INTERNATIONAL MONETARY FUND

ALGERIA

SELECTED ISSUES

May 2016

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**International Monetary Fund
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CONTENTS

A STRUCTURAL MODEL FOR ALGERIA[1]

A. Introduction

1.   The sudden and sharp decline in oil prices presents important challenges for macroeconomic performance and financial stability in Algeria. Algeria's economy is highly dependent on hydrocarbons for growth, budget revenues, and exports. The nonhydrocarbon sector, consisting largely of industry and services, is driven by public spending financed by hydrocarbons revenues, and therefore its performance is also highly correlated with oil prices. The collapse in oil prices has exacerbated an already unsustainable fiscal position and swung once-comfortable current account surpluses into deep deficit.

2.   The oil price shock also poses challenges for macroeconomic policy formulation. Given the size and likely duration of the oil price shock, maintaining current high levels of fiscal spending would cause a considerable widening of the budget and current account deficits and a rapid depletion of fiscal savings and international reserves. The adjustment to the shock will require a reduction in domestic absorption that, for the time being, can mainly be achieved by tightening the fiscal stance. However, this will reduce growth given the high dependency of the economy on fiscal spending, although Algeria could shape fiscal adjustment in a gradual manner thanks to its sizeable fiscal and external buffers. To reduce the impact on growth, the fiscal adjustment should be supported by a well-designed monetary policy, which will soon be able to rely on short-term interest rates as a policy instrument once excess liquidity gives way to structural shortages, as well as an appropriate exchange rate policy.

3.   This paper develops a structural macroeconomic model for Algeria that can help inform the discussion of the policy choices faced by the authorities. The model captures the core dynamics of Algeria's macro-economy and provides an organizing framework for forecasting and policy analysis that can facilitate an assessment of the optimal policy responses to oil shocks and the implications for macroeconomic stability. A key question is what is the right mix of fiscal consolidation, exchange rate depreciation, and monetary policy adjustment that would deliver fiscal sustainability, minimize the cost of adjustment on growth, and keep inflation in check.

4.   Results from the model suggest that authorities face a trade-off between, on the one hand, a somewhat larger output contraction and, on the other, a lower debt burden and greater price stability. Exchange rate depreciation cannot substitute for real adjustment, whose magnitude depends on the size of world oil price decline and, as such, will be significant. Maintaining a fixed exchange rate would shift the burden of adjustment entirely to fiscal policy, leading to a larger aggregate demand decline and public debt accumulation. By contrast, allowing the dinar to freely float would increase inflation and trigger a procyclical monetary policy response

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[1] Prepared by Moez Souissi. The model was built in collaboration with Jan Vlcek (Czech National Bank).
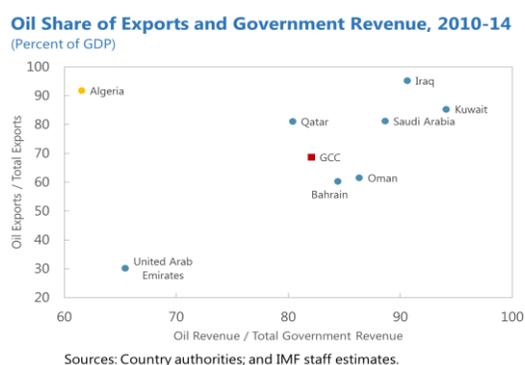
that would reinforce the impact of fiscal tightening on demand. A well-calibrated exchange rate policy could align the objectives of monetary and fiscal policies, resulting in lower GDP losses and price volatility while supporting fiscal sustainability.

5.   The remainder of the paper is structured as follows. Section 2 provides an overview of Algeria's economic structure, recent macroeconomic developments, and the policy framework. Section 3 presents the model. Section 4 discusses alternatives for monetary policy to support fiscal policy in the face of a persistent oil price shock, and assesses the potential costs of the different options. Section 5 concludes.

B.   Stylized Facts and Recent Developments
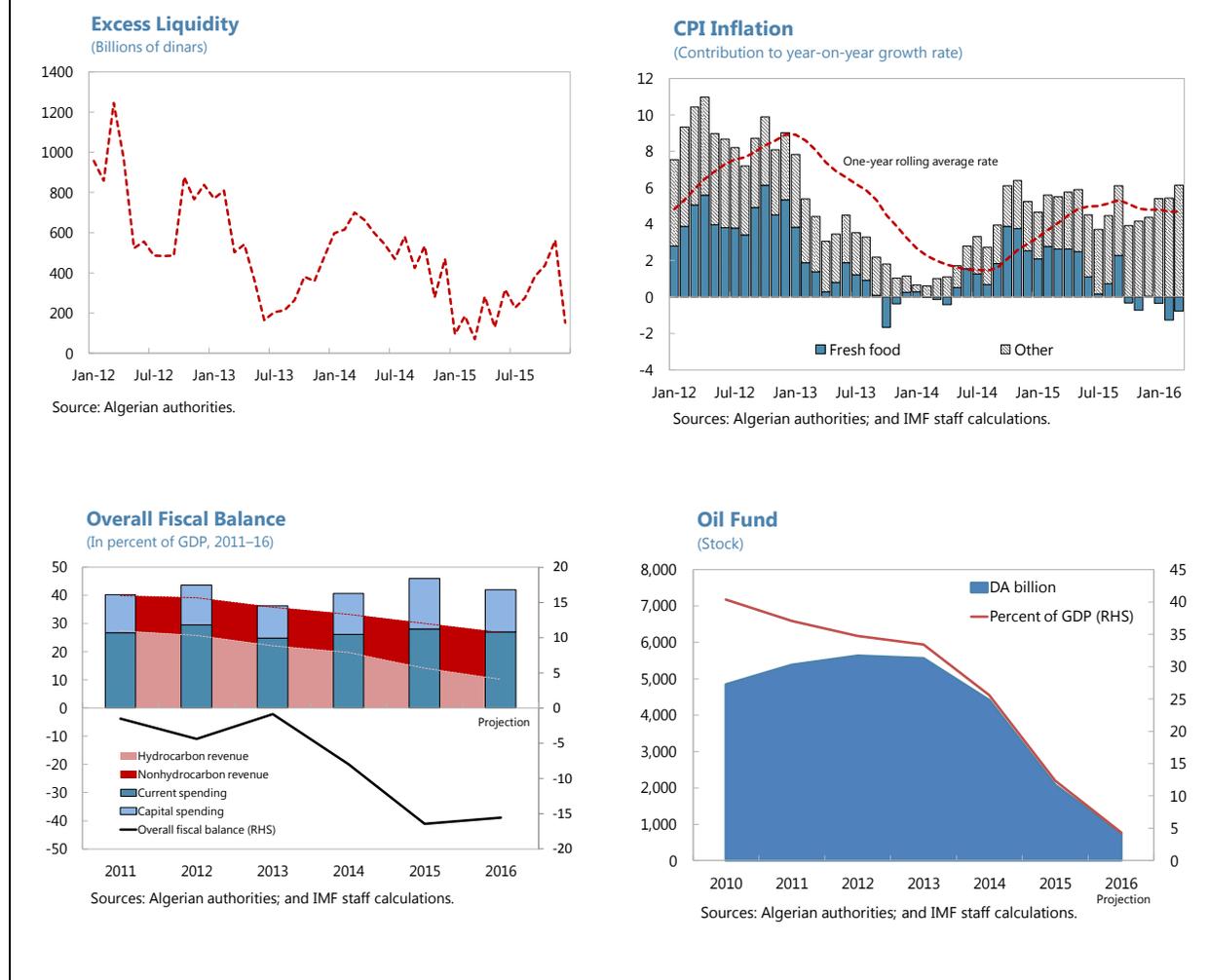
Recent economic developments

6.   The Algerian economy depends heavily on hydrocarbons. In 2015, hydrocarbons accounted for about 25 percent of GDP, 94 percent of export earnings, and 48 percent of budget revenues. The nonhydrocarbon sector consists mainly of industry and services fueled by oil-related government spending. It accounts for about 75 percent of the economy.

Oil Share of Exports and Government Revenue, 2010-14
(Percent of GDP)

Sources: Country authorities; and IMF staff estimates.

7.   The oil price boom over the last several years enabled Algeria to build up substantial external and fiscal buffers. Rapidly rising oil prices led to strong growth of hydrocarbon exports, which in turn generated large current account surpluses and a surge in hydrocarbon revenues. International reserves rose to a peak of US$194 billion in 2013, equal to nearly three years of imports. Part of the hydrocarbon revenue windfall was used to pay down external debt; part was saved in the country's oil savings fund, which reached 43 percent of GDP in 2009.

8.   However, the sharp decline in hydrocarbon prices since 2014 is unmasking longstanding vulnerabilities. The fiscal position—already weakened by a ramp-up in spending in the wake of the Arab Spring—deteriorated significantly in 2015 as oil revenues plummeted. The fiscal deficit doubled to 16.4 percent of GDP. Hydrocarbon exports fell by nearly half, causing the current account deficit to widen sharply. Fiscal savings fell to 12.3 percent of GDP and could reach their statutory floor in 2016. Reserves, while still substantial (2½ years of imports), declined by US$35 billion. Public spending continued to increase, fueling imports and a loss of competitiveness, and placing fiscal policy on an increasingly unsustainable path (Figure 1).
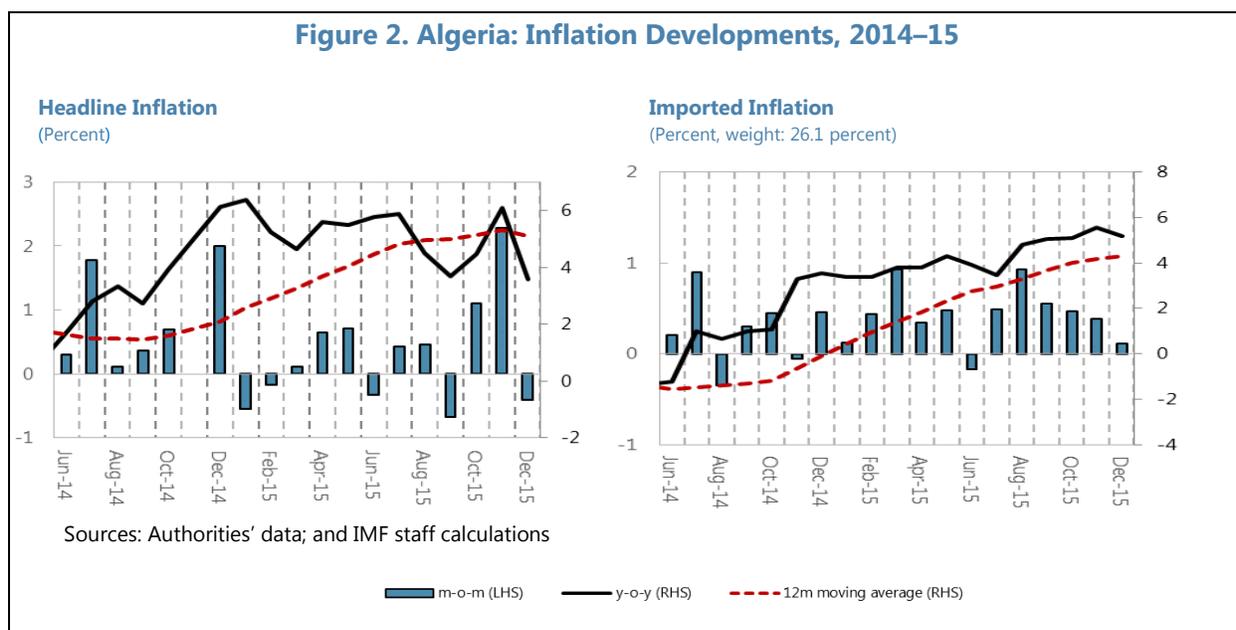
Figure 1. Algeria: Macroeconomic Developments, 2010–16

Excess Liquidity
(Billions of dinars)

Source: Algerian authorities.

CPI Inflation
(Contribution to year-on-year growth rate)

One-year rolling average rate

■ Fresh food   ▨ Other

Sources: Algerian authorities; and IMF staff calculations.

Overall Fiscal Balance
(In percent of GDP, 2011–16)

Projection

■ Hydrocarbon revenue
■ Nonhydrocarbon revenue
■ Current spending
■ Capital spending
— Overall fiscal balance (RHS)

Sources: Algerian authorities; and IMF staff calculations.

Oil Fund
(Stock)

■ DA billion
— Percent of GDP (RHS)

Sources: Algerian authorities; and IMF staff calculations.

9.   The policy response to the oil price shock initially focused on allowing nominal exchange rate depreciation. To moderate import demand and reduce pressure on reserves, the Bank of Algeria (BA) allowed the currency to depreciate by 25 percent against the US dollar and by 6.7 percent against the euro in 2015. The 2016 budget, however, calls for a sharp reduction in spending, and the authorities have initiated some reforms including higher taxes on energy products. To finance the increasing current account deficit, Algeria has been drawing down its foreign exchange reserves. The authorities have been reluctant to issue new external debt despite a low current level of public debt.

10.   High dependence on imports is expected to result in some pass through of exchange rate depreciation to inflation. Inflation rose to double-digit levels (on a year-on-year basis) in 2012 following public sector wage increases. While it retreated in 2014 to average 2.9 percent, average year-on-year inflation exceeded the 4 percent target of the BA in 2015. It was partly driven by higher import price inflation, suggesting some degree of exchange rate pass-through as the dinar depreciated significantly against major currencies in 2015 (Figure 2). In the absence of accurate

estimate of the exchange pass-through for Algeria, we assume in the rest of the paper that the pass-through is less than one.

Figure 2. Algeria: Inflation Developments, 2014–15

Headline Inflation
(Percent)

Imported Inflation
(Percent, weight: 26.1 percent)

Sources: Authorities' data; and IMF staff calculations

m-o-m (LHS)　　y-o-y (RHS)　　12m moving average (RHS)

Monetary policy framework

11.　The ultimate objective of the BA's monetary policy is to achieve price stability. The BA has since 2010 explicitly targeted price stability, in addition to external stability of the currency. There is an explicit annual inflation target of 4 percent. The monetary policy framework has adjusted over time to reflect the developments of the economic environment caused by oil price fluctuations. Since 2003, base money has been the main intermediate instrument of monetary policy, and liquidity management tools have dominated the monetary policy toolkit. Exchange rate policy targets the equilibrium value of the real effective exchange rate, but has occasionally been used to contain price pressures, a policy that is easily implemented due to the price-maker status of the BA on the forex market.

12.　The monetary framework relies on transmission channels of uneven effectiveness. A recent IMF study on the effectiveness of monetary policy in Algeria finds that expectations might have played a powerful role in the price-setting mechanism during periods of high inflation.[2] The interest rate channel is currently muted and unresponsive to changes in monetary conditions, due to excess liquidity and the insufficient development of the financial system, blurring the signaling of the policy stance. However, prior to 2004, the policy rate was found to significantly affect bank lending and saving rates. Going forward, excess liquidity conditions are expected to switch to

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[2] See 2014 Selected Issues Paper: "Enhancing the Effectiveness of Monetary Policy in Algeria."

structural refinancing needs, offering the BA an opportunity to re-establish control over domestic liquidity conditions and short-term interest rates.

13.   Inflation dynamics in Algeria are sensitive to administrative controls and exchange rate changes. Food items, a third of which are subject to price controls, account for over 43 percent of the CPI basket. Prices of non-administered food items tend to be volatile either because of domestic (e.g., weather) or external factors (e.g., international prices). Altogether, consumption goods and services with administered prices account for 26 percent of the CPI basket. Goods and services with high import content also represent a large share of the CPI basket (26 percent).

Fiscal policy framework

14.   Algeria's de jure fiscal framework is based on a saving rule based on the current oil price. Algeria created an oil stabilization fund (Fonds de Regulation des Recettes, or FRR) in 2000 to insulate the Algerian economy from volatility in hydrocarbon prices. There is a saving rule that stipulates that oil revenue is saved into the FRR above the oil price threshold of US$37 per barrel.

15.   However, in practice, Algeria's fiscal stance has been heavily influenced by hydrocarbon prices. Public spending is disconnected from the saving rule since the FRR can be freely drawn upon for budget support. The nonhydrocarbon primary deficit (NHPD) and spending have been highly correlated with oil prices for the past 15 years, widening during good times and contracting in bad times.

16.   Subsidies not only carry large fiscal cost but also weigh on external sustainability. Subsidies cost an estimated 13.6 percent of GDP in 2015, with energy subsidies accounting for over half this amount. In addition to their fiscal cost, subsidies have increased domestic energy consumption, squeezing exports and encouraging large-scale smuggling to neighboring-countries.

C.   The Model

17.   The analysis is based on a structural model. The key equations of the model derive from micro-foundations.[3] The model's equations jointly determine the dynamics of inflation, output, short-term interest rates and the real exchange rate.[4] The system of equations is subject to various shocks, the variance of which can help derive measures of uncertainty in the baseline forecast.

18.   The model exhibits correct accounting of both stock and flow variables. Namely, it determines the country's net exports and net foreign assets along with government debt and deficits. Without a stock-flow consistency, the model would not be able to determine the effects of

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[3] A detailed description of micro-foundations of the model and its derivation is provided in Appendix I.

[4] Key equations of the model are based on explicit assumptions about the behavior of the main economic actors in the economy (households, firms, and the government). These agents interact in market that clear every period, which leads to the general equilibrium feature of the model.

the terms-of-trade shocks on variables of interest such as debt. This feature contrasts the model to Berg et al. (2006), commonly used as a workhorse model working only with flows.

19.   The model employs a new-Keynesian methodology with rational expectations, taking into account the stylized facts of Algeria's economy. The model consists of four building blocks:

- A real block defines both domestic demand (i.e., private and public absorption minus imports) and oil exports. It also includes a fiscal rule that influences the level and composition of public expenditures. The hydrocarbon sector plays a key role in shaping budget revenues and GDP.

- A second block links the real economy with price dynamics, which is represented by a Phillips curve.

- A third block comprises a financial link with the rest of the world through arbitrage conditions, whereby the country risk premium is assumed to react to changes in the net foreign asset position of the country.

- The last block consists of monetary policy with a price stability objective. The model is closed by a "hybrid" policy reaction of the central bank. The policy rule, which is defined typically for countries with a closed capital account, assumes that the central bank can use exchange and interest rates as policy instruments to influence monetary conditions.

20.   The rest of the model consists of definitions and accounting identities. Expectations play a crucial role in the model as future dynamics of macroeconomic variables matter for their current levels. Expectations are rational, i.e., the model, assumes that economic agents know the dynamics of the economy and the behavior of key macroeconomic variables (model consistent expectations). The structural characteristics of the model and the nature of expectations make the model immune to the Lucas criticism.

21.   The standard notation in the literature is adopted. For any given variable X, we denote a natural logarithm of this variable by a small letter x. The model is specified for quarterly frequencies, a delta (Δ) in front of the variable indicates quarter over quarter annualized seasonally adjusted changes, except for in inflation rates which are denoted by π, an asterisk ($*$) denotes a foreign variable, and finally (ss) denotes steady state variables.

Real block

22.   The real block determines the dynamics of domestic private and public absorptions, and foreign trade.[5] The economy consists of households who own all firms in the nonhydrocarbon sector. The government owns the hydrocarbon sector and collects its export revenues as well as

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[5] To keep the model tractable, we do not model investment. It would require introducing an additional state variable for capital, and its accumulation. Hence, we simply aggregate investment together with private consumption.

other tax revenues, purchases goods and services, and makes transfers to households. The external sector is affected by fluctuations in oil prices and changes in consumption behavior of households and the government.

Households

23. **Households are forward-looking (i.e., Ricardian).** They smooth their consumption intertemporally and maximize their utility, subject to the following budget constraint:

$$P_t^A A_t + B_t + S_t B_t^* = \text{W}_t \text{N}_t \ + \exp\left(\frac{i_{t-1}}{400}\right) B_{t-1} + exp\left(\frac{i_{t-1}}{400}\right) B_{t-1}^* + T_t + \ \Pi_t \tag{1}$$

Following equation (1), households' revenues consist of wage income (WN)—where W is the nominal wage and N are labor hours—government transfers net of taxes (T), and profits (Π). Households use their income to finance final good consumption ($P^C A$), where P^A represents the deflator and A the domestic absorption, and invest in government bonds B (domestic) and B^* (foreign).

