

How do resource-driven economies cope with the oil price slump? A comparative survey of ten major oil-exporting countries

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The oil price slump of about 50% since 2014 has had a detrimental effect on oil-exporting emerging market economies (EMEs), potentially threatening to trigger social unrest in countries that had benefited from the oil price boom for more than a decade. We provide a first descriptive account of the policy reactions of central banks and governments of eight important oil-exporting EMEs and compare them with those of two oil-exporting advanced economies, allowing us to distinguish three patterns: One group of countries has so far successfully defended its exchange rate peg to the U.S. dollar, the reference invoicing currency (Saudi Arabia and the United Arab Emirates). A second group gave up resistance to mounting market pressures and carried out step devaluations or switched to a floating exchange rate (Russia, Kazakhstan, Azerbaijan, Nigeria and Angola). A third group of countries continued to let their currencies float (Mexico, Canada and Norway), with the stable long-term relationship between the exchange rate and commodity export prices qualifying these currencies as “commodity currencies.” We conclude that EMEs featuring peg-like regimes and saddled with limited structural diversification, modest fiscal and external buffers as well as weak institutional conditions for capital controls are unlikely to be able to uphold their exchange rate choices if they suffer a major and sustained adverse terms-of-trade shock, and should opt for flexibility sooner rather than later. While declining oil prices may imply a degree of passive diversification, a proactive long-term strategy to develop a more diversified economic structure in good times could at least partly reduce the need for buffers.

JEL classification: Q43, O13

Keywords: oil price shock, emerging market economies, oil-exporting countries, oil currencies, interest rates, exchange rates, macroeconomic fluctuation

Notwithstanding their importance in the global economy, oil prices are fairly volatile. The oil price slump of 2014–16 was very strong and has persisted so far.² Without looking at spikes, the average Brent oil price (in U.S. dollars) almost halved in the first half of 2015 compared to the same period of 2014 and then shrank again by about one-quarter in the first nine months of 2016 against the respective period of 2015. This article takes stock of the impact of the oil price shock about two years into the weak oil price environment and assesses how resource-rich economies have reacted to this unexpected and sustained deterioration of their terms of trade. Particularly, we want to know whether these reactions follow distinct patterns dependent on structural features of the respective economies.

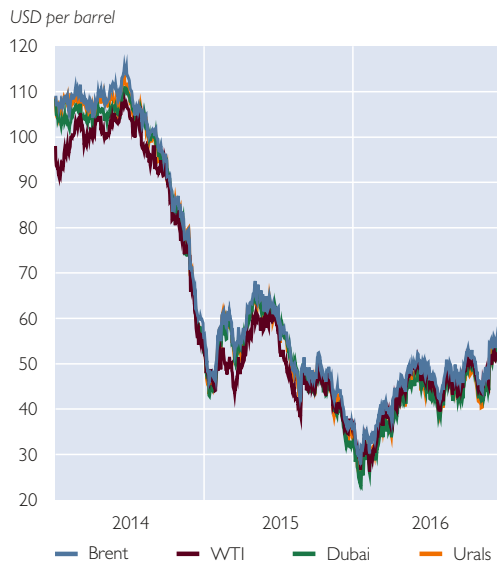
The powerful oil price slump sharply reduced oil exporters’ revenues (in U.S. dollars), given low elasticity of demand for oil, and thus negatively affected a typical oil-exporting country’s trade, current and capital account balances; it also caused a large terms-of-trade shock. Oil-related fiscal revenues, which usually constitute an important part of such a nation’s budget, plummeted. Exporting companies’ and state revenue losses and their negative knock-on effects on domestic demand

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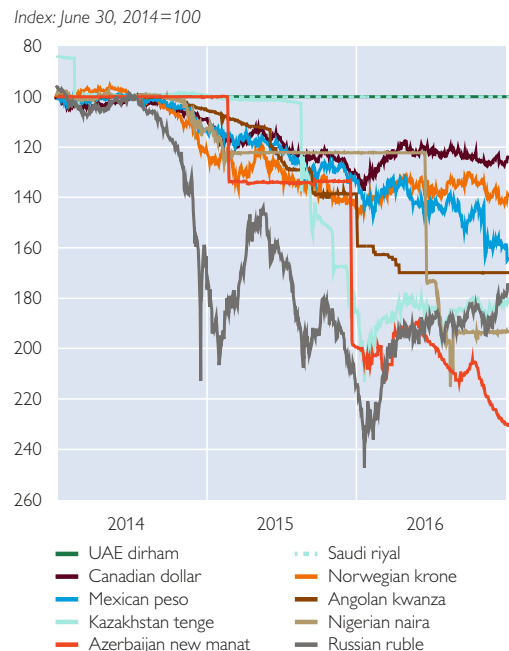
² The cutoff date for the data in this study is December 15, 2016.

