DETERMINANTS OF INFLATION

This paper investigates the determinants of inflation during the period 2003–16. The results suggest that both domestic macroeconomic policy and external factors are important determinants of inflation in the long run. In the short run, inflation is highly persistent and money supply, and money supply appears to drive inflation more than other policy factors, such as the exchange rate and fiscal variables. Strengthening the transmission mechanisms of the monetary policy and implementing structural reforms that help alleviate nominal rigidities would help anchor inflation expectations.

A. Introduction

1. Inflation continued to accelerate in 2016. Starting in early 2012, headline inflation picked up following the ramp-up in public spending in the wake of the Arab Spring. In 2013, inflationary pressures subsided, reflecting in part the impact of fiscal consolidation. Since mid-2014, however, inflation has accelerated again, largely driven by higher food prices and a sustained rise in manufactured goods prices, and stood at 6.4 percent on average in 2016. Against this background, the question arises of whether policy factors such as public spending and exchange rate are the key drivers of inflation in Algeria. An empirical analysis of inflation would help assess the contribution of various factors to recent inflation developments.

2. Identifying the main determinants of inflation helps to inform the appropriate monetary policy response to recent inflation developments. During the oil price boom, monetary policy transmission mechanisms were ineffective, in part due to excess liquidity. Since the onset of the oil price shock, however, bank liquidity has decreased sharply and excess reserves have dried up, offering the central bank the opportunity to regain control over liquidity conditions. Going forward, understanding the key drivers of inflation is important for determining the appropriate stance of monetary policy.

3. This paper provides an empirical investigation of the key determinants of inflation. The paper follows an approach commonly used in the literature for oil-exporting countries. It builds an inflation model that incorporates both external and domestic policy factors. Given the nonstationarity in the variables and the existence of possible long-term relationships, this analysis uses a vector error-correction model (VECM).

4. The rest of the paper is organized as follows: The next section describes recent inflation developments and some stylized facts. Section C describes the relevant literature and presents the theoretical underpinnings of the inflation model. Section D describes the empirical methodology. Section E presents the results of the VECM. Section F discusses policy implications.

1 Prepared by Moez Souissi.
B. Recent Inflation Developments and Stylized Facts

5. Prices began to rise rapidly in mid-2014. After a period of sharp inflationary pressures in 2012, average inflation started to decrease in 2013 and remained well below the central bank’s 4 percent central target until the end of 2014. However, beginning in mid-2014, inflation again accelerated gradually, reaching 6.9 percent year on year in December 2016. The acceleration in inflation reflects in large part the sustained rise in manufactured goods prices, which contributed more than 55 percent on average to overall inflation. Core inflation, measured as overall inflation excluding fresh agricultural products and products with regulated prices, also accelerated significantly, rising from 0.4 percent in January 2014 to 4.7 percent in December 2016.

6. In 2016, significant fluctuations in food prices led to a great volatility in overall inflation. Inflation peaked at 8.1 percent in July before subsiding momentarily, then accelerated once again toward the end of the year. The variation in headline inflation was generated by significant fluctuations in food prices. The contribution of food prices to overall inflation peaked at 41 percent in July, declined sharply in following months, reaching 7.5 percent in October, and then increased again to 34 percent in December.
7. Simple scatter plots illustrate that domestic prices do not seem to be highly sensitive to changes in import prices, exchange rate, and monetary conditions in the short run. The charts illustrate the evolution of monthly import prices, the nominal effective exchange rate and broad money, and their impact on core inflation during the 2010–16 period. The slope of each chart depicts the relationship between core inflation and the change in each of the three factors. According to the chart, the short-term pass-through of import prices and the exchange rate are not large, and short-term variations in real money has little impact on core inflation.

C. Relevant Literature

8. The theoretical literature on the determinants of inflation considers both demand and supply side factors. The determinants of inflation are discussed widely in the literature. Fluctuations in the inflation rate are often interpreted as partial adjustment of the actual price level towards a long-term (or equilibrium), which can be analyzed based on a three theories:

- The monetary theory, which is typically associated with Friedman and Schwartz (1963) and views inflation as a purely monetary phenomenon: An increase in the money stock would be followed by an increase in the general price level in the long run, with no effects on real variables such as consumption or output;
The purchasing power parity (PPP) theory, which stipulates that, over the long term, the price of domestic goods equals the price of foreign goods expressed in the domestic currency; and,

The markup theory, which goes back to Duesenberry (1950) and assumes that the equilibrium price level is set as a markup on input prices.