24. **Equation (2) describes the dynamics of private absorption (A).** It represents the first-order optimality condition for maximizing their utility function with respect to (1), so-called Euler equation.[6] Equation (2) implies that the marginal rate of substitution between consumption today and future consumption equals the real interest rate.[7] To smooth absorption dynamics, we introduce a lag term reflecting habit preferences (i.e., households prefer to preserve past level of their consumption) that permits shocks to have persistent effects.[8]

$$\left(A_t \ - \beta_1 A_{t-1}\right)^{-\sigma} = \left(A_{t+1} - \beta_1 A_t \ \right)^{-\sigma} \frac{1}{R_t} \exp(\varepsilon_t^A) \tag{2}$$

25. **At the core of the private absorption dynamics is the negative relationship between the real interest rate and desired spending.** When real interest rates are expected to be high, households would rather save than consume. At the same time, they are willing to spend more when future prospects are promising, regardless of the level of interest rates.

Government

26. **The fiscal bloc determines the role of the fiscal policy in the economy.** We assume that the government owns the hydrocarbon sector and all of its related export revenues ($P^X X$). Accordingly, any increase in world oil prices raise oil sector revenues and results in higher transfers

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[6] Equation (2) describes the dynamics of private absorption and not its level, which is determined by the country's revenues, particularly from the hydrocarbon sector.

[7] σ is a constant intertemporal elasticity of substitution (IES) of consumption.

[8] We calibrate β_1 to 0.8 which is at the edge of the range of parameter values used in the literature (i.e., between 0.5 and 0.8). This value indicates the high degree of private consumption persistence, consistent with the data for Algeria.

to households, which in turn lift up their budget constraint and lead to a higher consumption. Budget revenues are as follows:

$$BR_t = P_t^X X_t \tag{5}$$

Budget revenues are distributed through government spending of final goods ($P_t^C G_t$), and transfers (T_t) to households.[9]

$$BE_t = P_t^C G_t + T_t \tag{6}$$

Primary budget deficit (BD) is the difference between budget expenditures and budget revenues. Any deficit is financed by domestic government bonds issued at interest rate i, increasing government debt (D_t).

$$D_t = D_{t-1} + BD_t + i_{t-1}D_{t-1} \tag{7}$$

27.   The government can change the level and composition of its expenditures based on a fiscal rule.[10] We assume that the government modifies the amount of its consumption of goods and services to keep the debt close to a sustainable level (B^{ss}) as follows:

$$P_t^C G_t = (P_{t-1}G_{t-1})^{\alpha_1}(P^{ss}G_{ss})^{1-\alpha_1}(D_t - D^{ss})^\theta + \varepsilon_t^g \tag{8}$$

28.   The rule has two main functions. The first is to respond to the business cycle. The rule allows the fiscal authority to adjust expenditures, and hence the overall fiscal balance, to changes in revenues induced by fluctuations in hydrocarbon prices. The second main function of the rule is to stabilize the government debt-to-GDP ratio to its long-run target that ensures intergenerational equity. This target pins down the long-run net asset position of the general government, and ensures dynamic stability.

29.   The parameter θ determines the responsiveness of the fiscal rule to changes in the hydrocarbon revenues. A calibration of θ greater than zero implies that fiscal spending is maintained as long as the government's debt is lower than its sustainable level and it is reduced when the government's debt exceeds its sustainable level. In the latter case, the higher the level of θ, the larger and the faster would be the adjustment.

30.   Besides ensuring debt sustainability, the government also smooths real economic activity (private absorption) through transfers. Transfers are kept close to a target level, defined in terms of share on private absorption. However, the government smooths transfers adjusting them only gradually to mitigate effects of income shocks on private consumption.[11]

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[9] The share of government transfers accruing to each household type is determined by its share of total labor hours, and is kept constant.

[10] In the absence of any explicit fiscal rule for Algeria, fiscal policy becomes neutral, in that it fully accommodates the oil price shock by adjusting expenditures accordingly.

[11] As such, transfers in the model can be interpreted as subsidies net of taxes.

$$T_t = (T_{t-1})^{\alpha_2}(T^{ss})^{1-\alpha_2}\left(\frac{P_t^A A_t}{P_{t-1}^A A_{t-1}}\right)^{-\alpha_3} + \varepsilon_t^T \tag{9}$$

External Sector

31.   The trade block consists of two equations that specify the determinants of export (X) and import (M) volumes. The specification of these equations takes account of the structure of Algeria's foreign trade, in which hydrocarbons account for the bulk of exports, and imports account for a large and stable share of domestic spending. Given the preponderance of hydrocarbons in Algeria's exports, real exports are inelastic relative to standard determinants such as real effective exchange rate or foreign real income. We model the growth of real hydrocarbon exports rather than levels (Equation 3). It is hard to assess the long-term level of hydrocarbon production in Algeria because the amount of extracted hydrocarbons depends on investments in the sector, available technologies of extraction and the maturity of fields. We model real export growth by an autoregressive process that reflects the persistent effects of shocks to hydrocarbon production and domestic consumption, while allowing for changes in the long term growth rate of hydrocarbons $(\overline{\Delta X})$.[12] The volume of exports is multiplied by the world price of oil and provides the main bulk of country revenues.

$$\Delta X_t = \rho \Delta X_{t-1} + (1 - \rho)\overline{\Delta X} + \varepsilon_t^X \tag{10}$$

Import volumes are defined in Equation (4). As explained above, to match the data, we model real imports as a stable share of domestic production. This assumes that both private and public final good producers use imported goods and services in combination with domestic intermediate production to get final consumption goods and services.[13]

$$M_t = \omega^M Y_t \exp(\varepsilon_t^M) \tag{11}$$

where M_t are real imports, ω^M is the share of real imports in final good production (Y_t). Multiplying import volumes by import prices yields nominal imports. Import prices (P_t^M) are defined as US CPI adjusted by the nominal exchange rate of dinar to the U.S. dollar. In order to capture observed data, there is import price Phillips curve that ensures smooth and gradual change of import prices in response to foreign prices and exchange rate shifts.

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[12] Equation (3) implies that that any shock to oil production, ε_t^X, will increase or decrease oil exports persistently without returning to the original level, as would be the case of a level equation. The long-term growth rate of hydrocarbon exports is determined by new investments in the sector and fiscal measures that can reduce domestic consumption, such as subsidy reforms.

[13] For domestic final good production, we assume a Leontief production function that combines both imported and domestic intermediate goods and services. As a result, the shares of domestic and imported goods in total production are invariant, and therefore the demand for these two types of goods does not depend on their relative prices. For the production of domestic intermediate goods, we assume a Cobb-Douglas production function with labor being the only production factor. The final good production is the sum of private and public consumption.

The external balance is determined using net exports and net foreign asset position, as described in Equation (8). Net exports represent the difference between hydrocarbon exports and imports. The net foreign asset position reflects the accumulation of all past net export deficits, meaning foreign debt and borrowing, adjusted by the foreign interest rate.

$$B_t = (1 + i_t^{US})B_{t-1} + P_t^X X_t - P_t^M M_t \tag{12}$$

Finally, we sum up the different components of GDP to get the aggregate nominal and real GDP as follows:

$$Y_t^N = P_t^A A_t + P_t^A G_t + P_t^X X_t - P_t^M M_t \tag{13}$$

$$Y_t = A_t + G_t + X_t - M_t \tag{14}$$

where P_t^A, P_t^X, and P_t^M are the deflators of absorption, exports and imports respectively

Philips curve

32.   Inflation dynamics are represented by a reduced-form (Phillips curve) with import prices capturing the impact of external influences. Headline inflation (π) depends on expected and lagged inflation and the current value of real marginal cost inflation. Real marginal costs are given by the production structure of final consumption goods in the model. Specifically, the Phillips curve is of the form:

$$\pi_t = \lambda_1 E(\pi_{t+1}) + (1 - \lambda_1)\pi_{t-1} + \lambda_2 rmc_t + \varepsilon_t^\pi \tag{15}$$

$$rmc_t = [\omega w_t + (1 - \omega)(cpi_t^{US} + s_t)] - cpi_t \tag{16}$$

where ω represents the share of domestically produced goods in the CPI basket, w_t is the nominal domestic wage, and s_t is the nominal exchange rate of the dinar against the US dollar.[14]

33.   The specification of the Phillips curve is derived under the assumption of staggered price setting.[15]We employ a Calvo price setting with full backward indexation. Forward-looking expectations are fully model-consistent (i.e., rational expectations). Parameters in the Phillips curve are set in line with micro foundations and the data. The data for Algeria shows a high degree of inflation inertia, indicating that economic agents typically view past inflation as a good predictor of future inflation dynamics. Therefore only large changes in real marginal costs would impact current inflation.

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[14] Equation (9) can be written as follows: $rmc_t = \omega w_t^r + (1 - \omega)z_t$, where w_t^r is the real wage and z_t is the real exchange rate.

[15] This specification can be derived from micro-foundations. The real marginal costs represent the natural logarithm of marginal cost in deviation from the price index that maximizes the profit of the representative firm in that sector. We assume that the production of final consumption goods requires both domestic and imported inputs.

Monetary and exchange rate policy

34.   The model captures the usage of the exchange rate as a monetary policy instrument and also allows for assessing different policy options. The choices of exchange rate and monetary policy regime are not independent. If capital is free to flow, a country that pegs its exchange rate cannot afford an independent monetary policy and vice versa. However, in our model, the central bank can use both short-term interest rates and the exchange rate as policy instruments, as Algeria's capital account is closed.

35.   The exchange rate and interest rates are linked using a modified version of the uncovered interest-rate parity condition. We capture the relationship with the rest of the world using an alternative version of the uncovered interest rate parity condition (Equation 10). This condition states that, in the case of perfect international capital mobility, the yield of investment into domestic economy has to be equal to foreign (U.S. dollar) yield adjusted by the country risk premium and the expected change in exchange rate valuation.

$$s_t = s_{t+1}^e + (-i_t + i_t^* + prem_t)/4 + \varepsilon_t^{UIP} \tag{17}$$

where s_t is the natural logarithm of the nominal exchange rate, s_{t+1}^e is the expected exchange rate, i_t is domestic money market rate, i_t^* is the foreign interest rate, and $prem_t$ is a country risk premium.

To capture a managed exchange rate regime, we modify the above equation as follows:

$$s_t = e_1 s_t^T + (1 - e_1)\left(s_{t+1}^e + \frac{-i_t + i_t^* + prem_t}{4}\right) + \varepsilon_t^{UIP} \tag{18}$$

$$s_t^T = e_2 s_{t-1}^T + (1 - e_2)(s_{t-1}^T + e_3 \Delta poil_t) \tag{19}$$

By setting the parameter e_1, we can capture different exchange rate arrangements. While $e_1 = 1$ corresponds to a pegged (or fully managed) exchange rate regime, $e_1 = 0$ matches a fully floating exchange rate regime. Equation (19) determines the level of exchange rate target that is set by the central bank (s_t^T). Among others, the nominal exchange rate depends on shocks to oil prices suggesting that the central bank can allow for some exchange depreciation (which is captured by the parameter e_2) in response to negative terms of trade shocks.[16]

Furthermore, in order to smooth exchange rate dynamics under the floating regime, we define exchange rate expectations as follows:

$$S_{t+1}^e = \mu_1 S_{t+1} + (1 - \mu_1)\big((S_{t-1} + 2(\bar{Z}_t + \pi_t - \pi_t^*)\big) \tag{20}$$

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[16] Setting e_2 equal to 0, we capture the case of fully pegged exchange rate to a particular target level s_{t-1}^T. Calibrating parameter e_2 different from zero, we assume that the central bank adjusts the level of the exchange rate target in line with the world oil price developments. Such a policy resembles the case of real exchange rate smoothing to avoid external imbalances.

The rational-expectation term is represented by S_{t+1} and is given a weight μ_1. When $\mu_1 = 1$, expectations are purely rational and the model will have Dornbush (1976) overshooting dynamics.

36.   The specification reflects BAs monetary policy objective of price stability and reliance on exchange rate rather than interest rates. Therefore, we use the following form of monetary policy rule in the model:

$$i_t = \delta_1 \left(S_{t+1} - s_t + \frac{i_t^*}{4} + \frac{prem_t}{4} \right) + (1 - \delta_1)(\delta_2 i_{t-1} + (1 - \delta_2)(i_t^{neutral} + e_3 \pi_{t+1}^{DEV}) + \varepsilon_t^i \qquad (21)$$

Where π_{t+1}^{DEV} represents the expected deviation of inflation from the target level. Setting $\delta_1 = 1$ implies that monetary policy targets the exchange rate, and therefore is not independent in terms of setting an inflation target and steering domestic interest rates under capital mobility. In this case, domestic money market interest rate is implied by the UIP and the exchange rate target. In the contrary if $\delta_1 = 0$, we have an independent monetary policy that sets money market rates based on a forward-looking rule of Taylor type. In this case, the key monetary policy instrument is based on some short-term nominal interest rate that the central bank sets it in order to achieve a target level for inflation (π^*).

Calibration

37.   The model is calibrated to reflect properties of the Algerian economy (Table 1). The production function is intensive in labor and non-energy imports. The export industry is the most important income-generating sector. To capture the high degree of private consumption persistence (Equation 2) and the high inflation inertia (Equation 15) observed in the data, we set β_1 to 0.8, which is at the edge of the range of parameter values used in the literature (i.e., between 0.5 and 0.8), and λ_2 to 0.1. To reflect the low flexibility of fiscal expenditures, we set α_1 and θ (Equation 8) to 0.5 and 0.25, respectively.[17]Calibrating the Taylor rule parameters (Equation 21) is challenging, since the interest rate transmission mechanism of monetary policy in Algeria was muted during the oil price upturn. For the sake of illustrating the propagation mechanisms of the shock and policy tradeoffs, we assume that e_3 equals 1.2, reflecting that price stability is the primary objective of the central bank. Parameters δ_1, e_1, and e_2 characterize the monetary policy regime, and we will use different sets of values to assess implications of different macroeconomic policy options in response to the oil price shock.

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[17] We undertook a number of sensitivity analyses assuming different values of α_1 and θ_1. The results presented below remain qualitatively the same.

| Table 1. Calibration of the Model	
σ	0.3
α_1	0.5
α_2	0.8
α_3	-2
ρ	0.5
ω^M	0.6
λ_1	0.5
λ_2	0.2
ω	0.4
β_1	0.8
μ_1	0.6
θ	0.25
δ_2	0.5
e_3	1.2

D. Analysis of Policy Mix and Implications for Macroeconomic Stability

Illustration of the model: the case of permanent terms-of-trade shock

38. **For illustrative purposes, this section starts with the analysis of the impact of a permanent oil price shock scenario.** Oil prices fall by about 60 percent in 2015, and remain weak at US$47/barrel in the medium term. The oil price shock is considered as unexpected and permanent, implying that rational economic agents expect at any point in time that future oil prices stay low at the current level of US$47/barrel.

39. **A permanent decline in oil prices has long-lasting real effects on the economy.** The size of the world oil price decline determines along with the structure of national account, the magnitude of domestic absorption adjustment. The terms of trade worsen permanently, forcing real downward adjustments in consumption and nonhydrocarbon production. Monetary and fiscal policies can help smooth the adjustment but they cannot offset it. Furthermore, regardless of the exchange rate regime, a negative terms-of-trade shock creates depreciation pressures ceteris paribus.

40.   The dynamics of inflation and the exchange rate depends on the monetary policy response, which varies with the exchange rate regime in place. A number of policy response scenarios are simulated to analyze the dynamics of relevant macroeconomic variables, in particular real growth, inflation and debt accumulation. We focus on monetary policy reaction under (i) a fully flexible exchange rate regime (i.e., under inflation targeting), (ii) a peg (i.e., the exchange rate is fixed at its pre-shock level) and (iii) a managed float that allows for a partial exchange rate depreciation. We also take into account the change in the fiscal policy stance that aims at smoothing real adjustment while ensuring debt sustainability. The results of these simulations are plotted in Figure 3.

Figure 3. Impulse Response Functions

(Permanent oil price shock)

Source : IMF staff calculations.
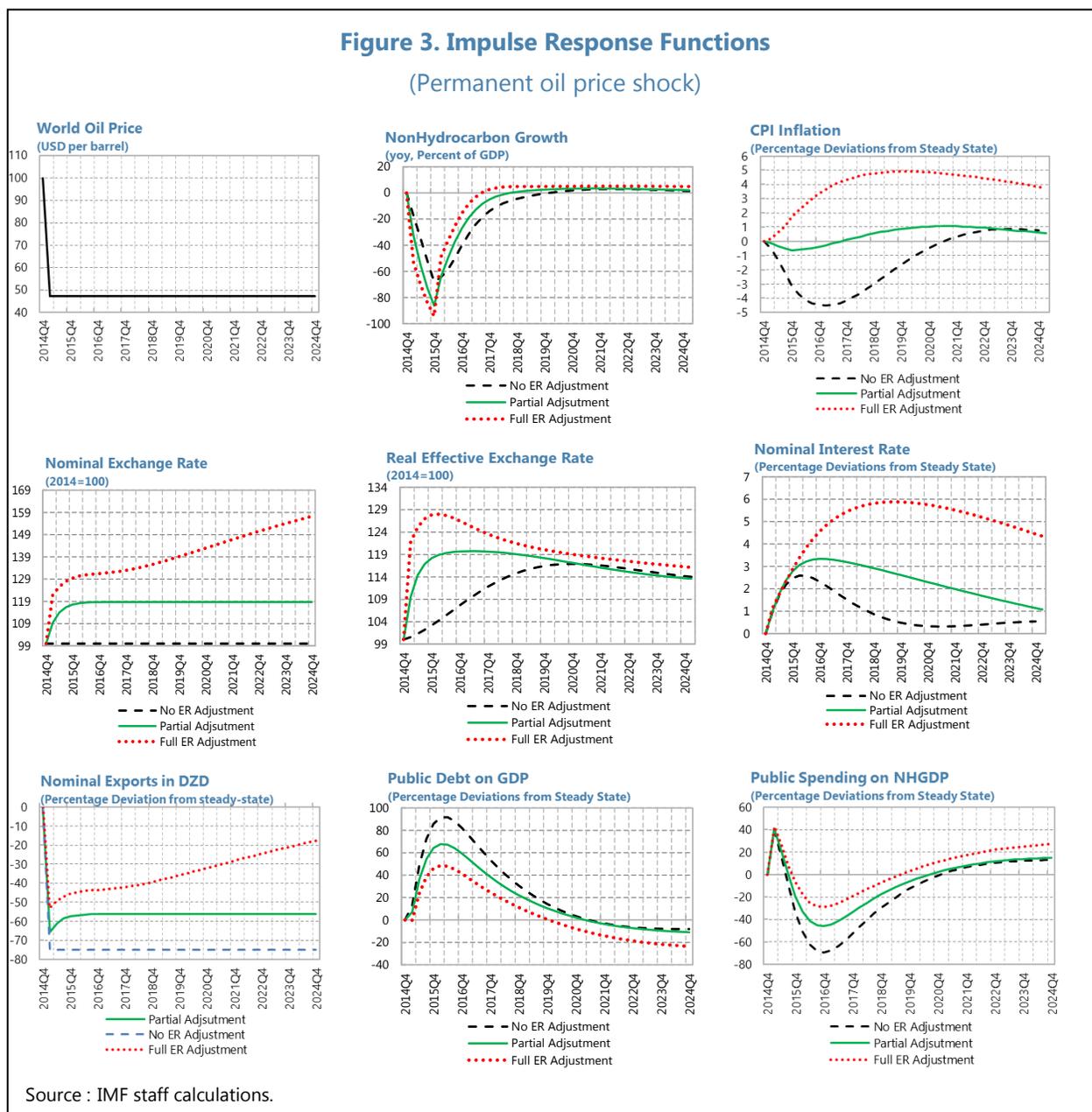
41.   When the central bank allows the exchange rate to depreciate, the transmission of the shock operates through two channels. On the supply side, exchange rate depreciation increases the marginal cost of production (Equation 16) and lowers demand for labor and imports, causing adjustments in the labor market (lower employment and real wages). On the demand side, consumers face higher inflation from rising prices of imports and a perceived reduction in income, due to lower wages and potentially lower fiscal transfers (Equation 2). At the same time, the depreciation increases oil export revenues in domestic currency, thus partially offsetting the adverse effects of the shock on fiscal revenues. This opens some space for countercyclical transfers that contribute to smoothing the consumption deleverage. However, as the government faces debt constraints, it adjusts its expenditure on domestic goods and services sharply to ensure that debt never exceeds the desirable (i.e., sustainable) level (Equation 8). Nonhydrocarbon production falls, both as a result of declining demand and supply.