Crude oil price and exchange rate movements

Crude oil prices



Exchange rates against the U.S. dollar



Source: Thomson Reuters.

may well weaken overall economic growth, which may in turn impinge on the quality of bank loans and on banks' profitability.

An oil-exporting country's weakening external and fiscal positions could possibly lead to twin (current account and budget) deficits, which is very likely to put pressure on the country's currency. The extent of this pressure depends on a variety of factors: whether current account and budget balances are already in deficit before the oil price plunge, how large the country's external debt is, how high its international reserves are, whether the country possesses oil stabilization funds (OSFs) or sovereign wealth funds (SWFs), how large these OSFs or SWFs are, to what degree the country's financial system is dollarized, and whether the authorities can, or actually do, apply or tighten exchange controls effectively, at least for a certain time. Finally, the elasticity of the oil supply-side reaction of the relevant economy also weighs in: While low oil prices decrease incentives to extract resources, countries that depend heavily on oil revenues or that pursue strategies to gain market shares may even feel compelled to raise output despite falling oil prices. This supply-side reaction may of course be influenced by the prospect of re-establishing an effective international oil supply cartel.

The value added of this study lies in the systematic and detailed comparison of experiences of ten important but diverse resource-driven economies. To our knowledge, such an examination is unprecedented because it is based on updated information and analytical reflection. Accordingly, we look at how these economies use external, monetary, fiscal, financial, and structural policies to adjust to the oil price slump.

The article is structured as follows: In section 1, we provide an overview of the principal dimensions and considerations of the adjustment process. Section 2 provides

the rationale for our choice of examined countries. Section 3 empirically describes and compares the impact of the oil price slump and the crisis-response policy reactions of the examined countries.³ We summarize our findings and draw some preliminary analytical conclusions in section 3.

1 General considerations and key dimensions of the adjustment process

Faced with deteriorating terms of trade, oil-exporting countries have three sets of options for an exchange rate regime response:

If the oil-exporting country decides to *uphold a fixed or stable exchange rate*, typically pegged to the U.S. dollar (given that oil and other raw materials are mostly invoiced in this currency), plummeting oil revenues will likely cause a strong deterioration of the current account⁴ and may also lead to capital outflows (triggered by weaker economic prospects for the country and scaled-down oil industry investment plans).⁵ Loan portfolios of the oil sector obviously become vulnerable to an oil price decline. Leaving aside capital controls, if current and financial accounts deteriorate substantially, possibly alongside eroding confidence, the central bank will need to intervene in the foreign exchange market and thus draw down international reserves, which will shrink in nominal terms and as a ratio to GDP. An increase of the key interest rate, while procyclical, could also help stem outflows.

The longer the oil price remains at a relatively low level, the more international reserves and OSFs may erode.⁶ This erosion may contribute to intermittent market instability and a loss of confidence, with some market players possibly tempted to test the peg arrangement. Exchange rate pegs may not be suitable if the reserve buffer is not sufficiently large. In a situation of medium or longer-term loss of oil-related budget proceeds, procyclical fiscal consolidation appears all but unavoidable to preserve budgetary sustainability, rein in current account shortfalls, avoid an undue expansion of external debt, and support exchange rate pegs (Sommer et al., 2016, p. 29). This consolidation would arguably be best achieved through spending cuts because oil-exporting countries' budgetary expenditures had in many cases increased significantly during the period of high oil prices; if necessary, an effort could also be made to increase non-oil revenues. By reining in domestic demand, fiscal consolidation could cushion the loss of international reserves. The oil price shock, combined with budget austerity (fiscal drag), will probably slow down growth, which can have a negative impact on banking activity. Banks' balance sheets may also suffer to the extent that the quality of oil sector

³ For a comparative analysis of the crisis-response policies of Russia, Ukraine, Kazakhstan and Belarus during the previous oil price shock (2008/09), see Barisitz et al. (2010).

⁴ The current account will deteriorate because oil-related revenues decline while the price of imports expressed in local currency remains unchanged (given the fixed exchange rate). Thus, the fixed exchange rate prevents any price-related contractionary effects on imports.

⁵ Of course, the government can react to the balance of payment problems and take up debt abroad to smooth the impact of the oil price shock, which would correspond to policy-induced capital inflows in reaction to the crisis-triggered external deterioration and likely private capital outflows.

⁶ The amount of erosion also depends on the nominal flexibility of wages and prices over time and thus on the extent to which downward rigidities are effective in an economy, which, in turn, typically depends on structural and institutional characteristics. The majority of economies, whether oil exporting or not, feature relatively high downward rigidities and a slow pass-through, which suggests that in most cases, a strategy of internal devaluation (based on the above-mentioned nominal flexibility) is unlikely to promise rapid adaptation.

loans deteriorates. Where applicable, austerity could be avoided or postponed by divesting (some) government holdings of corporate assets, which suggests that privatization receipts could serve as a temporary source for financing increased fiscal shortfalls.