### 9. An extensive body of empirical studies investigated the determinants of inflation for oil-producing countries.

Researchers have employed various techniques to investigate the determinants of inflation in individual countries or regions. These studies have found that inflation can be driven by domestic and external factors in both the short and long run.

- Ben Naceur (2012) analyzes the short- and long-run determinants of inflation in Algeria between 2002 and 2011 using a VECM. The results suggest that only non-oil GDP gap explains inflation in the short run, while money supply and real GDP growth are the most important determinants of inflation in the long run. Sultan (2011) explores the determinants of inflation in Saudi Arabia using an error-correction model (ECM) covering 1980-2008. It finds that world inflation, money supply, and the nominal exchange rate explain inflation in both the short and long run. Klein and Kyei (2009) explores the factors that affect inflation in Angola using a VECM, and finds that domestic prices are mainly affected by the nominal exchange rate. Alavirad and Athwale (2005) looks at the impact of budget deficit on inflation in Iran using a univariate ECM, and finds a significant and positive relationship in the long run between prices and government budget deficit.

- Basher and Elsamadisy (2012) explores the main sources and transmission of inflation in the GCC countries over 1980-2008 using a nonstationary panel data model. Findings suggest that money, foreign prices, and the nominal effective exchange rate are the key determinants of inflation in the short run, while only money affects inflation in the long run. Kandil and Morsy (2009) also investigates the determinants of inflation in GCC countries between 1970 and 2007 using a VECM. The results suggest that prices in major trading partners represent the most important foreign factor affecting inflation, while public capital spending eases inflationary pressures in the long run. In the short run, excess demand appears to be an important determinant of inflation for a number of GCC countries.

### D. Empirical Methodology

10. To determine what drives inflation in Algeria, this study incorporates both external and domestic factors. This study follows the general empirical approach used in the literature described above, reflecting the theoretical underpinnings of the link between domestic inflation and its key determinants, and taking into account the features of Algeria’s economy as well as data availability. It uses quarterly data covering 2003-2016.

11. The inflation model is based on the monetary and PPP theories. The general price level is defined as a weighted average of tradable and non-tradable goods’ prices. The price of non-tradable goods depends on the imbalance between the supply and demand of money. When the
Supply of money outstrips demand, inflationary pressures emerge and the price of non-tradable goods increases. The supply of money is a policy variable, while money demand depends on real GDP levels and interest rates. In Algeria’s case, the data available cover a period of excess liquidity during which interest rates were relatively low and flat. In addition, apart from the oil and gas sector, public spending was the main driver of economic activity. Public spending can therefore be used to reflect changes in the demand for money. Furthermore, as suggested by the law of one price, the price of tradable goods depends on the price of goods produced abroad and the exchange rate. An increase in either the exchange rate (i.e., depreciation) or the price of foreign goods in foreign currency leads to an increase in the price of domestic tradable goods.

12. This study uses a VECM. This type of model can be used to identify the main determinants of inflation in the long run, and to simultaneously analyze the factors underlying its fluctuations in the short run. It also allows for analysis of the contribution to inflation dynamics of the various shocks in the model. Such a model requires a long dataset given the relatively high number of parameters to be estimated.

13. Estimating long-term relationships requires cointegrated variables. The variables used to estimate the VECM must be integrated of order 1 or I(1) (i.e., non-stationary due to the presence of a single unit root) and cointegrated (i.e., there is at least one linear combination of these variables that is stationary). To analyze the stationarity of the variables, several tests can be employed, including the augmented Dickey-Fuller test. Then, the Johansen and Juselius (1990) cointegration test is used to identify possible cointegration relationships. Based on the theories described above, long-term price levels can be represented as follows:

\[ p = f(m2, e, pimport, deppub) \]  

(1)

where \( p \) represents the core price level (measured by the consumer price index excluding the price of fresh agricultural and regulated products), \( m2 \), which captures money supply (measured by broad money excluding the national oil and gas company’s deposits\(^2\)), \( e \) is the nominal effective exchange rate (measured by the dinar’s weighted average exchange rate against the main currencies used to pay for imports, i.e. the US dollar and the euro), \( pimport \) represents the import prices (measured by the weighted average of export prices in foreign currency of Algeria’s main trading partners) and \( deppub \) represents the level of total real public spending. All variables are log-transformed and seasonally adjusted.