42.   A fully flexible exchange rate regime could lead to a procyclical monetary policy response to inflationary pressures, increasing the potential for output losses.[18] The large and persistent term-of-trade shock worsens the country's external position and causes the dinar to depreciate by 40 percent by 2021 (Subplot 5), bringing the real effective exchange rate close to its equilibrium value. Large inflationary pressures emerge, with inflation peaking at 5 percentage points above the central bank target. Simultaneously, exchange rate depreciation inflates government revenues in domestic currency, leading to lower debt accumulation than under less flexible exchange rate regimes and reducing the size of the subsequent fiscal adjustment. In essence, greater exchange rate flexibility supports economic activity and smooths real adjustment. However, the strong monetary policy response increases interest rates sharply and reinforces the real effects of fiscal policy. Of course, these effects would be smaller assuming a more sluggish monetary response caused by a weaker monetary policy transmission mechanism (i.e., with lower e_3), or due to higher tolerance for higher inflation, with the central bank either not responding to the full impact of the shock on inflation or choosing to increase its inflation target.[19]

43.   Under a pegged exchange rate regime, there is a relatively large debt accumulation that increases debt sustainability concerns.[20] Smoothing private absorption through government transfers on the back of a large drop in hydrocarbon revenues (proportional to the fall in oil export revenues, Subplot 7), increases debt and creates debt sustainability issues (Subplot 9). As a result, the country's risk premium rises, pushing real interest rates higher and leading to higher debt accumulation than under the floating exchange rate regime (Subplot 6). When public debt becomes unsustainable (i.e., higher than the debt level at the steady state), the government starts tightening

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[18] To simulate a fully flexible exchange rate regime, we set δ_1 equal to 0.

[19] Implicitly, the central bank pays attention to real economic developments. Such a course may be desirable for restoring employment as wages are relatively inflexible. A higher inflation would help achieve the necessary downward adjustment in real wages faster.

[20] To simulate a peg regime, we set δ_1 and e_2 equal to 1 and 0.25, respectively.

its fiscal stance by cutting both expenditures on goods and services and transfers, causing a large contraction in demand through the channels described above. As a result, general prices drop sharply (subplot 3), particularly given the absence of inflationary pressures stemming from exchange rate depreciation and because of the contraction of the real economy.

44. **Under the intermediate exchange rate regime, monetary policy keeps the magnitude of depreciation at a level that mitigates GDP losses and inflationary pressures.** Assuming a partial exchange rate adjustment, the nominal effective exchange rate depreciates moderately compared to the IT regime (Subplot 5). The nominal depreciation makes imports more expensive relative to domestic production, and results in some substitution between imported and domestically produced goods. Therefore, real imports decline and contribute to reducing the trade deficit. At the same time, the fiscal policy response is stronger than under the IT regime due to the lower impact of exchange rate depreciation on fiscal revenues, resulting in lower debt accumulation. Compared to the peg regime, aggregate demand contraction is larger as the real effects of fiscal adjustment are amplified by the contractionary effects of monetary policy. The latter increases interest rates in response to higher inflationary pressures stemming from higher import prices.[21] As a result, macroeconomic volatility is lower than the IT regime, and public debt is more sustainable than in the peg regime.

A scenario consistent with WEO assumption

45. **A second set of simulations analyzes the impact of an oil price shock consistent with the January WEO update assumption** (Figure 4). Oil prices reach their trough of US$36 in 2016, and gradually stabilize around US$47 by 2021 (Subplot 1). Compared to the permanent oil price shock scenario discussed above, the WEO scenario is more severe as it entails an additional temporary negative shock in 2016, increasing the size of needed adjustment and inducing more volatility in the economy.

46. **As in the permanent shock scenario, the policy response faces a difficult tradeoff between price, output, and debt sustainability objectives.** The output fall (Subplot 2) and rise in inflation rate (Subplot 3) are larger, while debt accumulation (Subplot 4) is lower, under a pure float compared with a peg regime. Also, partial exchange rate flexibility achieves lower volatility in terms of deviation of inflation from the central bank target, while generating an output decline and debt-to-GDP ratio between the two extremes.

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[21] Note that interest rates partly increase due to higher country risk premium reflecting the increase in public debt (Equation 21).

Figure 4. Impulse Response Functions

(January WEO update assumption)
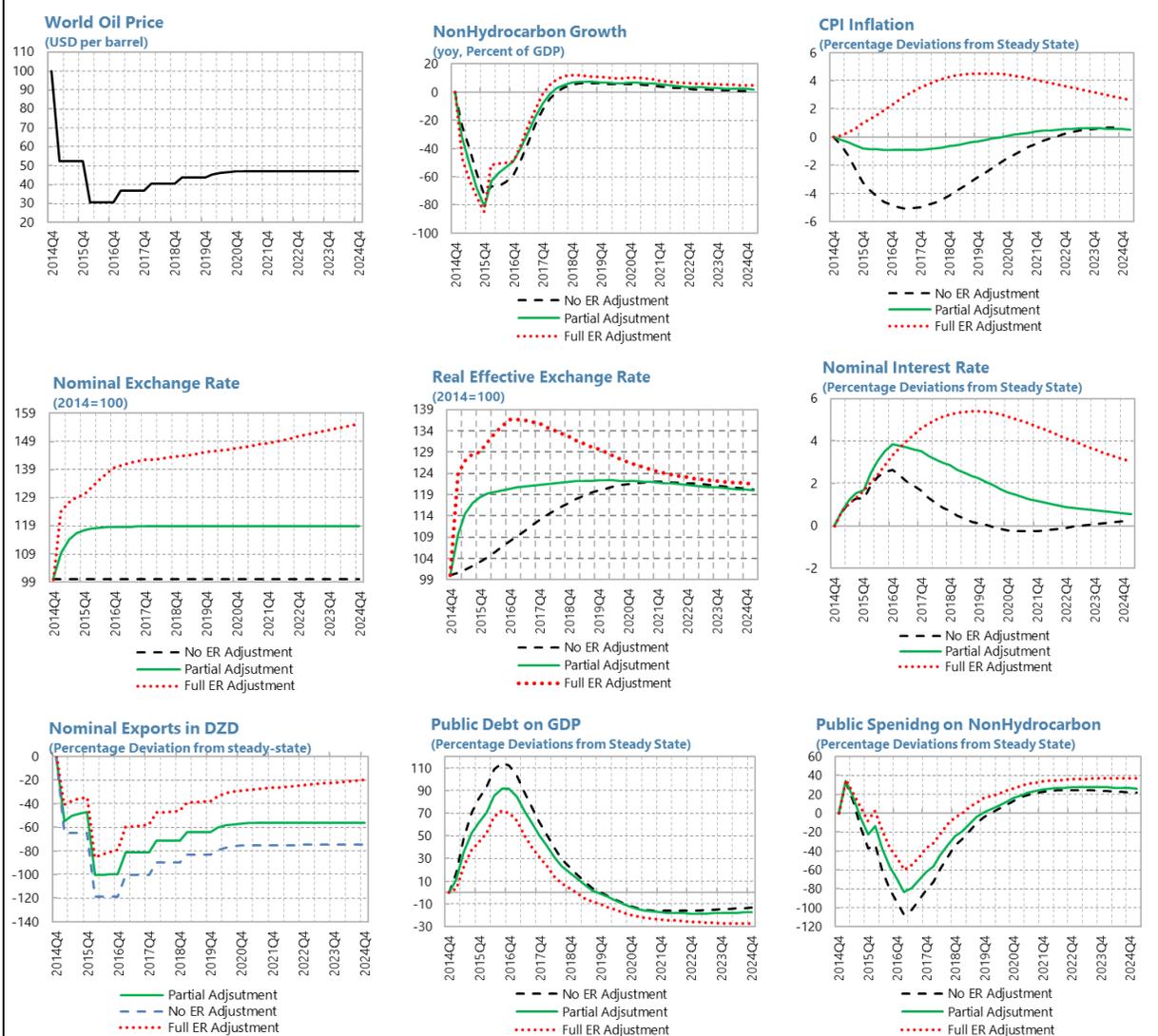
Source : IMF staff calculations.

47.   The authorities may aim at trading a somewhat larger output contraction for lower debt burden and greater price stability. Simulations comparing different exchange rate regime options suggest that:

- A fixed exchange rate shifts the burden of adjustment to the fiscal policy, leading to larger public debt accumulation and aggregate demand losses.

- Allowing the dinar to freely float leads to inflationary pressures, triggering a procyclical monetary policy response that reinforces the impact of fiscal tightening on demand, not only amplifying output contraction but also feeding back to higher inflation.

- A well-managed exchange rate float could better align the objectives of monetary and fiscal policies, resulting in lower output losses and inflationary pressures while ensuring fiscal sustainability.

E. Conclusions

48.   This paper develops a small structural model for Algeria. The model can be helpful in preparing baseline forecasts and analyzing policy options and trade-offs in response to a variety of shocks. By design, it is a relatively simple and tractable representation of the Algerian economy, allowing users to evaluate different policy responses to shocks. Furthermore, the model can be used as a forecasting tool, which provides complete national account forecasts including policy reactions. The model can serve to frame the discussion about the baseline forecast, by evaluating risks to the forecast and external shocks. In contrast to existing gap models *a la* Berg et al (2006), the model exhibits a stock-flow accounting, which allows us to analyze adverse effects of oil price shocks.

49.   Algeria needs to adjust to the low oil price realities. Without sustained policy adjustment, a protracted period of low hydrocarbon prices could set the country on an unsustainable trajectory of macroeconomic imbalances. The heavy reliance on hydrocarbons poses structural risks to Algeria's economy, and both monetary and fiscal policies face important challenges to respond to the ongoing oil price shock and preserve a positive outlook for growth, inflation and international reserves.

50.   Well-managed exchange rate flexibility can help the economy better adjust to the low oil price environment. Given the shallow and imperfect exchange market, the central bank should "lead" the market towards a path of exchange rate adjustment consistent with a medium-term internal and external equilibrium. However, exchange rate adjustment cannot substitute for fiscal and monetary policy adjustment. In addition, these need to be complemented by a structural reform strategy that aims at diversifying exports and replacing imports with domestic production to help preserve growth

Appendix I. Algeria: Microeconomic Foundations of the Model

Households

There is a continuum of infinitely-lived households who consume final goods, supply labor, receive government transfers, and save in banks deposits. The j-th household maximizes the expected discounted utility choosing consumption C_t, labor N_t and the amount of domestic and foreign bonds, B_t respective B_t^*:

$$E_0 \sum_{t=0}^{\infty} \beta^t \left[\ln \left(\frac{C_t(j) - \chi \bar{C}_{t-1}(j)}{1 - \chi} \right) - N_t(j) \right] \rightarrow_{C_t(j), N_t(j), B_t(j), B_t^*} max$$

Subject to a sequence of budget constraints at any point of time t:

$$P_t C_t(j) + B_t(j) + S_t B_t^*(j) = W_t N_t(j) + (1 + i_t) B_{t-1}(j) + (1 + i_t^*) S_t B_{t-1}^* + \Gamma_t$$

The expected stream of utility is weighted by a deterministic discount factor β. A household sets his intertemporal path of consumption taking into account the past aggregate consumption $\bar{C}$ —an assumption of the external habit formation with a smoothing parameter χ. The introduction of the habit formation setup is motivated by empirical evidence that monetary policy shocks trigger a hump-shaped response of consumption. The price index of households' consumption bundle is denoted as P_t.

Households finance their spending using their labor income and revenues from government bonds. Furthermore, they receive Γ_t as lump-sum net payments from government—lump-sum taxes adjusted by transfers. There is government's ownership of the whole economy, including oil industry in particular. Also, households receive W_t for each unit of their labor N_t. Nominal wages are fully flexible implying pro-cyclical real wages.[1] If needed, we make wages sticky later based on empirical observations.

Households save using government bonds. Alternatively, we can label government bonds as commercial banks deposits (we just need to check whether households/agents are allowed to hold foreign currency deposits or/and bonds). In addition to domestic bonds, households hold foreign currency bonds, B_t^*. Both domestic and foreign currency bonds bear an interest rate, i_t and i_t^*, and they are for the purpose of derivation considered as risk-free. S_t denotes the nominal exchange rate in the standard notation (units of domestic currency which pay for one unit of foreign currency).

Maximizing the household problem with respect to the budget constraint a following set of optimality conditions can be obtained. The first condition states that a representative household supplies labor until the marginal rate of substitution between consumption and leisure equals to the real consumption wage:

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[1] This feature can be easily changed assuming differentiated types of labor supplied by households. In such a case households exhibits a monopolistic power setting their wages.

$$\frac{W_t}{P_t} = \frac{C_t(j) - \chi \bar{C}_{t-1}}{1 - \chi}$$

The flow of household's consumption is determined by a modified Euler equation which balances marginal utility from consumption today and tomorrow (derivative with respect to domestic bonds):

$$C_{t+1} - \chi C_t = \frac{P_t}{P_{t+1}}(C_t - \chi C_{t-1})\beta(1 + i_t)$$

The non-arbitrage condition implies that households do not distinguish between domestic and foreign bonds as both bear the same interest rate revenues in domestic currency. In fact, taking derivative of the Lagrangian of the problem, we get: $(1 + i_t)S_t = (1 + i_t^*)S_{t+1}$, which represents the common UIP condition.

Besides the above-mentioned equations, optimality conditions consist of the budget constraint and the transversality condition. As all households are identical, we can remove the index j from all equations above.

Domestic intermediate production

There is a continuum of intermediate goods producers, out of the oil sector, who are endowed with Cobb-Douglas production function. These producers use just households' labor N_t to produce intermediate goods. Firms are fully competitive and there is no physical capital so far to keep the model simple.

Firms maximize their profits choosing labor demand N_t as follows:

$$E_0 \sum_{t=0}^{\infty} \Omega_{0,t}\left[P_t^{Dy}Y_t^D - W_t N_t\right] \to_{N_t} max$$

while they face the following production constraint

$$Y_t^D = (AN_t)^{1-\gamma}$$

In the optimization problem above P_t^y denotes intermediate prices, Y_t^D states for domestic intermediate product. As firms are owned by households the stochastic discount factor $\Omega_{t|t+1} = \frac{\Lambda_{t+1}}{\Lambda_t}$ is used to weigh profits where Λ_t denotes the Lagrange multiplier from households optimization problem. Finally, A denotes labor-augmenting technology.

The first order conditions of the firms' optimization problem constitute demand function for the productive factor:

$$\frac{(1-\gamma)Y_t^D}{N_t} = \frac{W_t}{P_t^{Dy}}$$

Final goods producers and aggregators

There is infinity of intermediate goods producers who use domestic intermediate production along with imports to produce final consumption goods that are consumed domestically either by households or government. These producers maximize profit and they are endowed with Leontief production function. Firms maximize their profits choosing the amount of labor,

$$E_0 \sum_{t=0}^{\infty} \Omega_{0,t} \left[P_t^y Y_t - P_t^{Dy} Y_t^D - P_t^* S_t M_t \right] \to_{N_t} max$$

They face a production constraint

$$Y_t = \min([Y_t^D, M_t])$$

The optimization problem implies that production factors are used in constant shares in production. Furthermore, these shares are not price elastic. Finally, the price of intermediate good, P_t^Y, equals the linear combination of domestic intermediate production prices and import prices. Final good producers are monopolistically competitive firms experiencing a rare opportunity to set prices. The staggered price setting is introduced following Calvo's setup.

Final goods producers transform intermediate production to final goods exploiting linear production function:

$$\bar{Y}_t(f) = Y_t(f)$$

The f-th producer of final goods transforms $Y_t(f)$ of the intermediate product into $\bar{Y}_t(f)$ units of final goods. The f-th producer maximizes profit choosing price $P_t(f)$ and $Y_t(f)$ facing downward sloping demand for his output and a rare probability $1 - \xi_p$ to optimize prices. The optimization problem of the final goods producers can be written as:

$$E_0 \sum_{t=0}^{\infty} \xi_p^t \left[P_t(f) \bar{Y}_t(f) - P_t^y Y_t(f) \right] \to_{P_t(f), Y_t(f)} max$$

Subject to

$$\bar{Y}_t(f) = \left(\frac{P_t(f)}{P_t} \right)^{\frac{1+\nu^p}{\nu^p}} \bar{Y}_t$$

Final goods producers who cannot re-optimize use a full backward indexation on overall price inflation. The linear version of first order conditions for this optimization problem consists of the standard Phillips curve which is partially forward looking. Optimal flexible prices are set as a markup MRK over production costs which equal to P_t^y.

$$\Delta p_t = \frac{1}{\beta} \Delta p_{t-1} + \frac{\beta}{1+\beta} \Delta p_{t+1} + \frac{(1-\xi_p)(1-\xi_p\beta)}{\xi(1+\beta)} \log \left(\frac{P_t^Y MRK}{P_t} \right)$$

Distributors

Outputs of final goods producers are collected by fully competitive distributors. These distributors aggregate different types of final goods and sell it as a homogenous product. As final goods are not exported, the final product is divided into household consumption and government spending G_t.

$$Y_t = C_t + G_t$$

Distributors split the total amount of demanded consumption $\bar{Y}_t$ among final goods producers given their prices $P_t(f)$. They seek to minimize total costs:

$$\int_0^1 P_t(f)\bar{Y}_t(f)df \rightarrow_{\bar{Y}_t(f)} min$$

while servicing the total demand

$$\bar{Y}_t = \left(\int_0^1 \bar{Y}_t(f)^{\frac{1}{1+v_p}}\, df\right)^{1+v_p}$$

Where v_p determines the price elasticity of substitution among types of goods.

Oil sector—Exporters

There is no optimization in the oil sector. There is only one firm assumed in the model. The firm is owned by the government and it just pumps oil. Real production of the oil firm follows a random walk process.

$$\Delta Y_t^{OIL} = \rho \Delta Y_{t-1}^{OIL} + \varepsilon_t^{OIL}$$

As a result, we might think about it as exporters are endowed with a good which price is determined in the international market. The price is not affected by the domestic business cycle. The firm sales all production priced by the world oil price level.

$$Revenues_{oil} = P_t^{*oil} S_t Y_t^{OIL}$$

Net foreign assets

Substituting profits and net government transfers into households' budget constraint, the equation for net foreign asset accumulation can be derived as follows:

$$B_t = (1 + prem_{t-1})(1 + i_{t-1}^*)B_{t-1}\frac{S_t}{S_{t-1}} + P_t^{oil}X_t^{oil} - P_t^m M_t$$

The net foreign asset position B_t (a positive value denotes borrowing from abroad) is function of the current account where P_t^{oil} denotes export prices of X_t^{oil}, and M_t states for real imports. The net foreign asset position changes along with a foreign nominal interest rate i_t^* adjusted by premium $prem_t$ and exchange rate appreciation.

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SUBSIDY REFORM IN ALGERIA[1]

The collapse in oil prices has placed severe strains on Algeria's public finances and focused attention on the need for subsidy reform. Although integral to the country's social contract, Algeria's subsidies fail to provide efficient support to the poor, are too costly to sustain, and create distortions that are harmful to the economy and the environment. Rolling back subsidies will be challenging given their pervasiveness, the complexity of the system, and the need to mitigate the social impact of the reform. However, experience in other countries suggests that subsidy reform, if carefully planned and communicated, can be successful and strengthen, rather than undermine, social protection, thereby promoting more inclusive growth in the long term. This paper examines Algeria's main subsidies and proposes reform strategies, drawing on cross-country experiences.