A totally different response would be to opt for fiscal stimulus to counteract the negative impact of the oil price slump on the business cycle. Such a stimulus could be financed by drawing on SWF assets. However, assuming an extended oil price slump, this strategy would appear risky and feasible at best in the short term, unless the country in question possessed very large buffers. In any case, a fiscal stimulus would likely imply the deterioration of external and fiscal positions and accelerated drawdowns of public assets and reserves. Ultimately, asset depletion would force the fiscal authorities either to take recourse to (further) accumulation of debt or, if fiscal space is lacking, to change course and pursue procyclical (unpopular) policies.

Over the longer term, the buildup of other export-oriented branches (apart from the oil sector) would appear key to reducing the economy's vulnerability to oil price changes and would help diversify the economy. Substantial investments in other branches (e.g. agriculture, manufacturing, tourism) of course take time and would need to be financed, e.g. by the country's SWF, if one is available. Luckily, the cost competitiveness of such export-oriented branches improves as real depreciation triggered by lower crude oil prices causes Dutch disease phenomena to evaporate. To support new export-oriented branches, business conditions would need to be rendered as favorable as possible to attract strategic investors. Improving the quality of institutions and of governance can go quite a way to help diversify the economy.

In contrast, opting for a *flexibilization of the exchange rate* and allowing the currency to slide may have some advantages for oil-exporting countries, but it is also risky and has side effects. It would be important or at least very helpful for robust monetary policy frameworks and sufficiently developed foreign exchange markets to be in place to mitigate potential risks (Danforth et al., 2016, p. 4). A solid framework would facilitate a sound move to inflation targeting or targeting of monetary aggregates. While an inadequately managed liberalization of the exchange rate could destabilize markets and in the worst case set in motion an inflation-depreciation spiral, a step devaluation (or pegging to a new stable rate) could generate expectations and market pressures in favor of further devaluations (Horton et al., 2016, p. 14). In both cases capital flight may ensue. In this transitional situation, boosting interest rates may be (temporarily) helpful to stabilize expectations. In any case, the pass-through from devaluation-triggered rising import prices (see below) produces an inflationary spurt that requires the monetary authority's particular attention to forestall second-round inflationary effects.

Disregarding short-term stability issues, the result of a devaluation or depreciation is that the value of oil exports (mostly invoiced in U.S. dollars) increases if measured in domestic currency.⁷ The value of non-oil exports (e.g. manufactured goods)

⁷ *The result of the combined effect of the oil price drop and the exchange rate slide on the domestic currency value of oil exports can, of course, cause the domestic price of oil to stay unchanged or go either up or down. Therefore, depending on the amount of depreciation or devaluation and on the size of the oil price reduction, the profitability of oil producers and exporters may even rise.*

may remain unchanged in the devalued domestic currency, but will fall if expressed in foreign currency, which boosts these goods' competitiveness. While the U.S. dollar value of imports is not affected, their domestic currency price increases, which makes them less affordable in the oil-exporting country and reduces demand for imports there. The value of remittances transferred by guest workers in the oil-exporting country to their home countries shrinks unless these home countries also devalue against the U.S. dollar.

Thus, the impact of the oil price decline on the current account is cushioned by the decline of the domestic currency's external value. While over time, the depreciation preserves or enhances competitiveness, this is not typically a smooth process.⁸ A successful devaluation may be conducive to export diversification or import substitution strategies, although the improvement of price competitiveness as such is not sufficient to bring about aimed-for structural adjustment. Also, even a large depreciation is likely to exert only a limited effect on the competitiveness of an oil-exporting country and its capacity to balance its external accounts if the share of its non-oil and non-resource sectors (whose competitiveness would benefit from the depreciation) in GDP is very low. Moreover, such exporting or import-competing industries may be reliant on imported inputs.

Monetary authorities that opt for a flexible exchange rate do not (systematically) support the domestic currency by intervening in the foreign exchange markets, thus providing much-needed protection for the country's international reserves (Sommer et al., 2016, p. 13). International reserves, expressed as a ratio to GDP, may even increase in the event of a devaluation, but this also goes for external debt.