---

\(^2\) Algeria’s national oil and gas company (Sonatrach) surrenders 100 percent of its hydrocarbon exports proceeds to the central bank, which credits Sonatrach’s account with one public bank in dinars. The large deposits of Sonatrach contribute significantly to broad money and, in theory, could fuel excess liquidity. However, Sonatrach’s deposits typically carry conservative placement requirements as they serve to finance the heavy investment plans of the company. And the authorities consider that these requirements are effective in preventing the bank which receives the deposits from expanding credit.
14. Short-term deviations from this long-term relationship can be explained by changes in the exchange rate, money supply, import price levels, public spending levels and the output gap. The following equation analyzes the determinants of core inflation in the short term:

\[ \Delta p_t = \beta_1 + \beta_2 EC_{t-1} + \sum_k \beta_{2k} \Delta p_{t-k} + \sum_k \beta_{3k} \Delta e_{t-k} + \sum_k \beta_{4k} \Delta p_{import_{t-k}} + \sum_k \beta_{5k} \Delta m_{2, t-k} + \sum_k \beta_{6k} \Delta deppub_{t-k} + \sum_k \beta_{7k} \Delta outputgap_{t-k} + \epsilon_t \]  

(2)

where \( \Delta \) represents the first difference, \( EC \) is the error correction term (i.e., \( p_t - f(m2_t, e_t, p_{import_t}, deppub_t) \)) used to assess the speed of convergence towards the long term level, \( outputgap \) represents the nonhydrocarbon output gap that can be used to measure the impact of the position in the cycle on inflation\(^3\), \( \epsilon_t \) is the error term, and \( k \) is the number of lags included to minimize the information criteria (e.g., the Akaike information criterion). As explained above, due to limited data availability, this specification covers mainly factors affecting demand, and with the exception of imported goods prices, it does not include structural factors on the supply side due to the lack of sufficiently long and high-frequency time series, including for the cost of factors of production.

E. Results

15. Unit root tests suggest that all variables are I(1). Table 1 displays the results of the augmented Dicky-Fuller unit root test that indicate that all variables are non-stationary is levels but stationary in their first difference.

<table>
<thead>
<tr>
<th>Table 1. Augmented Dicky-Fuller Unit Root Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>( p )</td>
</tr>
<tr>
<td>( m2 )</td>
</tr>
<tr>
<td>( e )</td>
</tr>
<tr>
<td>( p_{import} )</td>
</tr>
<tr>
<td>( deppub )</td>
</tr>
</tbody>
</table>

* and ** and *** denote rejection of the presence of a unit root test at the 10, 5 and 1 percent significance level, respectively.

\(^3\) Output gap is approximated by the deviation of real nonhydrocarbon GDP from its trend, which is obtained using HP filter.
16. There is a unique long-run relationship between domestic core inflation, broad money, total real public spending, NEER and import prices. The Johansen and Juselius (1990) test indicates the existence of a unique co-integration relationship between these variables. The results of the maximum eigenvalue and trace statistics are reported in Table 2.

### Table 2. Johanson and Juselius (1990) Co-integration Tests

<table>
<thead>
<tr>
<th>Hypothesized</th>
<th>Trace Test</th>
<th>0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of CE(s)</td>
<td>Trace Statistic</td>
<td>Critical Value</td>
</tr>
<tr>
<td>None *</td>
<td>0.629980</td>
<td>90.00975</td>
</tr>
<tr>
<td>At most 1</td>
<td>0.352496</td>
<td>41.29405</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.273610</td>
<td>19.99717</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.083263</td>
<td>4.33393</td>
</tr>
<tr>
<td>At most 4</td>
<td>0.001501</td>
<td>0.073606</td>
</tr>
</tbody>
</table>