A.   Introduction: Why Subsidy Reform?

1.   Even before oil prices began their precipitous decline, Algeria's fiscal policy was on an unsustainable path. Algeria recorded six consecutive fiscal deficits between 2009 and 2014—despite oil prices averaging nearly US$100/barrel—as government spending surged and slumping hydrocarbon production led to a decline in hydrocarbon revenues. Fiscal savings, which peaked at 43.3 percent of GDP in 2009, fell to 25.2 percent by 2014. At the time of the 2014 Article IV consultation, when oil prices were still just under US$100/barrel, IMF staff warned that Algeria would need to undertake significant and sustained fiscal consolidation in the coming years to restore fiscal sustainability and ensure intergenerational equity.

2.   The collapse in oil prices—together with the prospect of low oil prices for years to come—increased the urgency to act. Following the decline in oil prices to US$53/barrel (on average) in 2015, hydrocarbon revenues fell to their lowest level since 2004, resulting in a sharp widening of the fiscal deficit to an estimated 16.4 percent of GDP. With oil prices expected to average US$37 in 2016 and rise only gradually to US$52/barrel by 2021, IMF staff project that, even under the assumption of sustained fiscal consolidation over the medium term, fiscal savings will be depleted and government debt will increase significantly. In this context, Algeria can ill afford to delay fiscal consolidation without risking a sharper adjustment down the road.

3.   Subsidy reform should be an integral part of Algeria's fiscal consolidation strategy. Successful fiscal consolidation depends on both mobilizing more revenues and rationalizing expenditures. On the revenue side, Algeria must find ways to increase nonhydrocarbon revenues, given finite hydrocarbon resources and the volatile nature of oil prices. On the expenditure side,

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Algeria needs to contain current spending while refraining from indiscriminate cuts to growth-enhancing capital expenditures. Subsidy reform, if done correctly, would generate more revenues and contribute to a reduction in current spending.

4.   **Subsidy reform would strengthen, rather than undermine, social protection and promote more inclusive growth.** Algeria, like many other oil-exporting countries in the region, has relied heavily on subsidies as a tool to provide social protection and share natural resource wealth. Although some of the money spent on subsidies does benefit the poor, the system as a whole is highly regressive, benefiting mainly the better-off. A well-targeted cash transfer system would be a more efficient and cost-effective way to provide social protection, and therefore should be a key component of Algeria's subsidy reform strategy. By helping ensure fiscal sustainability, freeing up resources for growth-enhancing spending, and focusing social protection on those who truly need it, subsidy reform would foster higher and more inclusive growth.

5.   **The government's decision to increase energy prices starting in 2016 is an important step in the right direction.** The 2016 budget law increased the value added tax from 7 percent to 17 percent on the sale of diesel, the consumption of natural gas beyond 2,500 thermal units/quarter, and the consumption of electricity beyond 250 KWh/quarter. In addition, the budget law increased the tax on petroleum products (TPP) from 1 dinar to 2.91 dinars on the price of gasoline and diesel. Separately, the government increased electricity and natural gas rates (before taxes) while leaving unchanged the rates applicable to businesses and households that consume the least. Together, these measures resulted in the first increases in energy prices since 2005 and constituted an important first step toward subsidy reform.

6.   **This paper proposes strategies for subsidy reform, drawing on international experience.** Section B examines Algeria's main subsidies and their fiscal cost. Section C discusses the economic consequences of subsidies. Section D lays out the key elements of a successful subsidy reform, and Section E analyzes the potential economic impact of such a reform. Section F concludes.

B.   What are the Main Subsidies, and How Much Do They Cost?

7.   **Algeria's subsidies are both explicit and implicit and cover energy products, housing, food, education, and interest rates.[2]** Explicit subsidies are included in the budget and have a direct fiscal cost. The main explicit subsidies are for housing, food, education, interest rates, electricity, natural gas and water. Implicit subsidies are not expenditure items in the budget; nevertheless, they carry an important opportunity cost in the form of foregone revenues, directly for the budget or for

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[2] The Algerian budget lumps explicit subsidies together with social transfers, such as cash transfers to families, retirees, and former combatants; transfers related to health care; as well as an extensive array of tax expenditures. These items are not considered in this paper.

state-owned utilities.[3] Another indirect cost of implicit subsidies is that they have led to episodic bailouts of state-owned utilities that are required to supply services at below market value. Implicit subsidies comprise energy products and, to a smaller extent, housing.

- **Energy subsidies relate to fuel, natural gas, and electricity, whose prices are set administratively below their market value.** Fuel prices are fixed at every point in the supply chain, from production to refining to distribution. Despite the recent increase in fuel taxes, final prices at the pump for gasoline, diesel, and other fuels in Algeria remain among the lowest in the world.[4] Although the 2016 budget law increased taxes on electricity and natural gas consumption, underlying tariffs have been frozen since 2005 and are well below supply costs. Consequently, the state-owned utility Sonelgaz, which is responsible for natural gas and electricity distribution, has been running structural deficits. In addition to these implicit energy subsidies, the government provides smaller explicit subsidies for rural electrification and the public distribution of natural gas and water.
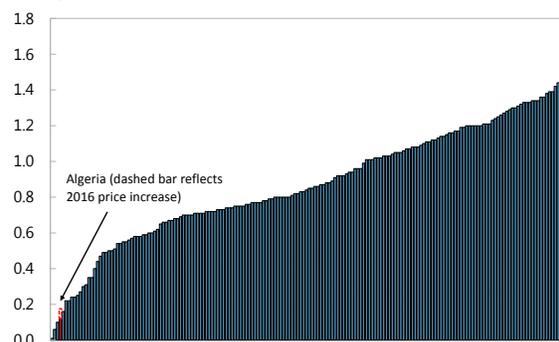
World Gasoline Prices, 2015
(US$ per liter)

Algeria (dashed bar reflects 2016 price increase)
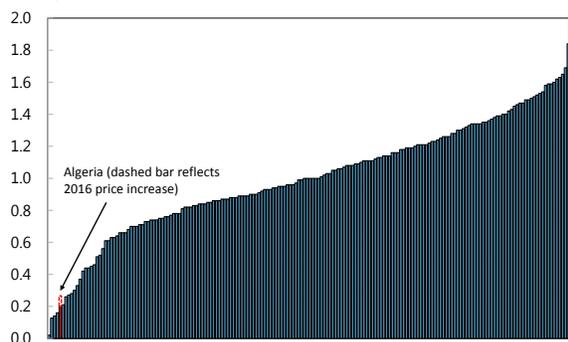
Sources: GlobalPetrolPrices.com; and IMF staff calculations.

World Diesel Prices, 2015
(US$ per liter)

Algeria (dashed bar reflects 2016 price increase)

Sources: GlobalPetrolPrices.com; and IMF staff calculations.

- **Housing subsidies are aimed at reducing Algeria's housing shortage.** The combination of a rapidly growing population, urban migration, and a decline in cohabitation has resulted in a demand for housing unmatched by supply. To address this shortage, the government has developed a number of programs to provide affordable housing. Explicit housing subsidies are channeled through the National Housing Fund (*Fonds National du Logement*) and support access to public housing (both rental housing and housing for purchase). Implicit housing subsidies stem from the government's provision of land at essentially zero cost for public housing programs.

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[3] The authorities publish an estimate of the cost of implicit subsidies in the annual *Note de Présentation de la Loi de Finances.*

[4] As of December 2015, Algeria had the fifth lowest price of gasoline and the fourth lowest price of diesel out of 183 countries worldwide (source: GlobalPetrolPrices.com).

- **Food subsidies cover several basic items.** These include bread and durum wheat products, barley, pasteurized milk reconstructed from milk powder, refined cooking oil, and white crystallized sugar. The government covers the difference between the market cost of raw materials and their regulated wholesale price. In the case of wheat, barley, and milk, which account for the bulk of food subsidies, the government fixes the transfer price of raw materials to domestic producers and reimburses the relevant regulating agency for the differential between the international market import price and the regulated transfer price. (The regulating agencies control the domestic and imported supply of raw materials and their distribution.)

- **Education subsidies promote access to the public education system.** Subsidies (as well as transfers) help cover the cost of school supplies, food, housing, transportation, and scholarships for eligible students, with food representing the largest component. Most education subsidies are directed to the tertiary education system.

- **The government subsidizes interest rates to encourage investment and entrepreneurship.** All Algerian companies benefit from reduced interest rates on investment loans, in addition to a zero-interest grace period for a period of up to five years. Subsidized interest rates are also featured in government programs that target specific activities or regions.

8.   **Together, these subsidies cost an estimated DA 2,293 billion (US$22.8 billion) in 2015, equal to 13.6 percent of GDP.** Energy subsidies accounted for over half this amount, followed by housing, food, and interest rate subsidies. Implicit subsidies (essentially energy subsidies) remain larger than explicit subsidies.[5] Total subsidies in 2015 cost twice the combined budgets of the health and education ministries and were equal to three-fourths of total public investment. The cost of energy subsidies is considerably higher if one takes into account negative externalities from energy consumption, including congestion, pollution and global warming.
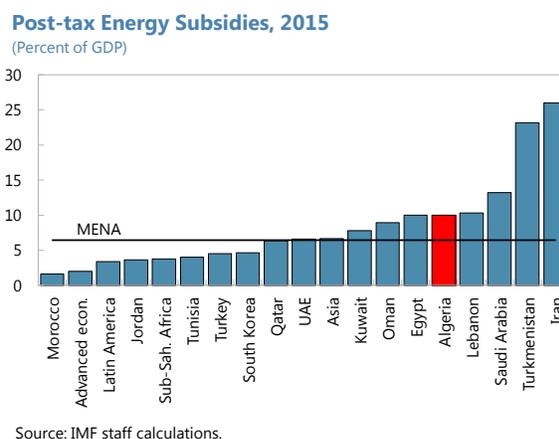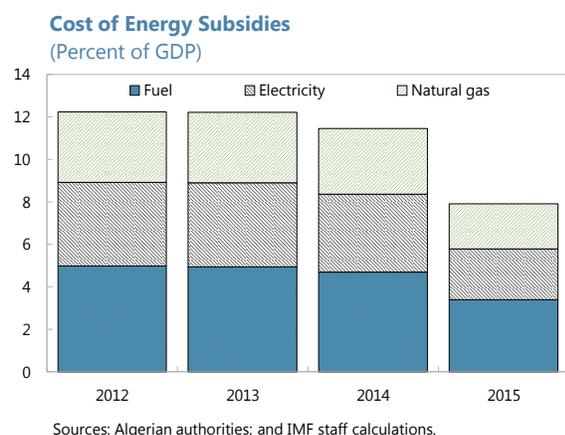
Subsidies, 2015

	DA billions	Percent of GDP
Explicit	926	5.5
Housing	357	2.1
Education	109	0.7
Food	225	1.3
Electricity, natural gas, water	74	0.4
Interest rates	160	1.0
Implicit	1,367	8.1
Housing (2013 estimate)	67	0.4
Energy (fuel, natural gas, electricity)	1,300	7.7
Total	2,293	13.6

Sources: Algerian authorities; and IMF staff estimates.

9.   **Energy subsidies have become less costly thanks to the fall in oil prices, but remain significant.** The cost of energy subsidies has declined sharply with the fall in oil prices, reflecting the narrowing of the gap between the price of the energy supplied and the benchmark (free-market) price. Nevertheless, at approximately 7.9 percent of GDP in 2015, energy subsidies remain significant. A recent IMF study estimated that energy subsidies in Algeria amounted to 10 percent of GDP in 2015 on a "post-tax" basis—that is, taking into account tax subsidies that exist because taxes

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[5] The estimated cost of energy subsidies does not reflect the cost associated with episodic bailouts of state-owned utilities (typically in the form of debt purchases).

on energy products do not cover negative externalities associated with energy consumption (e.g., climate change, pollution, congestion).[6] Algeria's post-tax energy subsidies are higher than the average in the Middle East and North Africa (MENA).

Cost of Energy Subsidies
(Percent of GDP)

Sources: Algerian authorities; and IMF staff calculations.

Post-tax Energy Subsidies, 2015
(Percent of GDP)

Source: IMF staff calculations.

## C.   What Are the Economic Consequences of Subsidies?

10.   Subsidies have important economic consequences, of which the fiscal cost is the most obvious. Algeria's subsidies entail high fiscal or quasi-fiscal costs and crowd out budgetary space for more growth-oriented and less regressive spending, such as on health, education, infrastructure and well-targeted social transfers. Algeria's subsidies also create fiscal risks. Most of the subsidies are universal in nature, meaning there is a single subsidized price with no restrictions on consumption. Consequently, there is no cap on the cost of the subsidy. Higher oil prices increase the cost of implicit energy subsidies. Higher international food prices increase the cost of explicit food subsidies.

11.   Subsidies disproportionately benefit middle- to upper-income groups, and are therefore inefficient as a social protection tool. Although subsidies do benefit the poor to some extent, many are regressive and reinforce, rather than redress, existing inequalities. Households in the richest quintile consume, on average, six times more subsidized fuel products than households in the poorest quintile. Similarly, the richest households consume 61 percent more subsidized electricity, 58 percent more subsidized water, and 18 percent more subsidized food products than the poorest households. The implication of these consumption patterns is that richer households capture most of the benefits of subsidies. This regressive outcome is consistent with the universal nature of most subsidies, which impose no restrictions on income.

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[6] See Coady, Parry, Sears, and Shang (2015).

Monthly Household Expenditures on Subsidized Goods, 2011

(Dinars)

	Food	Butane	Fuel	Electricity	Water	Total
Quintile 1	56,526	5,210	2,463	12,128	5,066	81,393
Quintile 2	64,367	5,456	3,979	13,779	6,468	94,049
Quintile 3	66,351	4,592	6,555	15,281	6,470	99,249
Quintile 4	66,647	4,896	10,213	16,385	7,508	105,649
Quintile 5	66,498	3,842	14,719	19,542	8,001	112,602
Average	64,499	4,728	8,225	15,788	6,842	100,082
Q5/Q1 ratio	1.18	0.74	5.98	1.61	1.58	1.38
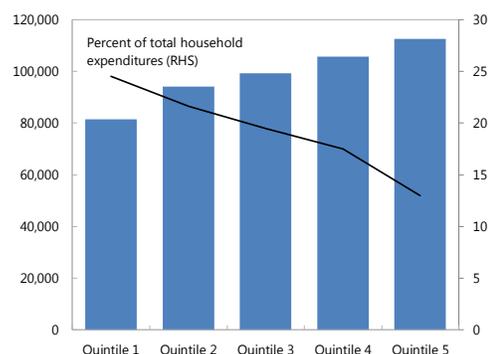
Source: Office National des Statistiques, Enquête Nationale sur les Dépenses de Consommation et le Niveau de Vie des Ménages, 2010-2011.
Note: Food includes bread, flower, semolina, soy oil, pasteurized milk, and crystallized sugar.

12.   By encouraging consumption, subsidies weaken Algeria's external and fiscal positions.
Low energy prices have fueled rapid growth in domestic energy consumption. Since electricity and natural gas prices were fixed in 2005, Algeria's energy intensity has grown 19.5 percent, in contrast with declining trends observed in other parts of the world outside of MENA.[7] To meet rapidly rising demand, Sonelgaz plans to double its production capacity by 2025 despite its precarious financial position. Domestic consumption of hydrocarbon products has increased by 65 percent since 2005 while production has declined steadily, squeezing exports and contributing to a deterioration of the balance of payments. Lower export volumes have also translated into significant hydrocarbon revenue losses for the government. Since peaking at 37.0 percent of GDP in 2008, hydrocarbon revenues have declined over time, reaching 14.1 percent of GDP in 2015, even though oil prices averaged US$89/barrel during the intervening period.

Change in Energy Intensity, 2005-2012
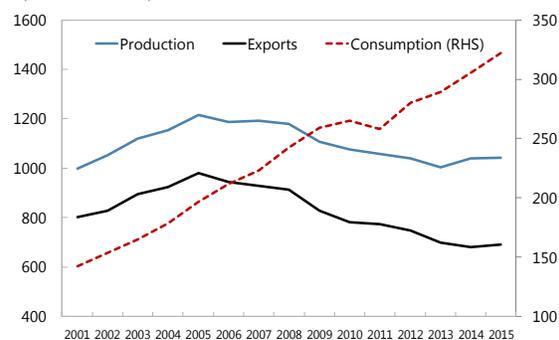(Percent, kg of oil equivalent/$1000 GDP using constant 2011 PPP GDP)
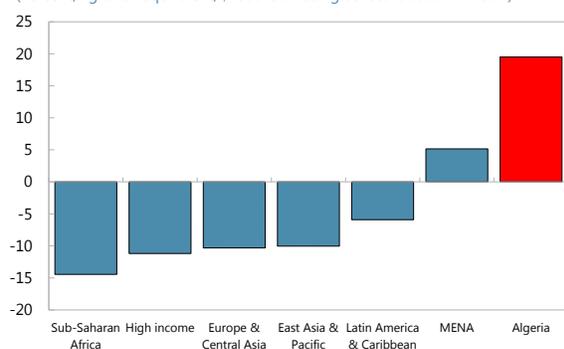
Source: World Development Indicators.

Hydrocarbon Production, Consumption, and Exports
(Millions of barrels)


Sources: Algerian authorities; and IMF staff calculations.

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[7] Source: World Bank, *World Development Indicators*. Energy intensity is measured as the kilogram of oil equivalent of energy use per US$1,000 GDP (constant 2011 PPP).

13.   Subsidies lead to economic and environmental distortions. Energy subsidies artificially promote capital-intensive industries, creating a bias against labor in a country that is grappling with large youth unemployment. Furthermore, large price differentials with neighboring countries create incentives for smuggling. The authorities estimated that, in 2012, 1.5 billion liters of gasoline and diesel fuel, equal to a quarter of domestic production, were smuggled into neighboring countries where their prices are three to five times higher. Energy subsidies also reduce the incentive to invest in energy efficiency, public transportation, and renewable energy. By inducing energy overconsumption, they aggravate local pollution, traffic congestion, and global warming. Subsidies lead to overconsumption and distortions in other sectors as well. For example, imports of subsidized powdered milk and wheat are among the highest in the world on a per-capita basis, reflecting unusually high levels of domestic consumption and the crowding out of domestic producers who cannot compete at the subsidized price. In the housing sector, the government's dominant role has had the unintended consequence of delaying financial sector deepening by discouraging the development of market mechanisms for housing finance.

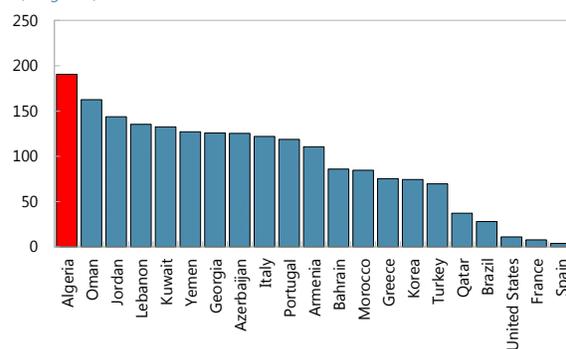**Imports of Powdered Milk per Capita, 2014**
(Kilograms)
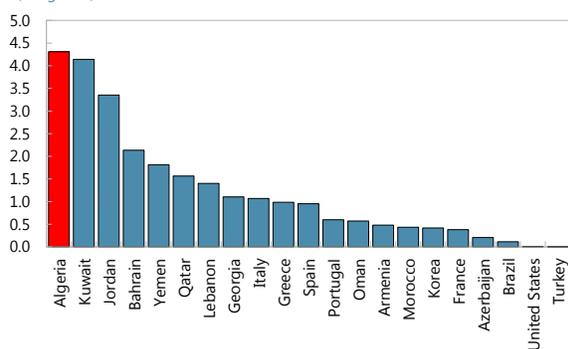
Sources: Comtrade, World Development Indicators, and IMF staff calculations.

Imports of Wheat per Capita, 2014
(Kilograms)

Sources: Comtrade, World Development Indicators, and IMF staff calculations.

D.   What are the Key Elements of Successful Subsidy Reform?

14.   International experience helps draw useful lessons for the design of a subsidy reform. In a 2014 study, IMF staff developed a rigorous empirical approach to identify the key determinants of successful subsidy reform. The approach built on existing literature while focusing on factors that are particularly relevant for MENA countries, namely political economy considerations, the macroeconomic environment, social safety nets, and mitigating measures.[8] The study identified six factors that tend to be associated with successful subsidy reform:

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[8] The study covered 25 episodes of food and fuel subsidy reforms in 15 low- and middle-income countries from different regions in the world, including seven MENA countries, three countries in Africa, three in Latin America, and one country case each in Europe and Asia. The analysis combined narrative-based country case studies with a quantitative analysis of variables related to the reform episodes.