Moreover, a devaluation can cushion the fiscal impact of an oil price decline: While oil-related budget revenues, if expressed in U.S. dollars, decrease, this decrease is (partly) offset by the exchange rate adjustment (Esters et al., p. 6). OSFs (largely consisting of foreign exchange-denominated assets) suffer from dwindling or drying-up transfers, but, if measured in domestic currency, receive a devaluation-triggered boost. To judge the entire budgetary impact, one also needs to look at how expenditure dynamics react to the devaluation: The fiscal impact of the oil price decline can be more easily absorbed if expenditures are not, or barely, raised in the face of the depreciation-triggered higher inflation. Ultimately, devaluation may not suffice to rectify the fiscal position: Additional consolidation measures will probably be necessary, which may also help rein in inflation.

Not only weaker economic conditions, but also devaluation may have a negative impact on bank balance sheets and lending in economies that are strongly dollarized (i.e. that have high shares of foreign exchange-denominated deposits and loans in total deposits and loans). Apart from entailing possible currency mismatches, the domestic currency's loss of value automatically increases the share of foreign exchange-denominated credits in the total credit volume. An increased debt burden (expressed in domestic currency) renders debt service more difficult for unhedged foreign currency borrowers. This, in turn, may raise the nonperforming loan (NPL) ratio, which increases financial risks, reduces incentives for credit

⁸ *Initially, the J-curve effect slightly increases the external disequilibrium further before it contracts. The exchange rate pass-through to inflation may be small or large, and it also needs to work its way through the price system. Finally, monetary policy needs to prevent second-round effects.*

institutions to expand lending, and negatively impacts on banks' profitability. In some cases, high dollarization can be an important argument in favor of stabilizing the exchange rate (Horton et al., 2016, p. 2).

Finally, if the oil-exporting country already manages a *flexible exchange rate regime*, it faces less pressing adjustment needs, at least in the short run, because its currency would tend to fluctuate in line with the dollar price of oil, classifying such a country's currency as a commodity currency. Thus, in domestic currency terms, the reduction of oil revenues would be mitigated. Similarly, the economy as a whole should become more competitive, which would principally allow other sectors' export gains to compensate for the losses in oil revenue. Still, given the imperfection of the pass-through from oil prices to the exchange rate (and limited amounts of reserves or funds), some fiscal adjustment may be needed to avoid external and internal imbalances from arising in the form of twin deficits (current account and public households). And, as is the case with exchange rate peggers – albeit to a lesser extent – these fiscal policies would have to be procyclical, resulting in sluggish growth. However, the improved competitiveness of other exporting and import-competing industries through the improved nominal and real effective exchange rate will finally help revive economic activity gradually. Over time, the economy will become more diversified and thus more resilient.

2 Countries under examination

Workman (2016) provides a list of the countries that exported the highest U.S. dollar value of crude oil in 2015:

Country	USD billion	% of global crude oil exports
1. Saudi Arabia	133.3	17.0
2. Russia	86.2	11.0
3. Iraq	52.2	6.6
4. United Arab Emirates	51.2	6.5
5. Canada	50.2	6.4
6. Nigeria	38.0	4.8
7. Kuwait	34.1	4.3
8. Angola	32.6	4.1
9. Venezuela	27.8	3.5
10. Kazakhstan	26.2	3.3
11. Norway	25.7	3.3
12. Iran	20.5	2.6
13. Mexico	18.8	2.4
14. Oman	17.4	2.2
15. United Kingdom	16.0	2.0
16. Azerbaijan	13.0	1.7

From the above list, we excluded countries that are net oil importers (U.K.), countries with fewer than 5 million inhabitants (Kuwait: 4.2 million, Oman: 4.5 million), civil war countries (Iraq), countries that have been the subject of extensive oil investment-related and oil export-related sanctions (Iran), and countries with excessive delays in the completion of IMF Article IV consultations and whose data may therefore be insufficient or difficult to compare (Venezuela: no Article IV consultation since 2004).

We thus examine and compare crisis-response policies in the following ten countries:⁹

Middle East:	Saudi Arabia, United Arab Emirates (U.A.E.)
CIS:	Russia, Kazakhstan, Azerbaijan
Africa:	Nigeria, Angola
Latin America:	Mexico
Advanced economies:	Canada, Norway

3 Crisis-response policies: a comparative survey

In this section, we will briefly describe and compare the ten selected countries' actual policy reactions to the oil price slump. Here we distinguish five fields: exchange rate and monetary policy (which is our principal focus), financial and banking policy, fiscal policy, structural and institutional policies, and (if applicable) recourse to external finance/assistance.¹⁰ IMF staff reports for Article IV consultations (or comparable surveillance exercises) served as a general source of information on these policy reactions and measures. As outlined above, exchange rate strategies can be principally divided into three types: first, retaining an existing exchange rate peg; second, repegging or performing step devaluations and/or making the exchange rate regime more flexible; third, keeping an existing exchange rate float. Step devaluations and movements toward floating exchange rates are considered together because in most cases, repegging does not lead to a new stable state: Typically, it invites new (downward) market pressure on the exchange rate. To defend a repegged exchange rate and limit the erosion of foreign currency reserves, countries might opt to introduce capital controls. Yet, pressures can become so strong that the repegged rate is abandoned and the currency is floated.