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

<table>
<thead>
<tr>
<th>Hypothesized</th>
<th>Max-Eigen Test</th>
<th>0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of CE(s)</td>
<td>Max-Eigen Statistic</td>
<td>Critical Value</td>
</tr>
<tr>
<td>None *</td>
<td>0.629980</td>
<td>48.71571</td>
</tr>
<tr>
<td>At most 1</td>
<td>0.352496</td>
<td>21.29688</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.273610</td>
<td>15.66377</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.083263</td>
<td>4.259787</td>
</tr>
<tr>
<td>At most 4</td>
<td>0.001501</td>
<td>0.073606</td>
</tr>
</tbody>
</table>

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
17. **The resulting long-run relationship is as follows:**

\[
p = 0.35 * m2 + 1.19 * e + 0.63 * pimport - 0.49 * deppub
\]

\[\begin{array}{c}
(1) \\
[2.98] \\
[3.08] \\
[2.33] \\
[-4.53]
\end{array}\]

Equation (1) passed all the specification tests.\(^4\) All coefficients are statistically significant and have the expected signs.\(^5\) The results indicate that external factors are the most important driving forces of inflation in the long run. Exchange rate shifts would be fully reflected in domestic prices, while an increase of 1 percent in import prices would translate into an increase of 0.6 percent in domestic prices in the long run. The results also suggest that money supply is another important factor explaining changes in domestic prices in the long run. An increase of 1 percent in the money supply would result in about 0.4 percent increase in the price level. The coefficient of money is much lower than unity (as required by the homogeneity condition), reflecting the extent of price controls in the economy. The results also show that public spending is negatively and significantly associated with domestic prices in the long run. An increase in public spending of 1 percent is associated with a 0.5 percent decline in long-term prices, pointing to potential productivity gains from public spending that support price stability in the long run.

18. **Inflation is highly persistent in the short run.** The short-term inflation equation can be written as follows:

\[
\Delta p_t = -0.00 - 0.03 * EC_{t-1} + 0.36 * \Delta p_{t-1} + 0.15 * \Delta p_{t-2} + 0.08 * \Delta e_{t-1} + 0.04 * \Delta e_{t-2} \\
+ 0.11 * \Delta m_{t-1} + 0.11 * \Delta m_{t-2} + 0.02 * \Delta pimport_{t-1} - 0.11 * \Delta pimport_{t-2} + 0.03 * \Delta deppub_{t-1} \\
+ 0.01 * \Delta deppub_{t-2} + 0.24 * \Delta outputgap_{t-4} + \epsilon_t
\]

\[\begin{array}{c}
\text{(2)} \\
[-0.19] \\
[-1.60] \\
[2.36] \\
[1.04] \\
[1.62] \\
[0.81] \\
[2.85] \\
[1.86] \\
[0.64] \\
[-2.87] \\
[2.39] \\
[0.51] \\
[2.25]
\end{array}\]

There is a negative and statistically significant error correction term \((EC_{t-1})\), which confirms the existence of a co-integration relationship between domestic prices and their determinants. When inflation is 1 percent below its equilibrium level in a given quarter, it would increase by about 0.03 percent in the following quarter, suggesting that the speed of adjustment is fairly low. This is

---

\(^4\) The errors are uncorrelated and homoscedastic.

\(^5\) Note that the sign of the coefficient associated with government spending can either be negative or positive. If public spending yields productivity gains of capital and/or labor, then a larger public spending would be associated with lower inflation and would contribute to price stability in the long run. In contrast, if productivity gains do not materialize, then larger fiscal deficits driven by higher levels of public spending would lead to situations of excess demand, which in turn could fuel inflation expectations and rise inflation in the long run.

\(^6\) Price homogeneity (of degree one) in the money demand function implies that changes in the stock of money in the long run would translate into proportional changes in the price level. This condition is crucial for long-run monetary neutrality.
consistent with the high persistence of inflation in the short run, which confirms that inflation tends to move slowly towards its long-run value following a shock.