- *Sufficient reform preparation, gradual pace of adjustment, and broad scope of reform.* A reform strategy that is well prepared is more likely to succeed. In particular, the design of the reform should be informed by a thorough analysis of the incidence of subsidy removal.[9] Phasing out subsidies gradually tends to more successful than a shock approach, as it gives households and enterprises time to adjust to price increases and governments time to put in place mitigating measures. Too sharp an increase in prices can generate intense opposition to reform, as happened with fuel subsidy reform in Mauritania in 2008. Finally, successful subsidy reform tends to be ambitious in scope, targeting a wide range of products. In some cases, successful subsidy reform has been part of a broader structural reform program.

- *Strong government leadership, communication, and consensus building.* Successful subsidy reform depends on government leadership that has ownership of the reform and is fully committed to it. A well-designed communication campaign is essential to help generate broad political and public support. It should explain the cost of subsidies (including the distortions they create), who benefits from them, and how the public stands to gain from subsidy reform. A key component of a successful communication strategy involves strengthening transparency in reporting subsidies in the budget. Since the majority of Algeria's subsidies are implicit and are not reflected in the budget, the authorities should make an effort to explain to the public how these subsidies work and how much they cost. Consensus building is also important. Policymakers should consult with key stakeholders, including vested interests that stand to lose from reform, to try to win their support.

- *Introduction of mitigating measures to soften the impact of the reform on the poor.* Subsidy reform is more likely to be successful if governments introduce measures to mitigate the impact of price increases on the poor. Mitigating measures are important both for protecting the poor and increasing society's broader acceptance of reform. It can be tempting for governments to extend mitigating measures to the middle class—for example, through wage increases or tax cuts—but such measures suffer from lack of targeting, negate the cost savings of subsidy reform, and are not associated with better reform outcomes based on country experiences.[10]

- *Favorable economic and political conditions.* Ideally, subsidy reform should be undertaken in a context of high economic growth and low initial inflation. This finding may reflect public resistance to further economic losses and further erosion of real incomes when growth is low and inflation is high. Pressure to reduce fiscal deficits typically plays a positive role, consistent

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[9] Thanks to a household census conducted in 2011, and with technical assistance from the World Bank, the Algerian authorities have been able to evaluate the impact of subsidy removal on household welfare and government revenues.

[10] Jordan eliminated fuel subsidies in late 2012 and replaced them with cash transfers targeted to families with an annual income below JD 10,000 (some 70 percent of the population), provided only when oil prices are above US$100 per barrel. The World Bank concluded that households were, on average, over compensated, and the authorities subsequently sought to improve targeting by adding variables other than income for means testing (such as ownership of land and cars).

with the finding that subsidy reform is more likely to be successful when it is part of a broad-based fiscal strategy. With respect to political conditions, more successful reforms are associated with a multiparty government. Algeria's starting point for subsidy reform is mixed. Growth is slowing, but the pressure to reduce fiscal deficits is very much present.

- *Support from international partners, particularly technical assistance.* International partners can play an important role in supporting domestic reform efforts. In addition to providing political legitimacy and peer pressure, international partners can also offer critical technical assistance. The IMF study found that 88 percent of cases where the reform was undertaken with technical assistance were associated with a successful outcome. Algeria benefited from an IMF technical assistance mission on subsidy reform in 2013, and it is currently receiving technical assistance from the World Bank on the incidence of subsidy reform.

Main recommendations in the case of Algeria

15.   Algeria should sequence price increases across different products while putting in place a targeted cash transfer program. The government should gradually move from the current system of universal subsidies on goods and services to a program of targeted cash transfers to low-income households. Price increases should be spread over time and vary by product. The most costly and most regressive subsidies should be tackled first, provided that the government can implement mitigating measures to protect the poor. A well-targeted cash transfer program can be built on existing infrastructure, but reforms will be necessary and should be initiated as soon as possible.

16.   In light of their large fiscal cost, regressive nature, and negative externalities, energy subsidies should be first in line for reform. Fuel price increases should initially be larger for products that are consumed more by higher-income households and by industry. As social safety net mechanisms are improved, subsidies on other fuels that are more important in the budgets of poor households (such as butane) can be phased out gradually, and budgetary savings can be partly used to finance targeted transfers to those households. Subsidy reform in the natural gas and electricity sector could also take a gradual and sequenced approach. A critical first step is to raise the price of natural gas and electricity for businesses and households that consume large amounts of natural gas and electricity, building on the existing tariff structure. For other consumers, prices could be spread over a longer period. In parallel, efforts should be made to reduce losses and improve efficiencies in the electricity sector, which would reduce the price increases necessary to eliminate the subsidy.

17.   A depoliticized and rules-based mechanism for setting prices should be adopted. Many countries have successfully implemented reforms only to see subsidies reappear when international prices increased. Others have been reluctant to pass through reductions in international prices to achieve fiscal gains, leading to unintended losses of competitiveness for domestic industries. Adoption of a well-designed, automatic pricing mechanism, especially when communicated clearly to the public, can reduce the chances of reform reversal by distancing the government from pricing decisions; it can also help cap the cost of the subsidy while smoothing price fluctuations. The

responsibility for implementing an automatic pricing mechanism should be given to an independent body to help shield it from political pressures.

18.   As a first step toward building a well-targeted cash transfer system, the government should conduct a thorough review of the country's social safety net. Algeria's social safety net programs were designed in the 1990s in a context of violence and insecurity and are no longer adapted to today's social needs. They are numerous and fragmented, they allow for the duplication of benefits, and their fiscal sustainability is a source of concern. A thorough review of these programs is necessary to identify which could be scaled up and modernized and which should be merged or eliminated. The Inter-Agency Social Protection Assessment, a set of tools created by the World Bank and other international organizations, could help the Algerian authorities assess existing programs and prioritize reforms.

19.   Algeria needs a social protection strategy that addresses existing coordination problems, improves targeting, and supports fiscal sustainability with clear eligibility criteria and exit conditions. When designing eligibility criteria, the government should draw on poverty scoring cards for households and assess the impact of subsidies among different income groups. It should aim to build a centralized registry of beneficiaries. Some universal transfers may remain, but the objective should be to improve targeting. Given the complexity of the system, a gradual approach to rationalizing existing programs should be adopted, supported by a well-designed communication campaign.

E.   What Would Be the Impact of Subsidy Reform?

Macro-fiscal impact

20.   Subsidy reform would strengthen Algeria's fiscal position. At a time when fiscal consolidation is paramount, subsidies have become too costly to sustain. One measure of the vulnerability of Algeria's fiscal position is the fiscal breakeven price—that is, the theoretical price of oil that would yield a balanced budget in a given year under current policies. Algeria's fiscal breakeven price is one of the highest in MENA, despite having declined somewhat in 2015 thanks to an increase in non-hydrocarbon revenues. Subsidy reform would strengthen the fiscal position by both increasing revenues and lowering expenditures. Although an increase in cash transfers would, appropriately, offset some of the fiscal savings, the net impact on the budget would be positive as long as the transfers were targeted.

Fiscal Breakeven Oil Prices
(Dollars per barrel)
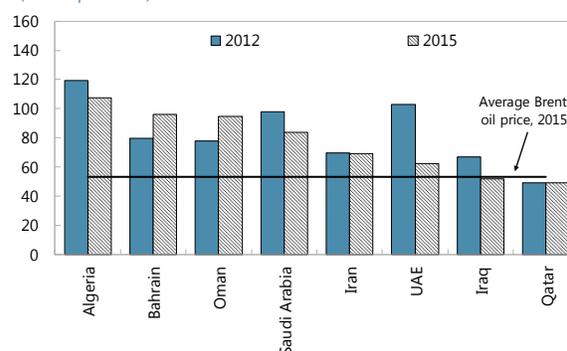
Source: Middle East and Central Asia Regional Economic Outlook database.

21.   Subsidy reform could have a negative impact on growth in the short term, depending on other policies implemented at the same time. The removal of subsidies is equivalent to a

reduction in current spending and could have a dampening effect on growth. However, this effect can be reduced by redirecting some of the savings to the poor (who have a high propensity to consume) and to productive investments. Increases in energy prices will result in higher input costs for firms, constituting a negative shock to the productive sector. The magnitude of the shock will vary depending on firms' direct use of energy (e.g., fuel products) and indirect use (e.g., the higher cost of intermediate inputs that use fuel). The first-best approach to helping firms absorb the impact of higher input prices is to implement the subsidy reform gradually and structurally improve the economy's competitiveness. This can be achieved by improving the business climate, reducing energy dependence, retraining workers who exit industrial sectors that are no longer competitive, and strengthening the financial position and operational performance of state-owned enterprises.

22.   In the long run, subsidy reform is expected to lead to higher and more inclusive growth. Although not all sectors will benefit from subsidy reform, the long-term effects on competitiveness and growth should be positive in the aggregate. By removing distortions in price signals, subsidy reform can help reallocate resources toward their most efficient uses and improve incentives to adopt energy-saving technologies. By reducing domestic energy consumption, higher energy prices should boost hydrocarbon exports and increase hydrocarbon revenues. If the additional fiscal space is used wisely, the growth dividends can be high. Mundaca (2015), examining experiences in MENA, finds that eliminating fuel subsidies ultimately results in higher GDP growth per capita, higher employment, and greater levels of labor force participation, especially among the youth.[11]

Impact on inflation

23.   The impact of subsidy reform on inflation will depend on first- and second-round effects and the policy response. An increase in the price of subsidized products will cause a first-round increase in inflation, with the magnitude of the pass-through dependent on the share of these products in the consumption basket. Food accounts for 43 percent of Algeria's consumer price index, of which bread and cereals represent 11.7 percent, milk and cheese 4.7 percent, cooking oil and fats 2.6 percent, and sugar products 1.5 percent. Transportation and communications account for 15.9 percent of the basket, and housing 9.3 percent. The impact of subsidy reform on inflation will also depend on second-round effects, which are generated by expectations of future inflation and the presence of indexation mechanisms in the economy. In this context, the government should refrain from granting wage increases to compensate for the one-off shock to prices. Monetary policy should accommodate the first-round impact on prices, but should respond to the second-round effects. A prompt policy response would be particularly important in the event that inflation was already on the rise before the implementation of the subsidy reform or that exchange rate depreciation was also happening at the same time.

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[11] A cross-country analysis shows that a 20-cent increase in gasoline and diesel prices per liter is associated with higher GDP-per-capita growth rates by about 0.46 percent and 0.24 percent, respectively.

Subsidy Reform and Domestic Price Inflation[1]
(CPI, year-on-year percent change)

Morocco
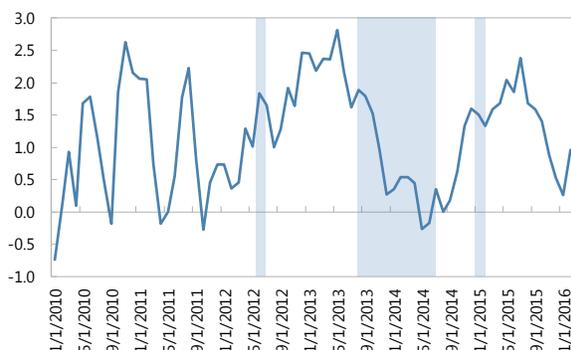
Tunisia
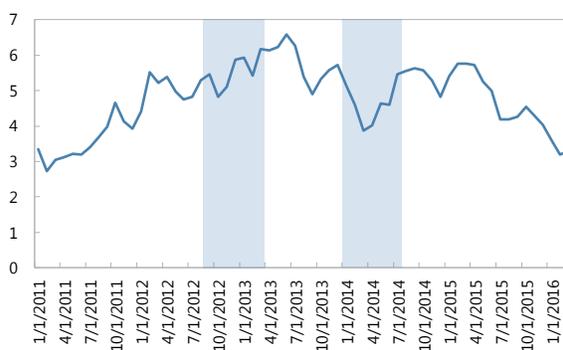
Jordan

Qatar

United Arab Emirates

Iran

Sources: Haver; and IMF staff calculations.
[1] The shaded regions represent the period during which subsidy reforms were implemented.

24.   Cross-country experience suggests that subsidy reforms do not lead to persistently higher inflation, particularly when price increases are gradual and well planned. In Morocco, Tunisia, and Jordan, gradual increases in domestic energy prices did not result in s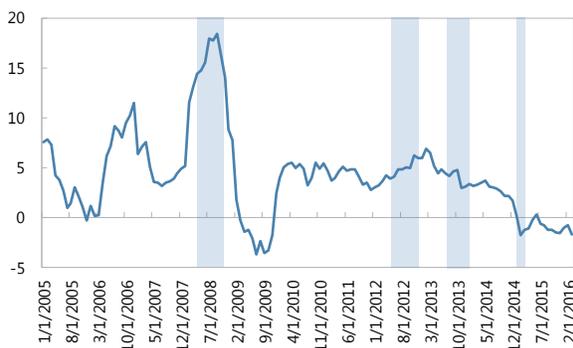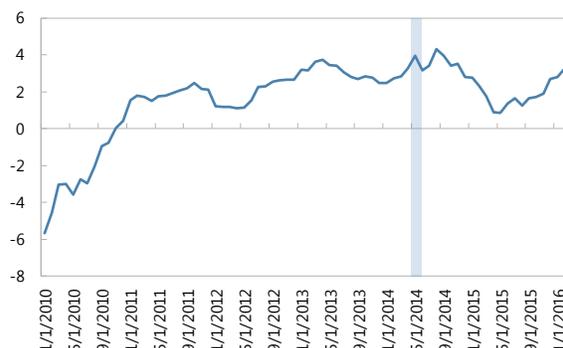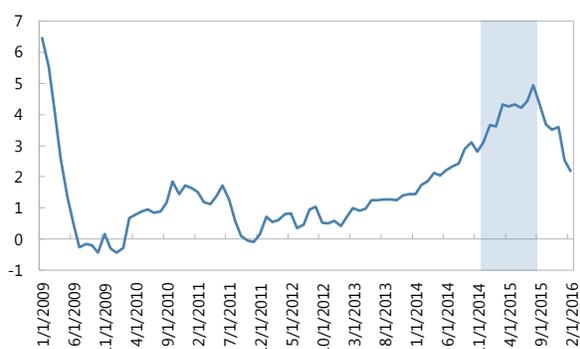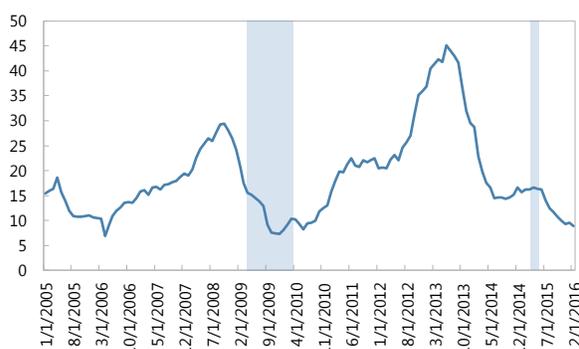ustained increases in inflation. In Qatar and the United Arab Emirates, inflation increased modestly following subsidy reform, but subsequently receded. In the case of Iran, inflation initially remained subdued following the launch of the government's program to phase out subsidies on energy and other products, but ultimately increased significantly, due in part to exchange rate depreciation and large injections of credit by the central bank. Studies assessing the inflationary impact of global energy prices shocks on inflation suggest that the impact is relatively small. For instance, Ghezzi et al (2011) and De Gregorio (2012) estimate that a ten percent increase in global oil prices increases headline inflation by between 0.5 and 1.4 percentage points.

Administered Products	
(Weight in CPI basket)	
Drinking water	0.66
Electricity and gas	2.98
Public sector rents and service charges	1.77
Butane gas	0.91
Gasoline	1.43
Bread	4.38
Durum wheat	3.57
Powdered milk	2.93
Flower	1.62
City transportation	1.49
Rail transportation	0.26
Taxi transportation	1.22
Vegetable oils	1.75
Sugar	1.16
Total	26.13

Source: Algerian authorities.

Impact on poverty and inequality

25.   Although most subsidies in Algeria are regressive, they nevertheless provide support to the poor. Households in the richest quintile spend DA 112,000 per month on subsidized goods while households in the poorest quintile spend DA 81,000. However, as a share of overall household expenditures, the poorest quintile spends more on subsidized goods (24.5 percent) than the richest quintile (13.0 percent). Food products constitute by far the largest category of spending on subsidized goods across all quintiles, with the poorest households spending 17.0 percent of total expenditures on subsidized food and the richest spending 7.7 percent. The next most important category for the poorest is electricity, followed by butane, water, and fuel.

Monthly Household Expenditures on Subsidized Goods, 2011
(Share of total monthly household expenditures)

	Food	Butane	Fuel	Electricity	Water	Total
Quintile 1	17.0	1.6	0.7	3.7	1.5	24.5
Quintile 2	14.8	1.3	0.9	3.2	1.5	21.6
Quintile 3	13.0	0.9	1.3	3.0	1.3	19.5
Quintile 4	11.0	0.8	1.7	2.7	1.2	17.5
Quintile 5	7.7	0.4	1.7	2.3	0.9	13.0
Average	11.2	0.8	1.4	2.7	1.2	17.4

Source: Office National des Statistiques, *Enquête Nationale sur les Dépenses de Consommation et le Niveau de Vie des Ménages, 2010-2011.*

Note: food includes bread, flower, semolina, soy oil, pasteurized milk, and crystalized sugar.

26.   The impact of subsidy reform on poverty and inequality will depend on the magnitude of price increases and the extent of mitigating measures. The immediate impact on poverty of the increase in energy prices prescribed in the 2016 budget law should be minimal. First, the magnitude of the increases is small in dinar terms. Second, as discussed above, spending on fuel and electricity constitutes a small share of overall spending by the poorest households. Since energy products are consumed mostly by the better-off (in absolute terms), the increase in energy prices stands to reduce inequality provided that some of the extra revenues generated are eventually transferred to the poor. Such targeted transfers will be particularly important to offset the impact of

food subsidy reform, given the large share of subsidized food products in the consumption basket of poor households.

F. Conclusion

27.   The Algerian economy is at a critical juncture. The decline in oil prices has precipitated a rapid deterioration in Algeria's fiscal and external position, exposing long-standing vulnerabilities and increasing the urgency for reform. Although Algeria continues to benefit from a substantial cushion of foreign exchange reserves and low debt, recent trends are unsustainable, particularly given the expectation that oil prices will remain low for a protracted period.

28.   Subsidy reform can no longer be delayed. The magnitude of the fiscal adjustment necessary to respond to the oil price shock implies that subsidies cannot be sustained in their current form. In addition to their fiscal cost, subsidies create distortions that are harmful to the economy and the environment while failing to provide efficient support to the poor.

29.   International experience suggests that subsidy reform, if carefully planned and well communicated, can be achieved and lead to long-term benefits. In Algeria as in other oil exporting countries, subsidies are an important element of the social contract and thus subsidies reform requires careful preparation. Algeria should sequence price increases across different products while putting in place a targeted cash transfer program to mitigate the impact of reforms on the poor. Another key ingredient for success is a communications campaign that raises awareness about the cost of subsidies and the benefits of reforms, and helps to generate broad political and public support. When done properly, subsidy reform can lead to greater equity and ultimately higher and more inclusive growth. The government's decision to raise energy prices starting in 2016 was a step in the right direction. The IMF and World Bank stand ready to support Algeria's continued efforts to reform subsidies in the years to come.