3.1 Retaining a peg

Among our observed countries, Saudi Arabia and the United Arab Emirates (U.A.E.) have chosen to stick to their fixed exchange rates. Both have managed conventional pegs to the U.S. dollar for decades (Saudi Arabia since 1986, the U.A.E. since 1997). While both countries featured average annual economic growth rates of 4% to 5% in the years before the oil price started to slide in the second half of 2014, in 2015 and 2016 respective rates declined to 2% to 3% (table 1). Both countries also enjoyed very high twin (current account and budget) surpluses in the years prior to the crisis, but then Saudi Arabia became saddled with high twin deficits and the U.A.E. recorded budget shortfalls while maintaining low current account surpluses (for the time being). Even if financing burgeoning deficits and defending exchange rate pegs has reduced the two players' international reserves and oil stabilization or similar funds substantially (in the U.A.E. only from 2015), these resources remain generous.¹¹ Shortfalls have partly been financed by boosting external debt.

⁹ Detailed tables with key economic data on the examined countries can be made available by the authors upon request.

¹⁰ A detailed outline (in the form of a comparative table) of the examined countries' policy reactions to the oil price plunge can be made available by the authors upon request.

¹¹ As a case in point, the combined net foreign assets and government deposits with the Saudi Arabian central bank declined from USD 1,119 billion (150% of Saudi Arabian GDP) in 2013 to an (estimated) USD 797 billion (123% of GDP) in 2016.

Both countries initially countered the oil price plunge-triggered economic weakening by implementing fiscal stimuli (in 2014 and early 2015), but soon spending was reined in again and fiscal consolidation policies gained the upper hand. For instance, capital expenditures were sharply curtailed. Notwithstanding this policy reversal, budget balances turned red, as mentioned above, and wage arrears ballooned (Schmid, 2016). The countries therefore took further austerity measures, e.g. introducing a 5% value added tax, cutting benefits for state employees, and trimming salaries of cabinet ministers and members of parliament by 15% to 20%. In an attempt to reduce market pressure on the Saudi Arabian riyal, in the first half of 2016 the Saudi Arabian Monetary Authority (SAMA), the country's central bank, banned credit institutions from selling options on riyal forwards and outlawed the use of derivatives to speculate against the riyal. To support banks, the Saudi Arabian authorities in January 2016 established a deposit insurance fund, and in September announced the injection of 20 billion riyals (USD 5.3 billion) into credit institutions in the form of time deposits. In a further attempt to boost liquidity, SAMA introduced various repo agreements.

To diversify growth away from overdependence on oil, both countries have set out broad structural reform initiatives, called “Vision 2030” (Saudi Arabia), and “Vision 2021” (U.A.E.). The Saudi Arabian authorities are also moving ahead with privatization plans, which even include the proposed sale of a stake in Saudi Aramco, the largest oil-producing company in the world (Gehlen, 2016). Moreover, both countries have taken recourse to external borrowing: In the first international debt issuance since 1991, Saudi Arabia in April 2016 agreed to a USD 10 billion five-year loan from a group of U.S., European and Asian banks. In the same month, the U.A.E. issued a USD 5 billion Eurobond.

3.2 Performing step devaluations or making exchange rate regimes more flexible

In reaction to the oil price slide as from 2014, five of the countries studied here – Russia, Kazakhstan, Azerbaijan, Nigeria and Angola – initially repegged their currencies or widened existing exchange rate corridors around central parities within the framework of managed exchange rate regimes. Four of these countries eventually opted to float their currencies, with Azerbaijan opting for a managed float. The fifth country, Angola, still tightly manages the kwanza, its legal tender. While Russia witnessed average pre-crisis (2012 to 2014) economic growth of 2% a year, Kazakhstan and Azerbaijan featured rates of around 4%, and Nigeria and Angola boasted even higher rates of (officially recorded) growth of 5% to 6% a year, as table 1 shows. All five countries fell into recession or economic stagnation in 2015/16. Russia's GDP fell most strongly (2015: –3.7%), but Russia's recession may have bottomed out in late 2016. The remaining countries saw their growth rates decline but remain positive in 2015 and then dip into negative territory (Kazakhstan, Azerbaijan, Nigeria) or stagnate (Angola) in 2016 (The Economist, 2016).