19. While inflation seems to be driven in part by changes in money supply, structural factors on the supply side could also be important determinants of inflation in the short run. The variables of macroeconomic policy do not seem to be important determinants of inflation in the short run, except for money supply. A 1 percent increase in the money supply would result in a price increase of about 0.2 percent, while a similar shock to public spending would increase inflation only marginally by 0.03 percent. As well, exchange rate fluctuations are estimated to have a very limited impact on price levels over the short run (less than 0.1 percent). Changes in import prices seem to also have a marginal impact on domestic prices in the short run. Finally, a positive nonhydrocarbon output gap contributes to prices increases with a certain lag. A positive output gap of 1 percent is associated with an increase of 0.2 percent in the level of prices. The fact that macroeconomic policy variables appear to play only a limited role in the development of inflation over the short run seems to indicate that other factors, not captured in this equation, are in play. These would be primarily of a structural nature linked to supply, such as imperfections in the market for goods and services and real wage rigidities that hold wages above market clearing levels.

20. However, variance error decomposition of domestic prices indicates that the contribution of macroeconomic policy shocks to the variability of inflation increases over time. Variance error decomposition indicates the proportion of the forecast error in a given variable that is accounted for by innovations (i.e., shocks) in each endogenous variable. The results of variance decomposition suggest that the direct effect of domestic price variable on itself is high in the beginning and declines slowly as the forecast horizon expands, reaching 47 percent after eight quarters. This confirms the large inertia in inflation, pointing to some nominal rigidities and the challenges it could pose for anchoring inflation expectations. Innovations in M2 and nominal exchange rate increasingly explain the variance of domestic prices over time, reaching about 40 percent after eight quarters. Consistent with the results of the VECM analysis, a marginal proportion of the variance of domestic prices is explained by the price of imported goods, which remains lower than 1 percent after eight quarters.

21. An error-correction model (ECM) estimation confirms the results described above. Estimating a single-equation model allows for a more parsimonious specification than the heavily parameterized VECM. Because of the relatively small number of available observations, and in order to check the robustness of the VECM results, we estimated a ECM. This approach is widely used to help interpret the interactions between variable on the short- and long-run (Juselius, 1992; Diouf, 2007). It consists in first estimating two cointegration relationships: (1) a first relationship, based on monetary theory, which reflects the correlation between prices and the money supply, and; (2) a
second relationship, based on the PPP, which expresses price levels as a linear combination of the exchange rate and the price of imported goods. The deviations from the long-run equilibrium (i.e., the error correction terms) are then integrated into a short-run model to specify a single-equation inflation model. The results of the ECM estimation are reported in Appendix 1.

F. Policy Implications

22. This analysis highlights several points related to the making of policies that would contribute to price stability in Algeria:

- **Fluctuations in the exchange rate do not appear to have a significant impact on inflation in the short term.** Separate from its implications for competitiveness (given the significant overvaluation of the dinar in real terms), a policy of anchoring the dinar to the currencies of Algeria’s main trading partners may not be helpful to guide and stabilize the expectations of economic agents in the short term.

- **Monetary policy should provide a solid anchor for medium and long-term inflation expectations.** Fluctuations in the exchange rate seem to be reflected fully in long-term inflation. Given that money is also a determining factor of long-term inflation, the central bank needs to quickly reestablish its control over domestic liquidity conditions and interest rates to strengthen monetary policy’s transmission channels and help anchor inflation expectations around the inflation target.

- **Fiscal consolidation must be conducted in a strategic manner to contribute to stable inflation over the medium and long run.** In the short term, a drop in fiscal spending reduces inflationary pressures. However, in the long term, fiscal spending appears to contribute to price stability via gains in the productivity of capital (e.g., through improved infrastructure) and of labor (e.g., by improving access to health and education). If these long-term gains are to be assured, fiscal consolidation should be approached in a way that improves the effectiveness of public investment and preserves funding for education, health, and research and development.

- **The pace of structural reforms should be stepped up to reduce nominal (wage) rigidities and create an environment of healthy competition.** Structural factors on the supply side seem to be important determinants of inflation in Algeria. In particular, it is important to reduce nominal rigidities by implementing reforms that support labor market flexibility. It is also important to improve the functioning of the markets for goods and services and to strengthen competition.
References


Appendix I. The Results of the ECM

We estimate an ECM to assess the robustness of the VECM results. Because we have only a small number of observations, we estimate an ECM that allows for a more parsimonious specification than the heavily parameterized VECM. First, we investigate each of the two equilibrium relationships resulting from the monetary and PPP theories. Then, we examine the relative importance of deviations from these relationships and other potential determinants of inflation in the short run. As explained above, the implications of the mark-up theory are not analyzed due to the unavailability of long time series for the cost of the factors of production.