Appendix I. Subsidy Reform in the Middle East and North Africa

Country	Reform	Main Mitigating Measures
Oil Importers		
Egypt	2012–13: Prices for 95 octane gasoline increased by 112 percent for high-end vehicles; fuel oil for non-energy-intensive industries increased by 33 percent and for energy-intensive industries by 50 percent. January 2013: Electricity prices for households increased by 16 percent on average; natural gas and fuel oil prices for electricity generation increased by one-third. July 2014: Fuel and natural gas prices increased by 40-80 percent; electricity tariffs increased by 10-50 percent. 2015: Electricity tariffs further increased for large consumers by 10-25 percent.	Electricity tariffs unchanged for the lowest consumption bracket. Some additional social expenditure envisaged in the budget for fiscal year 2015/16 to cover a higher number of beneficiaries of social security pensions.
Jordan	June 2012: Electricity tariffs increased for selected sectors (banks, telecommunications, hotels, mining) and large domestic corporations and households. November 2012: Fuel subsidies eliminated. Fuel prices are now adjusted monthly in line with international price developments. January 2013: Monthly fuel price adjustment mechanism resumed. August 2013 and January 2014: Electricity tariffs increased by 7.5–15 percent for selected consumers. January 2015: Electricity tariffs increased by up to 15 percent for selected consumers. February 2015: Half of the 2015 electricity tariff increase repealed by the authorities. The planned 15 percent increase in tariffs for 2016 has not been implemented (tariff increases were planned at the beginning of 2016 and 2017).	A compensatory cash transfer of US$100 per person is going to families with an income below US$1,130 a month (70 percent of the population) if oil prices are above US$100.
Mauritania	May 2012: New automatic diesel price formula introduced, bringing domestic fuel prices up to international levels. January 2012: Electricity tariffs increased for the service sector. August 2014: Gas prices increased, ranging from 15 to 50 percent. Another price hike is expected end-2014 to remove the gas subsidy.	Gradual reorientation of social safety nets toward well-targeted cash transfer schemes.

Morocco	June 2012: Diesel prices increased by 14 percent, gasoline by 20 percent, and industrial fuel by 27 percent. September 2013: Started implementation of a partial indexation mechanism of certain petroleum products. As a result, diesel prices increased by 8.5 percent, gasoline by 4.8 percent, and fuel oil by 14.2 percent. February 2014: Gasoline and industrial fuel (excluding fuel used for electricity generation) subsidies eliminated; their prices reviewed twice a month. June 2014: Subsidies on industrial fuel used for electricity generation removed. February, April, and July 2014: Per-unit diesel subsidy reduced. The full liberalization of fuel product prices (diesel, gasoline, and kerosene) took place in November 2015. Food subsidies will be gradually reduced in 2016.	Gradual strengthening of existing social safety nets and their targeting to vulnerable groups through improvements in education, health, and assistance to poor widows and the disabled. Support for public transport. Direct transfers to the electricity company to last four years while measures are taken to ensure the financial viability of the company.
Sudan	June 2012: Gasoline, diesel, and liquefied petroleum gas prices increased by 47 percent, 23 percent, and 15 percent, respectively; jet fuel liberalized. September 2013: Diesel prices increased by 74.7 percent, gasoline by 68.0 percent, and liquefied petroleum gas by 66.7 percent.	Public sector wage increase of about SDG100; a monthly grant allocation of SDG150 for about 500,000 urban poor families; lower health insurance premium for about 500,000 poor families; and an exemption of school and transportation fees for disabled people.
Tunisia	September 2012: Gasoline and diesel prices and electricity tariffs increased by 7 percent, on average. March 2013: Further 7–8 percent price increase, on average, for the same products. January 2014: Energy subsidies to cement companies reduced by half and then eliminated in June 2014. Electricity tariff and natural gas prices increased for medium and low-voltage consumers with a 10 percent rate hike in January 2014 and May 2014. July 2014: Gasoline prices increased by 6.4 percent and diesel prices by about 7 percent. 2015: Suspension of programmed increases in fuel prices and electricity tariffs (the latter still heavily subsidized). January 2016: Retail fuel prices reduced by 5 percent. Modification of the fuel price structure through an increase in excises.	Introduction of an additional lifeline electricity tariff for households consuming less than 100 kwh per month. Creation of a new social housing program for needy families. Increase of income tax deduction for the poorest households. Increase and expansion of the cash transfers program for poor families.

Yemen	2011–12: Gasoline prices increased by 66 percent; diesel and kerosene prices doubled. 2013: Diesel price unified across users, including the electricity sector. June 2014: Private sector companies allowed to directly import diesel for their own use at international prices. July-September 2014: Prices of diesel and gasoline increased by 50 percent and 20 percent, respectively. (These are net increases after the partial reversal of a larger adjustment introduced in July.)	Increase in the Social Welfare Fund transfers to the poor by 50 percent in December 2014. Coverage of the Social Welfare Fund (SWF) was expanded to 500,000 additional families.
Oil Exporters		
Bahrain	January 2012: Gas price for old industrial customers increased by 50 percent, from US$1.50 to US$2.25 per mmbtu, while the price for new industrial customers remained at US$2.50 per mmbtu (prices for new customers were increased from US$1.30 to US$2.50 in April 2010). October 2013: Tariffs for electricity and water for non-domestic use also raised. March 2015: Authorities announced annual increases of US$0.25 per mmbtu in the gas price for industrial users starting in April 2015, until the price reaches US$4.0 per mmbtu by April 2021. Authorities also increased the fuel price in marine stations. October 2015: Meat subsidy canceled. January 2016: Regular gasoline prices increased by 56 percent to about US$0.33 per liter; premium gasoline prices increased by 60 percent to about US$0.43 per liter. Price increases for LPG, diesel, and kerosene, electricity, and water to be phased in gradually by 2019.	To compensate for the cancelation of meat subsidies, the government started financial transfers to Bahraini households. Nationals will be exempted from higher water and electricity tariffs on their first house (account).
Iran	May 2015: Fuel prices increased by 40 percent for gasoline and 20 percent for diesel. In addition, gas prices for domestic and commercial use increased by 15 percent.	Most households compensated directly with cash transfers.
Iraq	Iraq embarked on a series of gradual adjustments to historic fuel product prices from 2000 to 2008. The price of LPG increased from 150 to 4000 dinars/cylinder; gasoline from 50 to 450 dinars/liter; kerosene from 5 to 150 dinars/liter; and gas oil from 10 to 400 dinars/liter. There has not been any further price reform for domestic fuel products since October 2008.	
Kuwait	January 2015: Government raised diesel and kerosene prices by 100 percent.	

Oman	January 2016: Gasoline price increased by 23 percent to about US$0.36 per liter.	
Qatar	May 2014: Diesel prices increased by 50 percent.	
Saudi Arabia	December 2015: Authorities announced an increase in fuel prices and reduced electricity and water subsidies. The price of higher-grade gasoline increased from US$0.16 to US$0.24 per liter, while regular gasoline increased from US$0.12 to US$0.20 per liter. Diesel prices increased from US$0.07 to US$0.12 per liter for the transportation sector and US$0.09 per liter for the industrial sector. The prices of methane and ethane gas raised from US$0.75 to US$1.25 and US$1.75 per liter, respectively. Electricity tariffs for households expected to be increased by 35 percent on average.	
United Arab Emirates (UAE)	January 2015: Abu Dhabi increased water (170 percent) and electricity (40 percent) tariffs. August 2015: Fuel subsidies terminated, with pump prices of gasoline and diesel set on the basis of world prices and adjusted automatically every month.	

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THE FINANCIAL STABILITY IMPLICATIONS OF LASTING LOW OIL PRICES FOR ALGERIA[1]

The initial impact of the oil price slump on the banking system has been moderate, but durably low oil prices are likely to increase financial stability risks. In particular, banks face higher liquidity, credit, and interest rate risks arising from linkages with the hydrocarbon and public sectors. These linkages could also increase the vulnerability of the banking sector to systemic risks. Maintaining sound macroeconomic policies, increasing supervisory oversight, and strengthening prudential and crisis management frameworks are key to monitor and prevent the build-up of risks ex-ante, and mitigate them ex-post.

A.   Introduction

1.   This paper discusses the channels through which a prolonged period of low oil prices may affect the banking sector, together with the policies needed to mitigate emerging financial stability risks. The analysis is based on aggregate data only, including bank balance-sheet and supervisory data. Aggregate figures tell a partial picture, and could mask significant disparities in performance, vulnerabilities and potential risks among individual banks. Potential risks at individual bank levels are not covered in this paper.

2.   The Algerian financial sector is dominated by public banks. Financial intermediation remains bank-based, with banking assets representing more than 90 percent of total financial assets on average since 2012. The banking sector is dominated by public banks, which represent 87 percent of total banking assets, while the remaining assets are held by foreign-owned private banks.

3.   Despite the fall in oil prices in late 2014, the banking sector as a whole has remained well capitalized, liquid, and profitable. Supported by robust growth in the nonhydrocarbon sector driven by a high level of public investment, the banking sector remained profitable, with asset quality broadly unchanged and little maturity mismatch. Liquidity buffers have declined markedly, reflecting rapid credit growth and, more recently, the decline in deposits caused by lower hydrocarbon export revenues. Nonetheless, liquidity buffers at the system level remain high compared to other oil-exporting countries in the region.

4.   However, durably low oil prices can negatively affect the banking system through multiple channels. The banking system has strong linkages with the hydrocarbon and public sectors, as public expenditures financed by hydrocarbon revenues remain the main growth engine of the economy: when oil prices are high, large liquidity injections associated with public expenditure reduce bank funding costs and fuel credit growth; and, when the oil price cycle reverts,

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[1] Prepared by Moez Souissi.

hydrocarbon revenues decrease and fiscal deficits widen. Public banks channel most of their lending to the public sector and rely heavily on oil-related public deposits. Private banks primarily focus on corporate banking business that remains highly sensitive to changes in hydrocarbon-driven fiscal spending. These linkages make the banking system vulnerable to oil price fluctuations, which can induce sharp reversals in liquidity and credit conditions due to the economy's insufficient diversification and fiscal policy's dependence on hydrocarbons. On the other hand, the exchange rate channel is muted, as banks are not allowed to lend in foreign currency and a number of exchange controls require exporters to repatriate all export proceeds, with 50 percent converted into local currency.

5.   **The slump in oil prices is likely to increase liquidity, interest rate, and credit risks, including at the systemic level.** In the short term, the excess liquidity that has characterized the banking system under high oil prices will give way to structural refinancing needs, triggering higher funding costs in the banking system and reducing bank profitability. Over the medium term, banks could face liquidity shortages following the weakening of the balance sheets of the public and private sectors, increasing competition for funding and pushing up funding costs in the system. Moreover, the expected economic slowdown resulting from the needed fiscal adjustment could lead to a rapid deterioration in bank asset quality. Furthermore, significant exposures of banks to a concentrated common set of counterparties could lead to synchronized asset quality problems, particularly among public banks. While the expected return of banks to the interbank market will improve the effectiveness of monetary policy transmission mechanisms, it will also increase banks' interconnectedness, potentially opening up new transmission channels of problems in individual banks to the system.

6.   **Prudential frameworks have been recently upgraded but should be strengthened further to increase the resilience of the banking system.** Following the 2013 FSAP recommendations, the central bank has been improving its regulatory and supervisory frameworks toward international standards, which helped limit the build-up of financial stability risks. Further efforts to close gaps in the prudential and crisis management frameworks would help ensure effective ex-ante surveillance and ex-post management of financial stability risks. Crisis preparedness and management should be improved, including by implementing an explicit framework for bank resolution.

7.   **Financial sector policies should support sound and well-calibrated fiscal and monetary policies to minimize unintended financial stability risks.** Macroeconomic policies aim to foster growth and employment, preserve price stability and ensure fiscal sustainability. They also promote financial stability to the extent that they stabilize the operating environment for banks but, as explained below, may have unintended consequences on financial stability. A discussion of the policy mix that best ensures consistency between macroeconomic and financial stability objectives is beyond the scope of the paper, whose focus is limited to the financial sector policies needed to strengthen the resilience of the banking sector, including to possible financial stability risks triggered by macroeconomic policies.

8.   The paper is structured as follows: Section B discusses the performance of the banking sector in 2015. Section C highlights the key macro-financial linkages through which Algerian banks could be affected by the oil price shock, and analyses the potential for financial stability risks reaching systemic proportions if low oil prices were to persist. Section D discusses the adequacy of Algeria's prudential and crisis management frameworks. Section E discusses policy options to strengthen Algeria's capacity to mitigate emerging risks.

B.   Banking Sector Performance in 2015

9.   The use of policy buffers helped mitigate the impact of the oil price shock on the banking sector in 2015. Countercyclical fiscal policy in 2015 contributed to mitigate the impact of lower oil prices on liquidity and credit risks and on bank profitability. Liquidity pressures exerted by lower hydrocarbon export revenues were countered by liquidity injections from large capital expenditures that were mainly financed by drawing on savings in the oil fund. In addition, the high capital spending helped moderate the impact of lower oil prices on nonhydrocarbon activity, and

Capital Spending and Nonhydrocarbon Growth

Sources: Algerian authorities; and IMF staff calculations.

maintain banks' internal capital generation capacity as well as the quality of their loan portfolios.
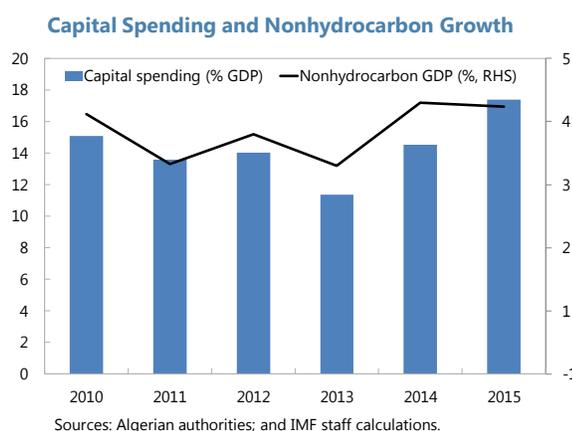
10.   At end 2015, the banking sector as a whole appeared compliant with minimum capital requirements profitable and relatively liquid (Table 1 and Box 1 for a comparative analysis with the GCC).

Table 1. Prudential Indicators for the Algerian Banking Sector (Percent)				
Ratio	2012	2013	2014	2015[1]
Capital adequacy ratio	23.6	21.5	16.0	17.0
Return on assets	1.9	1.7	2.0	2.2
Gross NPL / total loans	11.7	10.6	9.2	9.5
Provisioning coverage ratio	69.8	68.2	65.2	61.4
Net NPL / total loans	3.5	3.4	3.2	3.6
Liquid assets / total assets	45.9	40.5	37.9	27.1
Liquid assets / short-term liabilities	107.5	93.5	82.1	64.0
Source: Algerian authorities' data [1]Preliminary.				

- **On aggregate, the banking sector still has sizeable capital buffers.** The overall capital adequacy ratio improved slightly compared with the prior year-end. Most of the capital held by banks remained of high quality, with Tier 1 capital representing more than 80 percent of total capital on aggregate. In particular, public banks' capital ratios improved from 14.9 percent in 2014 to 16.2 percent in 2015, a result of the capital injections made at some public banks to meet the more stringent minimum capital requirements (for operational risk) introduced at end-2014, and of the government guarantees of large loans extended by some public banks to the public sector. [2]

Capital Adequacy - 2015
(Percent of risk-weighted assets)

Sources: Authorities' data; and IMF staff estimates

- **The banking sector as a whole remained relatively liquid, but deposits contracted.** At end-2015, liquidity buffers remained sizeable at the system level, with liquid assets representing 27 percent of total assets and covering about two-thirds of short-term liabilities on aggregate.[3] However, banking sector liquidity declined markedly in 2015, reflecting continued credit growth and a contraction in bank deposits, notably due to lower hydrocarbon exports. Accordingly, the aggregate loan-to-deposit ratio of public banks rose to 82 percent at end 2015 from 71 percent at end-2014.[4]
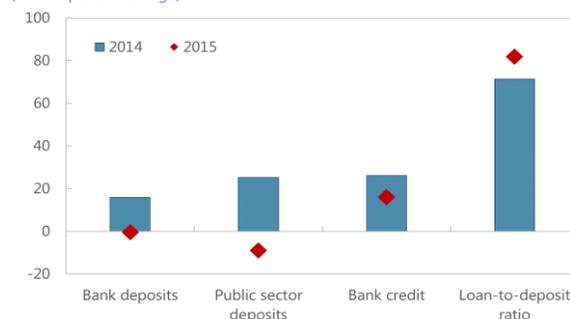
Change in Bank Deposits and Credit, 2014-15
(Annual percent change)

Sources: Authorities' data; and IMF staff estimates

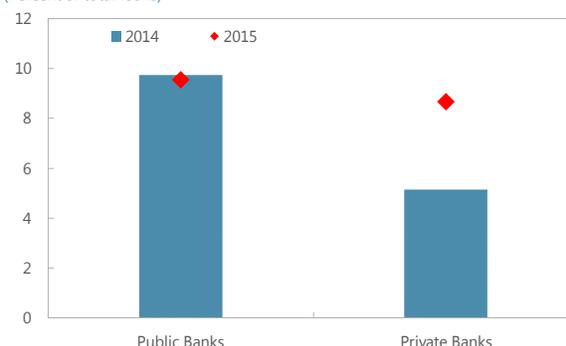[2]See more details on new minimum capital requirements in Section D.

[3] For example, in 2015, liquid assets represented around 26 percent of total bank assets, covering 37 percent of short-term liabilities on average in the Gulf Cooperation Council countries.

[4] Anecdotal evidence suggests that this has resulted in increased competition for funds among banks, putting upward pressures on deposit rates.

- **Credit quality remained broadly unchanged, and stood weaker than in other commodity exporting countries.** Despite the introduction of stricter loan classification rules (see paragraph 26), the overall gross non-performing loans (NPL) ratio remained broadly unchanged at less than 9.5 percent in 2015. The NPL ratio of public banks was 9.6 percent, down slightly from the previous year thanks to an increase in the size of some public banks' loan portfolios. Meanwhile, the overall NPL ratio of private banks increased. The high provisioning levels of non-performing loans (61.4 percent

Gross Non-Performing Loans, 2014-15
(Percent of total loans)

Sources: Authorities' data; and IMF staff calculations

overall) reduced the net NPL ratio to 3.6 percent. Compared with the GCC countries, however, bank asset quality remains weaker while provisioning levels stand lower in Algeria, reflecting looser underwriting standards, particularly at public banks.

11.   The banking system remained profitable, but with mixed performance across banks. On aggregate, bank profitability improved in 2015 and was high by regional standards, as Algerian banks continued to enjoy relatively cheap liquidity and weak competition.[5] In particular, public banks' returns on assets increased from 1.8 percent in 2014 to 2.1 percent in 2015, mainly due to lower provisioning.[6] By contrast, private banks' returns on assets declined from 3.3 percent in 2014 to 3.1 percent in 2015 on aggregate. The weaker profitability was caused in part by a significant drop in income from trade finance activities, following the tightening of prudential rules for these activities, and higher provisioning by private banks. These effects were partially offset by an increase in interest margins as private banks started reorienting their business model towards more private corporate lending.[7]

Average Return-on-Assets and determinants, 2014-15
(Percent)
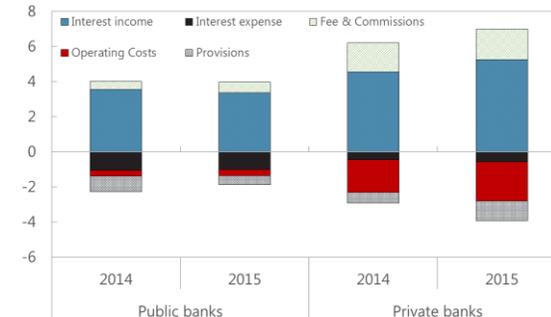
Sources: Authorities' data and IMF staff calculations

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[5] In 2015, the banking system continued to exhibit excess liquidity. In addition, banks continued to refrain from lending to small and medium-sized enterprises (SMEs) beyond directed lending programs, and focused on lending to the corporate sector.

[6] Lower provisioning partly resulted from an increase in explicit government guarantees.

[7] International trade finance activities generated the bulk of private banks' revenues in previous years. However, private banks have been increasingly reorienting their business model towards standard banking following the implementation of stricter prudential standards for trade finance activities (see Instruction 02-2015).

Box 1. Implications of the Oil Price Shock on Financial Stability in GCC Countries

Lower oil prices increase financial stability risks in the GCC through the same transmission channels as in Algeria. Low oil prices lead to system-wide liquidity pressures by reducing export earnings from hydrocarbons. In addition, government deposits represent a significant source of funding for banks, and therefore oil prices can lead to liquidity and funding shocks. Credit risks arise mostly from the indirect impact of oil prices on the macroeconomy as banks have limited credit exposures to oil companies. The major driver of credit risk is the corporate sector while credit risks from retail lending are moderated by limits on debt-to-income ratios, high collateralization through salary transfers and concentration of retail lending in public sector employees who have not been affected by the low oil prices.