Unlike the two Arab countries that have maintained their pegs, the countries that devalued their currency or made their exchange rates more flexible have experienced higher inflation, at least temporarily. The devaluations had an immediate balance sheet impact on external debt, which in most cases rose by about 10 percentage points of GDP (table 1). The dollarization ratio of banks' deposits and

loans also grew automatically. Coupled with the economic slowdown or recession, the higher dollarization ratio contributed to driving up NPL ratios in most of the countries. On the other hand, the CIS countries Russia and Azerbaijan and the two African countries have not seen their current accounts worsen. Fiscal balances have been more difficult to get under control, even if budgets have by no means suffered from devaluations. Increased competitiveness or other benefits of repeggings or adjustments of exchange rate regimes have allowed international reserves to recover or at least not erode further. In Russia and Kazakhstan, international reserves have even attained pre-crisis levels. OSFs and SWFs have reacted in a largely similar manner, with the exception of Russia's budgetary Reserve Fund, which is expected to become exhausted at end-2017 (based on an oil price of USD 40 per barrel). The country's National Wealth Fund still has assets of about 6% of annual GDP.

3.2.1 The CIS 3 (Russia, Kazakhstan, Azerbaijan)

Russia was the first of the five repegging or exchange rate corridor-widening countries to move to a more flexible exchange rate regime, and it did so swiftly.¹² Following a few steps of further widening the ruble's exchange rate corridor, the Central Bank of Russia (CBR) floated the Russian currency on November 10, 2014, and introduced an inflation targeting regime, adopting the overnight repo rate as key interest rate.¹³ In mid-December 2014, the CBR raised its key rate by 6.5 percentage points to 17% to stave off financial stability risks and to respond to the worsening inflation outlook. The CBR also expanded its liquidity facilities for commercial banks. At the turn of 2014 to 2015, the government adopted an anti-crisis plan, introducing a Capital Support Program for banks (about 2% of GDP) financed by the federal budget through the sale of bonds (*Obligatsii federalnogo zaima – OFZs*) (Barisitz, 2015, p. 77). From end-January 2015, the monetary authority unwound the December 2014 emergency key rate hike, reducing this rate step by step to 10% in September 2016. From the floating of the ruble to end-September 2016, the Russian currency depreciated by about 40% against the U.S. dollar. CPI inflation, after swelling to 15.3% at end-June 2015, receded to 5.8% at end-November 2016.

After carrying out a step devaluation of 18% in 2014, the National Bank of Kazakhstan (NBK, the Kazakh central bank) in July 2015 widened the trading band for its currency, the tenge, and on August 20 of that year introduced a floating exchange rate regime (see table 2), which initially triggered a plunge of the tenge. Subsequently, the overnight repo rate was introduced as the key interest rate, and

¹² Nevertheless, the exchange rate decision could have been taken earlier, given that the Russian debate on moving to a flexible exchange rate and inflation target had already started years before (on the initiative of the IMF). The final decision occurred on top of already mounting market pressures and proved more costly than if it had been taken a few months before

¹³ From September 2014, Western sanctions linked to the Ukrainian crisis have restricted Russian firms' and banks' access to Western capital markets. Russia's countersanctions – an agricultural embargo imposed on sanctioning countries – have contributed to fueling Russian inflation in the short term and to stimulating domestic farming production in the medium term. According to expert assessments, the impact of the sanctions and countersanctions on the Russian economy has been minor, compared to that of the oil price collapse (Gurvich and Prilepskiy, 2015, p. 384; see also IMF, 2016, p. 4–5).

an inflation targeting regime was announced (similar to the setup in Russia).¹⁴ Overall, from mid-2014 to end-August 2016, the Kazakh currency lost about half of its external value against the U.S. dollar. To stem rising inflation (January 2016: 14.4% year on year) and financial sector instability, the NBK raised the key rate to 17% in early February 2016; moreover, administrative controls were imposed on food prices. Rate cuts from May to November 2016 (to 12.0%) followed to support the ailing economy, and inflation has been receding to stand at 8.7% year on year at end-November.

After repegging the Azerbaijani currency's exchange rate in February 2015, the Central Bank of Azerbaijan (CBA) carried out another step devaluation of the manat in December 2015 (both devaluations totaled 58% against the U.S. dollar) and adopted a managed floating exchange rate regime.¹⁵ Thus, although the manat's exchange rate has become more flexible, foreign currency market interventions have continued to be frequent. The inflation rate rose from a very low level to 7.7% at end-2015. In the second half of 2015, the government established a bad bank, a special-purpose vehicle to collect and manage the NPLs of the largest state-owned banks. In an effort to avert a currency and banking crisis (given rising deposit outflows and swelling bad loans),¹⁶ the CBA raised the key rate to 5% in early 2016 and imposed capital controls, including a surcharge of 20% on specific foreign exchange purchases. Although the monetary authority granted credit institutions regulatory forbearance (e.g. with respect to restructuring loans), the licenses of eight undercapitalized banks were revoked in February 2016. An action plan was drafted to restructure the remaining ailing banks. The legislature also approved a law to fully insure household bank deposits. Meanwhile, to stem continuing depreciation cum inflation pressures, the CBA's policy rate was hiked step by step to 15% in September 2016.