We estimate a money demand model that establishes a relationship between broad money, public spending and opportunity costs of holding money. The demand money model is used to determine the equilibrium in money market. The determinants of money demand have been well investigated in the empirical literature. Typically, money demand can be written as a function of a scale variable, proxied by income, and a vector of rate of returns that measure the opportunity costs of holding money. Available data cover a period of excess liquidity during which interest rates were relatively low and flat. Hence, we use the nominal effective exchange rate as a measure of the opportunity cost of money. We also use real public spending as a scale variable given that public spending is the main driver of growth in Algeria over the sample period.

The results of the broad money regression are broadly consistent with the VECM analysis. Based on the Johansen and Juselius (1990) test, there is at least one long-run relationship between domestic prices ($p$), the nominal effective exchange rate ($e$), broad money excluding Sonatrach’s deposits ($m2$) and real public spending ($deppub$). The results shown in Equation (3) suggest a positive and statically significant long-run relationship between domestic prices and broad money. An increase of 1 percent in broad money would increase the price level by 0.3 percent, a similar magnitude to that found with the VECM. We also find a negative relationship between public spending and domestic prices in the long run, but the impact on domestic prices of higher fiscal spending would be lower (0.1) than that estimated with the VECM1

\[
p = 0.30 * m2 + 0.53 * e - 0.11 * deppub
\]

\[
[7.04] [8.44] [-2.14]
\]

(3)

We also estimate PPP that relates domestic prices to external factors. We find a unique cointegration relationship between domestic prices ($p$), nominal effective exchange rate ($e$) and import prices ($pimport$).

\[
p = 0.46 * pimport + 1.41 * e
\]

\[
[5.97] [9.59]
\]

(4)

1The sign of the coefficient associated with NEER implies a negative relationship between money demand and NEER. This suggest that economic agents tend to replace broad money holdings by foreign assets (i.e., US$ the value of which are not affected by exchange rate depreciation.)
As shown in Equation 4, the sign and size of the coefficients are similar to those obtained with the VECM. Exchange rate shifts would be fully reflected in domestic prices, while an increase of 1 percent in import prices would translate into an increase of 0.6 percent in domestic prices in the long run.

We estimate an ECM that incorporates the deviations from the above-mentioned long-run relationships and other potential short-run inflation drivers. A parsimonious model is derived using a general-to-specific model selection procedure. Various tests were performed to analyze the properties of the model, including for the absence of autocorrelation and heteroscedasticity, and regression misspecifications. Furthermore, the robustness of the model was analyzed using tests for omitted variables and coefficient stability. The inflation equation is the following:

\[
\Delta p_t = -0.5 - 0.03 * ECM_{t-1} - 0.05 * ECE_{t-1} + 0.29 * \Delta p_{t-1} + 0.29 * \Delta \pi_{t-1} + 0.07 * \Delta e_{t-1}
\]

\[
+ 0.07 * \Delta m_{2t-1} + 0.04 * \Delta \text{import}_{t-1} + 0.04 * \Delta \text{deppub}_{t-1} + 0.10 * \Delta \text{outputgap}_{t-4}
\]

This analysis confirms that inflation is persistent and that macroeconomic policy variables are not the key drivers of inflation in the short run. Consistent with the results of the VECM, the speed of adjustment towards the long-run value of inflation is low. For example, when inflation is 1 percent below its PPP equilibrium level, it would increase by only 0.05 percent in the following quarter. Also, money supply and exchange rate fluctuations do not appear to contribute significantly to inflation in the short run. A 1 percent increase in the money supply or fiscal spending would result in a price increase of less than 0.1 percent. External factors have also very small impact on inflation in the short run. A 1 percent depreciation of the exchange rate or increase in import prices would be associated with an increase of less than 0.04 percent in inflation. Finally, a positive nonhydrocarbon output gap contributes to prices increases with a certain lag. A positive output gap of 1 percent is associated with an increase of 0.1 percent in the level of prices.