**So far, the impact of the drop in oil prices has been mostly felt in domestic and regional financial and capital markets.** Stock markets corrected across the GCC countries, as lack of near-term positive triggers, subdued earnings expectations and uncertain investment climate have kept investors away. Furthermore, Credit Default Swap (CDS) spreads for some countries (Bahrain, Saudi Arabia and UAE) have increased significantly due in part to a drying up of liquidity. The bond market has seen a rise in sovereign issuers as widening fiscal deficits increased financing needs, and tightening liquidity in the banking systems is pushing some banks to begin to tap domestic and regional capital markets. Short-term interbank rates spiked in most countries as liquidity tightened coupled by increasing US rates. Real estate transactions have begun to decline and the prices are softening in the UAE, Kuwait, and Bahrain amid waning demand.

Banking systems remain stable but pressures are emerging. Excess liquidity in the banking system has been declining rapidly as oil related deposit flows into the banking system have slowed and banks have begun to increase reliance on wholesale funding. Private sector credit growth has remained positive but has decelerated sharply across the countries, except in Qatar (related to investments for the 2020 FIFA World Cup). NPLs remain low, but restructured loans have increased in Oman and 'skips' in the SME sector have grown in the UAE. In Bahrain, the ongoing correction in the commercial real estate market has continued to pressure bank asset quality in the wholesale Islamic banking sector. CARs remain high and virtually unchanged in Kuwait, where their marginal decline largely reflects an increase in credit rather than increased provisions for impaired assets.

The policy response has had a mixed impact. Fiscal policy has helped moderate credit risk. The GCC initially maintained public spending, which moderated the impact of low oil prices on non-oil GDP, thereby limiting credit risks. However, the financing of fiscal deficits through drawdown of deposits (UAE) has added to liquidity pressures. In addition, while tightening liquidity-exerted pressures on interbank rates, Bahrain, Kuwait, Saudi Arabia and the UAE increased interest rates in tandem with the increase in the US. Some countries recently took measures to ease the liquidity conditions in the banking system, such as cancelling monthly sales of treasury bills (Qatar), or increasing the loan-to-deposit ratio (Saudi Arabia).

Public Sector Shareholding
(Percent of total assets in the banking system)
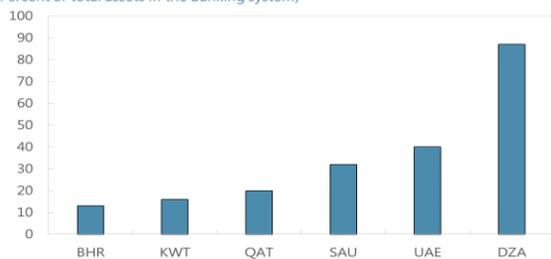
Sources: Country authorities; and IMF staff estimates.

Public Sector Deposits and Credit, 2015
(Percent of total bank deposits and credit)
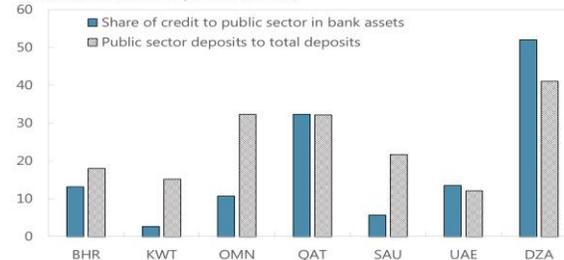
Sources: Country authorities; and IMF staff estimates.

Capital Adequacy Ratio, 2014-15
(Percent)
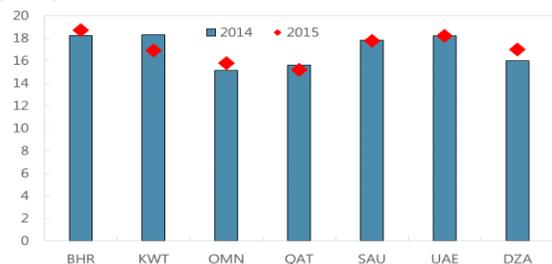
Sources: Country authorities; and IMF staff estimates.

Average Return-on-Asset, 2014-15
(Percent)

Sources: Country authorities; and IMF staff calculations

Gross Non Performing Loans, 2014-15
(Percent of total loans)
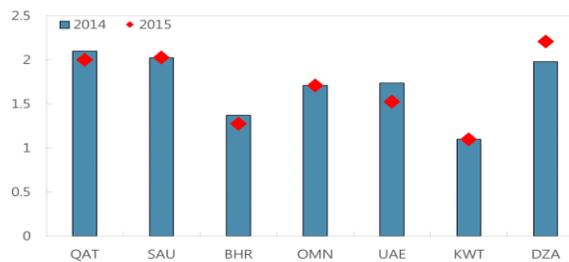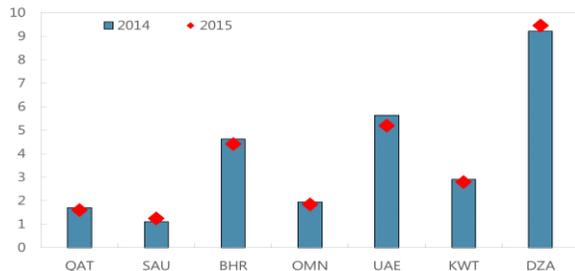

Sources: Country authorities; and IMF staff estimates.

Liquidity Indicators, 2014-15
(Percent)

Sources: Country authorities; and IMF staff estimates.

Stock Markets
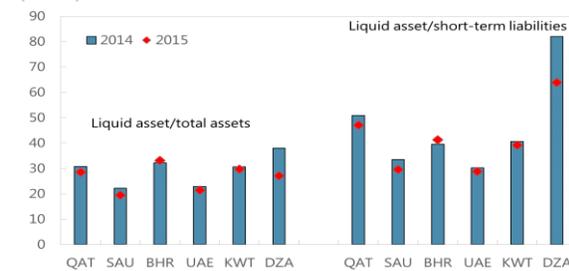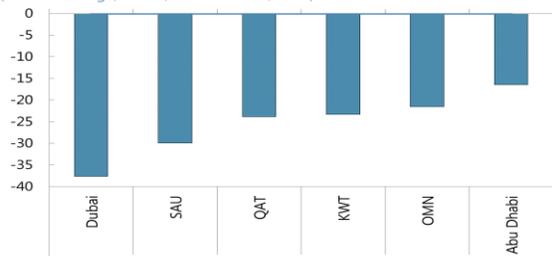(Percent Change, June 1, 2014 - Dec 31, 2015)

Sources: Authorities' data and IMF staff calculations

Interbank Rates
(Percent Change, June 1, 2014 - Dec 31, 2015)

Sources: Authorities' data

C. How Do Sustained Low Oil Prices Increase Banking Stability Risks?

12.   Financial stability risks will rise as the policy space to respond to the oil price shock becomes increasingly constrained. With oil prices projected to remain low over the medium term, the government's capacity to sustain high fiscal spending will become increasingly limited. Consequently, financial stress will increase, and can propagate throughout the banking system via multiple channels.

Oil Share of Exports and Government Revenue, 2010-14
(Percent of GDP)
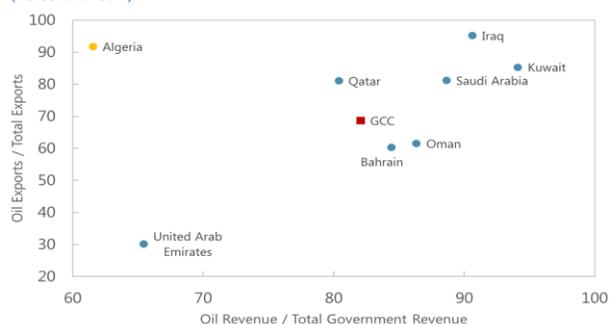
Sources: Country authorities; and IMF staff estimates.

Linkages between the hydrocarbon sector, economic activity, and financial system

13.   Dependence on hydrocarbons represents a key source of macro-financial linkages in Algeria. Like in most MENA oil exporters, hydrocarbons represent the bulk of export receipts and generate a significant share of fiscal revenues. Fluctuations in hydrocarbon prices lead to pro-cyclical fiscal policy and induce a cyclical behavior in bank liquidity and credit. The economy's insufficient diversification and other structural vulnerabilities in the financial system amplify these cycles and increase financial stability risks.

14.   The economy's insufficient diversification makes hydrocarbon-induced liquidity cycles more acute. During price upturns, Algeria experiences windfall gains in export revenues, which translates into a large accumulation of foreign reserves and abundant and cheap liquidity in the banking system.[8] Given the economy's insufficient diversification, a negative oil price shock reduces export revenues almost in proportion to the size of the shock, slowing growth of bank deposits and decreasing system-wide liquidity. For example, during the 1998 trough in oil prices, worsening bank liquidity shortages led to a large central bank liquidity provision, equivalent to about half of banking system credit.

Oil Price and Bank Liquidity in Algeria, 2002-15
(Percent of non-oil GDP)
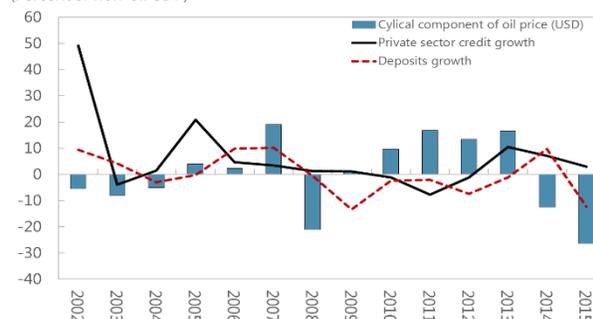
Sources: Authorities' data; and IMF staff estimates.

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[8] By law, hydrocarbon export proceeds must be repatriated and converted into domestic currency.

15.   Algeria's pro-cyclical fiscal policy intensifies hydrocarbon-induced financial cycles.

Public expenditures financed by hydrocarbon revenues remain the main growth engine of the economy. Although an oil stabilization fund was created in 2000, proceeds of hydrocarbon exports have continued to cause pro-cyclical fluctuations in public spending that intensify business and liquidity cycles. Large liquidity injections associated with public expenditure reduce bank funding costs and fuel credit growth. For example, during the recent oil price boom, a surge in capital
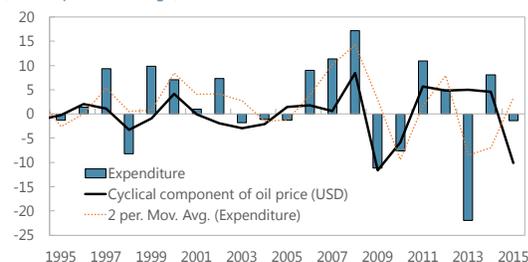
Change in Government Spending and Oil Price, 1991-2015
(Annual percent change)

Sources: Authorities' data; and IMF staff estimates.
Note: Government spending is expressed as a share of GDP. Cyclical component of oil price is calculated from the oil price per barrel in U.S. dollars adjusted for inflation.

and current spending led to a rapid growth in bank credit to the private sector (a cumulative increase of 81.5 percent between 2011 and 2015). However, as the oil price cycle reverts, hydrocarbon revenues decrease and fiscal deficits widen. This leads to fiscal adjustment efforts and, in turn, amplifies the liquidity cycle, slows economic activity, and weakens the balance sheet of the private sector.

16.   Banks' business models also lead to strong links with the hydrocarbon sector. The banking system has strong linkages with the hydrocarbon sector, although subsets of banks have different business models. On the one hand, public banks channel most of their lending to the public sector, and rely heavily on oil-related public deposits.[9] This has led to weak governance and risk management practices. On the other hand, private banks predominantly focus on corporate banking business (both credit and funding), which remains highly sensitive to changes in fiscal spending.

Structure of Public Banks' Deposits and Credit, 2014-15
(Percent)
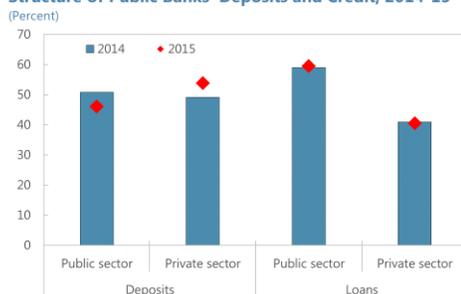
Sources: Authorities' data; and IMF staff estimates.

Structure of Private Banks' Deposits and Credit, 2014-15
(Percent)
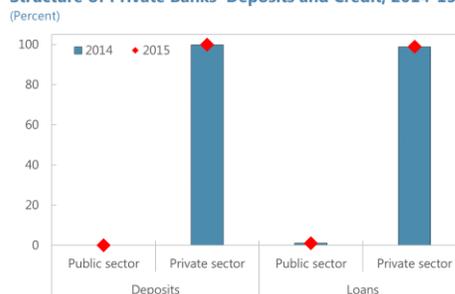
Sources: Authorities 'data; and IMF staff estimates.

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[9] Public banks have been burdened by a legacy of state-directed lending to public enterprises. Moreover, after the collapse of a major local private bank in 2003, the government required public companies to only use public banks. This requirement was lifted in 2007, but little has changed in practice.

Transmission channels of hydrocarbon price shocks to the banking system

17.   Low oil prices impact banking system soundness through a complex web of channels and interactions. Through their impact on system-wide liquidity and macroeconomic performance, low oil prices increase liquidity, interest rate, and credit risks for banks. These channels interact and reinforce each other. The severity of the resulting financial stress depends on the strength, pace, and mix of policy responses to the oil price shock.

Transmission Channels of Protracted Low Oil Prices to the Banking System

18.   The expected immediate impact of the slump in hydrocarbon prices is a reversal in the liquidity cycle. The 2004–14 oil price boom resulted in excess liquidity in the banking system, as reflected by the persistently large bank excess reserves at the Bank of Algeria (BA). Subsequently, the drop in oil prices caused a significant contraction of export earnings from hydrocarbons, resulting in a reversal of the liquidity cycle. Indeed, as noted, banking system liquidity decreased sharply in 2015 despite large liquidity injections driven by the countercyclical surge in public capital spending.

19.   In the short term, liquidity risks would mainly take the form of larger funding costs, which would lead to higher interest rate risks and lower profitability. The expected change from a situation of excess liquidity to structural refinancing needs is likely to trigger a return of

banks to refinancing on the interbank market and/or to central bank lending facilities, inevitably resulting in higher funding costs for the banks. Currently, the rate on the books at which banks can access the BA refinancing facility is 4 percent, which would imply significantly higher funding costs for banks. In particular, public banks, which are likely to be increasingly involved in financing large infrastructure projects, would face weaker profitability, given their limited ability to pass higher funding costs on to their clients.

20.   Over the medium term, funding shortages may emerge for public banks as SOEs'
balance sheets weaken, with possible
spillover effects to private banks. The size
and duration of the negative oil price shock
will further weaken the balance sheets of the
public sector (including the national oil
company). To close possible treasury gaps
and/or finance public investment projects,
SOEs would need to increasingly draw down
their deposits and take on long-term
financing, possibly leading to liquidity
shortages at some public banks, and
increasing funding costs in the banking
system, including for private banks.

Excess Liquidity
(Billions of dinars)
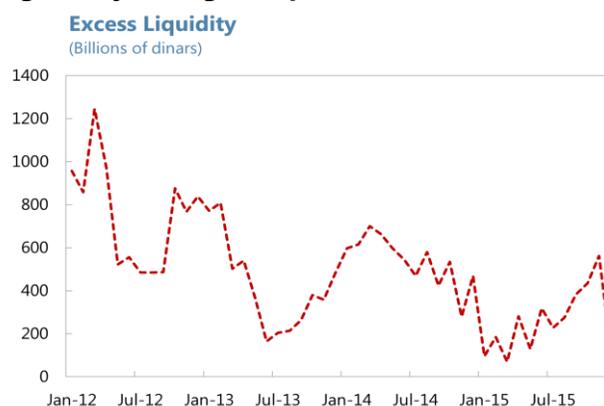
Source: Authorities' data.

21.   Credit risks arise mostly from the indirect impact of lower oil prices on the
macroeconomy. The exposure of banks to the national oil company is limited; thus direct credit risks are minimal. Instead, low oil prices could increase credit risks as the adjustment needed to restore fiscal sustainability will unavoidably weaken growth. Public banks may see their non-performing loans increase due to their significant exposures to a concentrated common set of counterparties in the public sector. This could lead to a synchronized increase in credit risks, reinforcing liquidity strains and heightening the prospects of systemic risk.[10] Private banks will also become increasingly vulnerable to cuts in public spending as they are expected to further increase lending to the private corporate sector. Retail lending, however, should pose limited credit risk in the short term despite the recent lifting of the ban on consumer credit, as the exiting limits on debt to income ratios would help contain growth in household debt.

22.   Policy constraints could intensify financial stability risks. As fiscal and external buffers diminish, the policy space to respond to the oil price shock will become increasingly constrained, and could unintendedly increase the prospects of systemic risk in the medium-term. In particular,

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[10] Concentration risk has been a longstanding structural credit risk, although mitigated over the years by public banks' diversification efforts and tighter regulation of large exposures (see paragraph 28 for more details).

- *Fiscal financing needs will be large and could intensify liquidity strains in the banking system.* To meet increasingly large fiscal financing needs, the government will need to borrow more. Financing fiscal deficits through domestic bond issuance can help develop domestic capital markets and provide banks with alternative high quality investment opportunities in a slowing economy while the zero risk weighting would help improve capital adequacy. However, government domestic borrowing would also exert additional liquidity pressures on banks' balance sheets, intensifying liquidity strains.

- *Crowding out effects could emerge, intensifying the impact of fiscal consolidation on the financial cycle.* Financing the fiscal deficit with domestic borrowing will inevitably cause interest rates to rise, leading to crowding out effects. Crowding out effects can amplify the adverse impact of fiscal consolidation on growth and intensify both credit and liquidity risks. Financing the fiscal deficit partly through external borrowing would help alleviate liquidity pressures on banks and attenuate crowding out effects.

- *Possible monetary policy tightening in response to inflationary pressures could also amplify financial stability risks.* Inflationary pressures may emerge from weaker currency, increases in administered energy prices, and rapid growth in consumer credit. The monetary policy response could then lead to a further tightening in liquidity conditions and intensify the contraction in aggregate demand, amplifying liquidity and credit risks.

- Furthermore*, the BA can face challenges in handling the transition from excess liquidity to structural refinancing needs.* To facilitate the transition from a liquidity absorbing to a liquidity-providing framework, the BA took a number of steps to strengthen its liquidity forecast and management capacity, including the daily production of its balance sheet to improve the monitoring of liquidity developments at the system level. However, the insufficient development of a well-functioning interbank market could pose challenges during the transition. Currently, the interbank market is highly segmented, with private and public banks rarely trading with each other, reflecting the legacy of a private bank failure in 2005. Also, it currently offers no long-term funding, depriving banks of a means of mitigating maturity mismatches and interest rate risks.

23.   While low oil prices affect public banks through similar channels, some individual banks may be more adversely affected than others, and potentially increase systemic risks. Aggregate data can mask disparities across banks with regards to liquidity and asset quality. Some public banks may be systemically important due to their large share in banking activities (credit and/or deposits) or their role in financing large SOEs and public investment projects. Continued deterioration in individual large banks' liquidity and/or asset quality could potentially trigger confidence effects that might affect other sound banks. The expected deepening of the interbank market resulting from increasing bank refinancing needs would open up channels for such confidence effects to spread through the system.

24.   The exchange rate channel is muted. Algerian banks are not allowed to lend in foreign currency, while a number of exchange controls require exporters to repatriate all export proceeds, with 50 percent converted into local currency. Therefore, exchange rate fluctuations have a

negligible impact, as banks can only have small open FX positions, and indirect effects are muted given the limited nonhydrocarbon export sector.

25.   Banking system stress can adversely affect macroeconomic performance, mainly through the fiscal channel. The weak corporate governance of the large public banks could result in substantial recapitalization needs from the government. However, the still relatively low financial intermediation would reduce the impact of feedbacks from the banking sector to the economy through the credit channel.