In the fiscal sphere, the Russian government has not delivered a stimulus, but carried out budgetary consolidation measures; still, deficits expanded and were largely covered by the Reserve Fund, which added to liquidity provision for the economy. The Kazakh authorities opted for a three-to-five-year economic support package in 2014 ("Nurly Zhol," Bright Path), involving public investment programs (envisaging total spending of USD 19 billion) supported by multilateral development banks. In 2015, this substantial effort was, however, cut back and partly replaced by fiscal consolidation measures (Madani and Sarsenov, 2016, p. 9). In the turbulent year of 2016, the Azerbaijani government made an effort to provide a small fiscal stimulus focusing on wage and pension increases and raising targeted social assistance.

The Russian authorities plan to privatize stakes in some important raw material-extracting enterprises and banks (including the country's biggest oil

¹⁴ See also Dąbrowski (2015, p. 10). The decline of the tenge was also influenced by China's economic slowdown and by Russia's recession, which weakened external demand. Furthermore, the preceding float and sharp depreciation of the ruble increased the competitiveness of Russian consumer goods in Kazakh markets in the framework of the Eurasian Economic Union (both Russia and Kazakhstan are members).

¹⁵ Apart from plummeting oil prices, the growth slowdown in Russia and other neighboring countries as well as currency movements had contributed to heightened pressure on the manat.

¹⁶ The deposit outflows were due to weak confidence in the (depreciating) domestic currency, and the bad loans stemmed from some high concentrations of lending to the embattled oil sector and to unhedged foreign currency borrowers.

company, Rosneft, and its second-biggest bank, Vneshtorgbank), largely to support budget finance. As of December 2016, 11% of the diamond extractor Alrosa had been privatized for USD 815 million, and a 19.5% stake of the oil producer Rosneft had been sold to a consortium of Glencore and the Qatar Oil Fund for USD 11.0 billion. On two occasions, in May and September 2016, Russia also tapped the Eurobond market, borrowing a total of USD 3 billion. The Kazakh authorities announced in November 2015 that they planned to partially privatize up to 70 Kazakh companies (including the big oil and gas extractor KazMunayGas) in the 2016 to 2020 period. The government of Azerbaijan has launched the “2020 Development Strategy” with the goal of re-establishing sustainable growth, diversifying the economy toward agriculture and tourism, and improving the business climate. The Transcaucasian country has also made a request for financial assistance to the IMF (Håring et al., 2016, p. 1).

3.2.2 The African two (Nigeria, Angola)

Both Nigeria and Angola manage multiple exchange rate systems and dispose of various other administrative constraints on access to foreign exchange. With the oil price plunge, both countries experienced a dramatic decline in economic growth. Despite two step devaluations (in November 2014 and in February 2015 by a total of 30% against the U.S. dollar) and the above-mentioned exchange controls, the Nigerian authorities were not successful in stemming the decline in foreign exchange reserves, prompting them to impose additional restrictions (on commercial banks’ currency trading) in early 2016.¹⁷ Meanwhile, banks’ loan portfolios suffered among other things from the oil price decline, as they are concentrated in the hydrocarbon sector. With pressure on the naira, the national currency, continuing, the authorities finally decided to float the naira (table 2) on June 20, 2016, while maintaining capital controls. Subsequently, the currency plummeted. To support the currency and to combat quickly rising inflation, the Central Bank of Nigeria (CBN) raised its policy rate from 12% to 14% one month after floating the currency. In August 2016, the CBN moved to suspend the activities of nine banks that did not meet their prudential ratios in terms of liquidity, bad loans or capital. As of November 2016, despite a 50% slide of the naira since its float in June, extensive foreign currency shortages continued to keep the gap between official and unofficial exchange rates wide. CPI inflation (year on year) reached 18.3% in October 2016.

Angola devalued the kwanza twice in 2015 (in June and September, by a total of 31% against the U.S. dollar), supported the currency with its international reserves, and added an additional exchange restriction (a priority list for certain economic sectors for access to foreign exchange). However, the Angolan foreign exchange market remained in disequilibrium, with spreads between official and parallel rates widening substantially, prompting the Banco Nacional de Angola (BNA) to resort to another step devaluation (of 15%) in January 2016. Despite restrictions, inflation doubled to 14% at end-2015 and then almost tripled to 40% in October 2016 (year on year). With the economic slowdown and the weakening

¹⁷ In recent years, Nigeria’s oil industry has suffered not only from the oil price decline, but also from continued militant and terrorist attacks on infrastructure, particularly pipelines. These attacks have added to economic stress and have contributed to depressing the country’s crude oil production (Klare, 2016, p. 12; Tétart, 2016, p. 17).

