a clear response to the policy rate, lending rates appear to have been sluggish in response to monetary policy signals. However, there has been a noticeable growth in loans and advances despite the slow downward adjustment in the lending rates. The graph below shows the Bank's overnight policy rate, the weighted average lending rates of the commercial banks and 30-day private money market rates.





4. Foga and Murray (2013), using a vector autoregressive (VAR) model, showed that changes in the policy rate were transmitted to Treasury bill rates immediately.[1] Their results showed that an increase of 1 percentage point (ppt) in Bank of Jamaica's policy rate led to an immediate rise of between 0.02 ppt to 0.06 ppt in Treasury bill rates.

5. Dacass *et al* (2015) examined the other aspect of the transmission, which involves the pass-through of market interest rates to deposit and lending rates.[2] Their results confirmed that there was incomplete pass-through of money market rates to some loan rates.[3] In addition, there is some evidence that the pass-through is different for different segments of the credit market. The pass-through to corporate loans with maturities of 12 months and over was found to be almost complete while it was incomplete for personal loans. Specifically, it takes one year for most of the change in market rates to pass through to corporate loans (95 per cent) and personal loans (75 per cent)

[1] Foga C & Murray A (2013), A Proposed Framework for Monetary Policy Implementation in Jamaica: Transitioning to a Full-Fledge Inflation Targeting Regime, Unpublished work

[2] This was based on Dacass *et al* (2015), A Micro-econometric Examination of the Monetary Transmission Mechanism in Jamaica. Bank of Jamaica working paper

[3] Full or complete pass-through is characterised by a situation where a one to one change in the lending rate results from a change in the market rate, usually within a year. It is characterised as 1.0. The pass-through is defined as incomplete when the coefficient is less than 1.0 while more than 1.0 means a pass-through greater than the initial change. A pass-through of 0.3, for example, means that 30 per cent of the change in the market rate is transmitted within a year to the lending rate

when bank-specific and market-specific variables were controlled for.[4,5] With the exception of time deposits, interest rates on deposits appear to be sticky in the context of changes in the policy rate. Savings and demand deposits reflected pass-through of 37 per cent and 41 per cent, respectively, to market rates while pass-through on time deposits with maturities of 12 months and over was complete.

6. Overall, the finding of Dacass *et al* (2015) was that Bank of Jamaica's policy signals transmit more quickly and efficiently to market rates if the financial system is diversified. The paper suggested the need to pursue policies that reduce the concentration of deposits and market power in order to improve the pass-through.

7. A similar assessment by the IMF illustrates the weak pass-through of policy signals to economy wide interest rates.[6] Their results show that a reduction in Bank of Jamaica's policy rate by 1.0 ppt leads to a 0.4 ppt reduction in the rate that banks lend among themselves (the interbank rate) over three months, which is lower than both advanced and emerging market averages. The pass-through from the interbank rate to bank lending rates is even lower, at 0.15 ppt over three months, compared to 0.43 ppt and 0.90 ppt for advanced and emerging market countries, respectively. In addition, the pass-through has been lower in the more recent period (after 2010), which is likely a result of the debt exchanges and their impact on bank liquidity and profit.

8. The results of this recent research point to a weak response of bank deposit and lending rates to monetary policy in Jamaica. Bank of Jamaica has implemented a number of reforms to its operations, such as the introduction of a liquidity assurance mechanism and an interest rate corridor for short-term rates, in addition to enhanced communication, in order to improve the monetary

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[4] These include relative asset size, measures of concentration, exchange rate volatility and the capital adequacy ratio (CAR). The measures of concentration investigated include the relative share of deposits, relative share of excess liquid assets and Herfindahl-Hirschman index on asset size.

[5] The close to complete pass-through to commercial loans was not surprising as the corporate loans market is largely competitive and controlled by commercial banks. Given the level of competition and the market share, the analysis suggests that of the three loan categories offered by commercial banks, the central bank may have a greater impact on corporate loans through changes in monetary policy. Furthermore, this finding indicates that the central bank may be able to influence investment more than consumption decisions.

[6] Published in Jamaica: 2016 Article IV Consultation, Eleventh and Twelfth Reviews Under the Extended Fund Facility and Request for Modification of Performance Criteria-Press Release; Staff Report; and Statement by the Executive Director for Jamaica – 21 June 2016 (Page 25) and can be found at http://www.imf.org/en/Publications/CR/Issues/2016/12/31/Jamaica-2016-Article-IV-Consultation-Eleventh-and-Twelfth-Reviews-Under-the-Extended-Fund-43999

transmission process. However, further analysis and policy actions appear to be required to unclog the transmission mechanism.