D.   Can Current Prudential and Crisis Management Frameworks Mitigate Rising Financial Stability Risks?

Adequacy of prudential frameworks

26.   The BA has upgraded its regulatory and supervisory framework toward international standards, which has improved the resilience of the banking system.

- *New regulations on capital adequacy.* In 2014, new solvency requirements have integrated a substantial part of the standard approach of Basel II. In addition, in line with Basel III, the solvency ratio has been elevated to 9.5 percent, consisting of a 7 percent minimum requirement in Tier 1 capital, and a capital conservation buffer of 2.5 percent. Nevertheless, the large capital buffers of public banks could be affected by a zero-risk weight being applied to exposures to SOEs that benefit from a state guarantee; at end-2015, lending to SOEs represented close to 60 percent of public banks' total loan book (excluding government bonds).

- *More stringent limits on concentration risk and classification and provisioning rules*. In 2014, the BA also tightened existing large exposure requirements by reducing the threshold of the aggregate large exposure, defined as the sum of large individual exposures exceeding 10 percent of regulatory capital (the threshold was previously 15 percent), to 8 (from 10) times the regulatory capital. In addition, loan classification requirements were expanded to cover the treatment of overdraft and restructured loans.

- *Minimum liquidity requirements were introduced in line with Basel standards*. In 2014, the BA strengthened its liquidity regulation. It introduced a number of liquidity instruments that aim to reduce risk-taking behaviors, including the minimum liquidity ratio that requires banks to hold highly liquid assets to meet short-term obligations, and the transformation ratio that limits the ratio of long-term liabilities to long-term assets. However, the new Basel III net stable funding ratio (NSFR) has not been implemented yet.

- *Risk-based supervision.* The BA adopted a risk-based supervisory framework in 2013, and is currently rolling out its CAMELS-based bank risk rating methodology to cover all banks. However, the outcomes of the risk rating system are not yet fully incorporated in the analysis of the offsite supervision. Moreover, ratings are still based on a standalone assessment without taking into consideration factors related to consolidated supervision.

27.   However, liquidity requirements can have unintended procyclical effects and therefore intensify the financial cycle. Algeria's minimum liquidity requirements are more stringent than the Basel III liquidity standards. Furthermore, they are time invariant, and could lead to intensified competition for funds among banks when system liquidity dries up, putting upward pressure on funding costs. Should credit risks increase, they could even cause liquidity hoarding by banks due to higher uncertainty about counterparty risk, amplifying systemic liquidity risk.

28.   Also, gaps in the credit risk management framework remain. The Gaps include low coverage of credit registries, remaining weaknesses in loan classification and provisions, and inadequacies in the insolvency regimes and corporate governance.

- *The existing corporate sector central credit register has been recently upgraded, but its coverage remains low.* The BA has adopted a detailed modernization plan to overhaul the existing credit registry, including by expanding its coverage to individuals. However, the publicly operated system may not provide banks with sufficient information to conduct a comprehensive credit risk assessment or conduct monitoring, as it suffers from limited coverage, insufficient data quality, and limited historical track record.

Credit Bureau/Registry Coverage
(Percent)
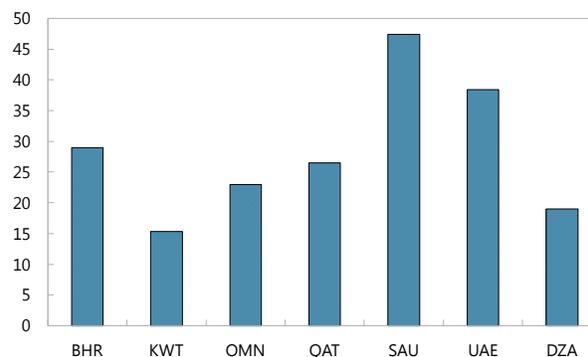
Sources: World Bank Doing Business (2016); and IMF staff calculations

- *Loan classification and provisions could be tightened further.* Public banks, some of which are systemic, have weak governance practices, and existing banking law and regulations lack specifics on bank governance requirements. In addition, the government-mandated credit policies further weaken underwriting standards and supervisory oversight. As a result, the NPL ratio, designed to help monitor credit risks, likely understates the degree of asset impairment while also overstating bank profitability and CAR.[11]

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[11] Currently, banks are not required to classify as non-performing an impaired loan that carries a government guarantee.

- *Upgrading the insolvency regime would help improve debt recovery of impaired loans.* While
Algeria ranks better than other MENA
oil exporters with respect to banks'
recovery rate and the number of years it
takes to recover, it continues to rank
low with respect to the insolvency
regime. The collateral regime remains
weak and can impede the recovery
process, particularly during stress
periods. The securities law is weakened
by barriers to the proper
implementation of guarantees owing, in
particular, to registries scattered across
the nation and the existence of stalling

Resolving Insolvency-Key Indicators

Sources: World Bank Doing Business (2016); and IMF staff calculations

tactics that allows debtors to evade some of their obligations. This causes banks to concentrate
on mortgage collateral (the least likely to lose value in the long term) and neglect other forms
that are nonetheless authorized by the legal framework (IMF, 2014a).
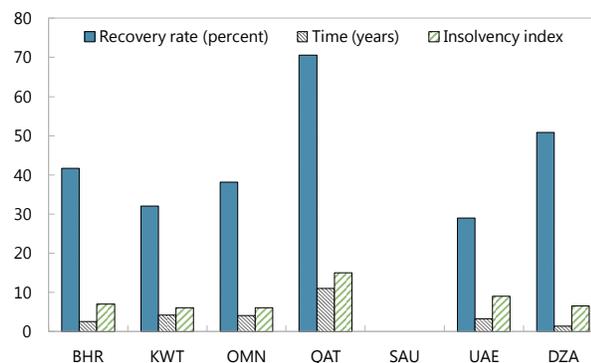
29.   **Furthermore, insufficient compliance of the banking sector with disclosure obligations
undermines market discipline.** Of note is the failure to publish consolidated statements and
intermediate results as well as the lax obligations requiring publication of qualitative information on
institutional exposures to risk. Moreover, the annual reports of public banks are not generally
available on their websites, forcing the public to seek the information from legal notice systems.

30.   **In the absence of a market for long-term funding, maturity mismatches and exposure
to interest rate risk can increase**. Banks' funding comprises very few, if any, issuances of
marketable longer-term bonds. Some banks have advanced asset and liability management (ALM)
methods based on computing run-off rates for their interbank-corporate term as well as retail
deposits, and adjust their asset maturity accordingly. This ALM framework facilitates banks'
monitoring of their interest rate risk and the pricing of their balance sheet. Other banks, however,
have less control over the maturity of their assets because of specific public missions, and may face
in the future important ALM mismatches and interest rate exposures in the absence of access to
long-term funding.

31.   **Macroprudential policy can play an important preventative role in mitigating systemic
risk.** Fiscal policy is the main policy tool for managing the links between oil prices, the domestic
economy, and the financial sector, given that government spending is the main transmission
channel. Nevertheless, the exposure to oil price volatility and the associated macro-financial
feedback loops outlined in the previous sections suggest the need for a systematic and
countercyclical approach to macroprudential policies—including as a result of the unintended
financial stability implications that fiscal policy can have, as explained above. A comprehensive and
established macroprudential policy framework is essential to using some prudential instruments in a
countercyclical way, taking into consideration the interactions and feedback loops between

economic and financial conditions. In particular, countercyclical macroprudential policy can prove useful to reduce the buildup of systemic risks in the financial sector during upswings, and to cushion against disruption to financial services during periods of financial sector stress (Box 2).

32.   However, there is no formal use of macroprudential tools to address systemic risks in Algeria. The BA has taken several steps toward introducing a financial stability framework, including by creating a financial stability committee (FSC) responsible for the macroprudential oversight of the financial system. However, the institutional framework for macroprudential policy remains weak due to the lack of clarity on the precise objectives, roles and responsibilities of FSC. In addition, systemic risk assessment capacity is limited as most macro-financial surveillance at the BA focuses on macroeconomic variables and the outcomes of banking supervision, due to limited data quality, availability, and coverage. Furthermore, there is no formal macroprudential toolkit that could be deployed to prevent *ex ante* the build-up of vulnerabilities, and mitigate *ex post* the risks.[12]

Box 2. Countercyclical Macroprudential Policies—International Experience

Macroprudential instruments are typically introduced with the objective of reducing systemic risk, either over time or across institutions and markets. Countries use a variety of tools, including credit-related, liquidity-related, and capital-related measures to address such risks, and the choice of instruments generally depends on countries' degree of economic and financial development, exchange rate regime, and vulnerability to certain shocks. Countries often combine the use of these instruments to complement other macroeconomic policies, and adjust them countercyclically so that they act in much the same way as "automatic stabilizers."

Macroprudential instruments can be classified according to the financial risks they target, and can be adjusted over time to enhance resilience and contain emerging risks. Broad-based macroprudential tools include countercyclical capital buffers (CCBs), dynamic loan loss provision requirements, and the leverage ratio. These measures build resilience in banks by affecting all the credit exposures of the banking system and the cost of capital (IMFb, 2014). On the other hand, household sector vulnerabilities can be contained through a range of sectoral tools that target specific credit categories such as sectoral capital requirements (risk weights), loan-to-value and debt-service-to-income ratios.

The countercyclical use of macroprudential policies across commodity exporting countries is becoming more common. In many cases, macroprudential policy instruments such as liquidity tools have been implemented in a countercyclical way only after the global financial crisis. . In Azerbaijan, the liquid-asset ratio is adjusted based on liquidity indicators and stability of funding, while reserve requirements are adjusted based on the credit-to-GDP gap. In Canada, the calibration of the liquidity requirements incorporates considerations of liquidity, stability of funding, market risk premia, and systemic risks. Peru, which was concerned with foreign currency exposures owing to volatile capital flows, has introduced high reserve requirements on foreign currency liabilities of banks. These reserve requirements have been eased recently with the impending normalization of U.S. monetary policy.

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[12] Banks monitor loan-to-value (LTV) and debt-to-income ratios (DTI), which has helped limit credit growth, but the existing regulation does not impose explicit limits for these ratios.

Box 2. Countercyclical Macroprudential Policies—International Experience (concluded)

Macroprudential Tools in Use in the Region

	Broad-based tools					Sectoral Tools				Liquidity Tools			Other Tools	
	Counter-Cyclical Capital Buffers	Leverage Ratio	Dynamic Provisioning	Capital Surchages on SIFIs	Sectoral Capital Requirements	Concentration Limit	Loan-to-Value Ratio	Debt-to-Income Caps	Reserve Requirements[1]	Loan-to-Deposit Ratio	Liquidity Requirements	Sectoral Capital Buffers	Interbank Exposure Limits	Open FX Position Limit
GCC														
Bahrain	*	*				*		*	*		*		*	
Kuwait						*	*	*			*	*	*	
Oman						*	*		*	*	*		*	
Saudi Arabia	*	*	*			*	*	*	*	*	*			
United Arab Emirates						*	*	*	*	*	*		*	*
Non-GCC MENA														
Algeria		*				*	*	*			*			*
Yemen		*	*			*			*		*			*
Jordan		*				*	*				*			*
Lebanon						*	*		*		*		*	*
CCA														
Azerbaijan		*				*			*		*			*
Kazakhstan			*			*		*	*		*			*
Armenia				*		*			*		*		*	*
Georgia	*				*	*			*		*			*
Kyrgyzstan														

Source: IMF Global Macroprudential Policy Instruments Database, 2013.
1/ Reserve requirements other than for central bank monetary operations.

Preliminary evidence based on these international experiences points to the effectiveness of macroprudential policies in reducing systemic risks, in particular during upswings. Macroprudential policies are being increasingly used in emerging markets, especially since the global financial crisis. Given that these policies have only recently been introduced, the evidence on their use and effectiveness is still evolving. They are found to be effective in dampening procyclicality and therefore the buildup of systemic risk (e.g., Lim and others (2011) and Cerutti et al (2015)). Loosening measures seem to have smaller effects than tightening as they may not lead to an expansion of credit if demand is weak (e.g., McDonald, 2015).

The effectiveness of time-varying liquidity requirements to contain systemic liquidity risk requires further analysis. Most prudential liquidity requirements, including the traditional short-term asset to short-term liability ratio or the more recently introduced Basel III liquidity ratios, are predominantly micro-prudential in nature as they focus on the idiosyncratic run risk at individual financial institutions and, as such, may not act as a circuit-breaker in a systemic liquidity spiral. Many, including the European Systemic Risk Board, have discussed the idea of a time-varying liquidity requirements (ESRB, 2014), and there have been other proposals, such as liquidity risk charges and macroprudential liquidity buffers (Perotti and Suarez (2009), Milne (2010) and Hardy and Hochreiter (2014)). Also, countries have taken ad hoc action to relieve systemic liquidity pressures during crises, for example by relaxing reserve requirements. But, there is little empirical work that has been done on the effectiveness of such measures.

Multiple early warning indicators are needed to assess the evolving nature of systemic risk and the need for tightening or relaxing macroprudential measures. Early warning indicators can help signal when policy adjustments are appropriate, and support clear communication of policy intentions (IMF, 2014). A gradual implementation of macroprudential policy actions is often appropriate as there may be uncertainty about the transmission to the real economy and it is important not to over-tighten.

In the MENA region, some progress in managing systemic risks has been made with the introduction of macro prudential tools (Callen et al, 2015). The GCC has made greater use of macroprudential tools while progress in the other countries has been slower. However, a number of challenges remain, even in the countries that have employed the tools. In all these countries, there is a need to build the institutional framework for formulating and implementing macroprudential policy. Although most GCC countries have systemically important banks, capital surcharges needed to address risks from systemically important financial institutions (SIFIs) have been applied by only a few countries. In some countries (Bahrain), the debt-to-income ratio has not effectively contained household indebtedness because of leakages to non-bank financial institutions. Islamic finance has grown to systemic importance in the GCC but macroprudential policies have not yet been adapted to cater to the specifics of risks from the sector.

Adequacy of crisis preparedness and management framework

33.   Algeria's financial sector still does not have an adequate crisis management framework. There is currently no single body that considers the financial system as a whole, nor is there a contingency manual describing responsibilities and tasks of the involved agencies in times of crisis. Coordination between the various authorities involved continues to be mostly informal. The responsibilities of each authority are not clearly defined in such situations, and cooperation agreements have yet to be developed in this regard.

34.   The BA has appropriately introduced a regulation defining a framework for longer-term refinancing facilities, i.e., the discount operations and outright loans. In times of crisis, banks' emergency liquidity needs would be met through these facilities as regular monetary policy instruments, such as open market operations, would become off limits to distressed banks due to the lack of collateral resulting from the limited issuance of government and private-sector marketable debt instruments. These longer-term refinancing facilities, introduced in July 2015, could satisfy liquidity needs of individual banks in amounts and maturities that are not under direct control of the central bank. For example, discount operations can be provided on the basis of a wider range of collateral than open market operations, with haircuts varying with the quality of the collateral and maturities up to six months, renewable up to three years.

35.   Clarification of an emergency liquidity assistance (ELA) framework is needed. To manage market expectations concerning the potential availability of these facilities, thereby reducing moral hazard, discount window and outright loan facilities should be part of a broader emergency liquidity assistance framework. The framework should clearly refer to the exceptional basis of these facilities and to the explicit discretion of the BA to decide on individual requests on a case-by-case basis. It should also adequately price access to these facilities to avoid excessive recourse by banks

36.   The legal instruments for bank resolution currently at the disposal of the authorities constrain the scope of preventive actions. The resolution powers of the Banking Commission are not well defined, there is no special resolution regime for banks, and the range of available resolution options is limited. Bank failures in Algeria are handled under the general insolvency framework, leading to a process fraught with difficulties. In the event of a bankruptcy, the choice is between liquidating the entire bank (the *de facto* preferred model for private bank failures) and public-sector support. Once a bank's license is revoked, a liquidator is appointed, which in practice has been painstakingly slow and disruptive to both debtors and creditors (e.g., all debts fall due upon liquidation, which renders the process severely disruptive for borrowers).

E.   Conclusions and Policy Recommendations

37.   Policy priorities should include enhancing risk assessment and monitoring. In the immediate term, stress testing of liquidity and credit risks should be conducted regularly. Liquidity monitoring should be intensified and high frequency data on deposit trends should be analyzed for signs of stress. There is also a need to align loan classification and provisioning with best practices

so that NPLs can provide an accurate status of asset impairment. To ensure a more proactive assessment of bank risks, the BA should accelerate the integration of its risk rating system in the supervisory approach and inspection methodology.

38. **Rather than subsidizing public banks through the acquisition of bad loans, it would be more transparent for the banks to write off losses that have been fully provisioned for and be recapitalized when needed.** The most common form of public sector bank recapitalization has been through the purchase of nonperforming claims by the Treasury. This releases the provisions that were set aside and leads to a commensurate increase in capital. Instead, it would be more transparent to write off the NPLs, and to recapitalize the public banks only if needed. This would establish better incentives for banks to undertake more diligent loan underwriting and monitoring.

39. **A systemic risk framework and a comprehensive macroprudential toolkit are key for effective surveillance and management of systemic risk.** Priorities include:

- *Improving data quality, closing data gaps, and developing analytical tools for systemic risk assessment.* Despite improvements in the quality of the data and more stringent reporting requirements from the BA, further efforts to improve the quality and granularity of bank data are required.[13] In addition, an integrated risk assessment framework should be introduced to allow the systematic mapping of financial stability risks to a macroprudential toolkit. Some dimensions relevant to Algeria could include: macroeconomic variables, hydrocarbon sector, liquidity, asset quality, common and large exposures, and risks from large public banks.

- *Implementing gradually a comprehensive macroprudential toolkit to address systemic risk.* Existing prudential tools do not explicitly address systemic risk with respect to the time or structural dimensions. Time-varying liquidity and reserve requirements and dynamic provisioning could be envisaged.[14] The BA could also consider introducing explicit LTV and DTI limits.

40. **Improving corporate governance of public banks and modernizing the bankruptcy and collateral frameworks are also needed.** Existing banking law and regulations remain broad on bank governance requirements, and hence, need to be amended to introduce detailed provisions on the matter. In addition, Algeria's insolvency law lacks provisions for effective debt recovery. The scope of the law should be broadened; insolvency practitioner regulation is scarce; and there are no cross-border insolvency provisions. Moreover, there is no law for the personal bankruptcy of

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[13] Key data gaps that need to be filled include: household balance sheets (household debt, loan-to-value and debt-to-income ratios), corporate balance sheets (e.g. debt and debt service coverage ratios), and characteristics of bank loan portfolios.

[14] The macroprudential instruments would first require an improvement in data quality and analytical tools. Also, varying reserve requirements (RR) should not be considered as a constant tool to help banks comply with the liquidity ratio. Otherwise, it could cause moral hazard risks. Therefore, micro prudential supervision should be enforced. Furthermore, because RR are also a monetary instrument to steer credit and inflation, their usage should also take into consideration the factors of monetary policy and business cycle.

consumers, something that will be needed now that the restrictions relating to consumer credit have been lifted, increasing the likelihood of bankruptcies. Finally, strengthening the quality, information, and notice function of the collateral registries will ultimately reduce banks' risk.

41.   To improve crisis preparedness and management, and given the challenges faced in earlier bank liquidation, an explicit framework for bank resolution should be prepared. The deficiencies in the resolution framework could hamper the effectiveness of preventive actions against a problem bank. A separate bank resolution framework exempting banks from the corporate insolvency framework would allow for continuity of essential functions, while facilitating market-based solutions, such as a rapid transfer of all or part of a failed institution's business.

42.   Finally, taking active steps towards interbank market development can increase bank resilience to emerging risks. The BA should continue its efforts to mop up excess liquidity until neutral liquidity conditions are achieved. As liquidity conditions tighten, thereby creating the need for interbank transactions, banks will start establishing credit limits and credit lines for unsecured transactions and the secured market would start developing. In addition, the "broker" role played by the BA could be used to activate the secured market and bridge market segmentation. Revitalizing the interbank market could include authorizing direct dealing among banks and setting up a legal framework for interbank repurchase operations (repos). Interbank repos help minimize counter-party risk and increase the demand for treasury paper.

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