Table 1

Key macroeconomic and financial data: pre-crisis (2012–14) v. crisis period (2015–16)¹

	GDP growth		CPI inflation		Gross international reserves		Budget balance	
	%		Year-end, %		Year-end, % of GDP		% of GDP	
	Pre-crisis	Crisis	Pre-crisis	Crisis	Pre-crisis	Crisis	Pre-crisis	Crisis
Angola	5.6	1.5	8.1	31.2	25.1	23.0	-0.8	-5.2
Azerbaijan	3.6	-0.7	1.6	10.3	18.3	4.7	1.8	-8.4
Canada	2.1	1.5	1.4	1.3	4.0	5.1 ⁵	-2.1	-2.3
Kazakhstan	4.8	0.2	6.1	11.2	13.0	15.3 ⁵	-2.5	-2.1
Mexico	2.5	2.3	4.0	2.8	14.5	15.4 ⁵	-4.0	-3.6
Nigeria	5.3	0.5	9.3	14.1	7.9	4.9	-1.1	-4.0
Norway	2.0	1.3	1.6	2.5	11.5	15.1 ⁵	10.8	4.3
Russia	1.8	-2.2	8.2	9.2	22.3	28.6	-0.6	-3.7
Saudi Arabia	3.9	2.4	3.0	3.1	93.5	89.2	4.8	-14.5
United Arab Emirates	5.0	3.2	1.4	3.9	16.5	25.4 ⁵	8.8	-3.0

	Current account balance		External debt		Dollarization		NPL ratio	
	% of GDP		Year-end, % of GDP		FX share in total loans, %		%	
	Pre-crisis	Crisis	Pre-crisis	Crisis	Pre-crisis	Crisis	Pre-crisis	Crisis
Angola ²	5.3	-7.0	22.7	38.3 ⁵	42.6	35.4 ⁵	9.4	18.2 ⁶
Azerbaijan ³	17.4	0.2	14.6	29.4	17.3	59.3	4.9	17.3 ⁵
Canada	-3.0	-3.5	85.5	111.4	28.2	33.4 ⁵	0.6	0.5 ⁵
Kazakhstan	1.2	-3.0	70.2	94.7	27.7	..	28.3	..
Mexico	-2.0	-2.8	30.9	34.3 ⁶	11.4	13.3 ⁵	2.9	2.9 ⁶
Nigeria	2.8	-2.0	1.6	2.6	22.8 ⁷	..	3.1	2.5 ⁶
Norway	11.5	7.3	..	155.5 ⁵	1.6	1.1 ⁵
Russia	2.6	3.3	31.2	38.6	14.5	23.6 ⁵	6.2	9.0
Saudi Arabia	16.8	-7.4	0.0	1.6	10.7	8.9 ⁵	1.4	1.2 ⁵
United Arab Emirates ⁴	16.6	2.2	43.9	60.2	18.9	21.4	6.2 ⁷	5.3

Source: IMF and authors' calculations.

¹ While regarding 2014 (as a whole) as a pre-crisis year and 2015 as a crisis year is certainly imprecise because the oil price slump already started in the fall of 2014 and accelerated in December 2014, this simplified distinction between pre-crisis and crisis periods is applied for statistical reasons. The 2016 data that were used to calculate the average values for the 2015–16 crisis period either reflect the latest available figures or the latest IMF forecasts for 2016. All other figures are based on annual averages.

² External debt: external public debt; dollarization: share of FX deposits in total deposits, %.

³ Dollarization: share of FX deposits in broad money, %.

⁴ Dollarization: share of FX deposits in total deposits, %.

⁵ 2015.

⁶ Mid-2015.

⁷ 2013–14.

of the kwanza, financial soundness indicators have deteriorated and the BNA has requested undercapitalized banks to submit recapitalization plans.

In the fiscal sphere, Nigeria first tightened the budgetary stance in 2015 in reaction to the oil price shock, then made an effort to provide a small fiscal stimulus in 2016. Angola appears to have followed a consolidation strategy. As to structural policy, the Angolan government approved a new Private Investment Law, which aims at trimming bureaucracy and making fiscal incentives more easily accessible to investors. Both Nigeria and Angola have lodged requests with international financial institutions for financial support.

3.3 Sustaining a float

Three of the observed countries – one middle-income country (Mexico) and two high-income countries (Canada and Norway) – kept the exchange rate of their currencies freely floating while targeting inflation. This regime preservation, however, implied a significant depreciation of their currencies vis-à-vis the U.S. dollar (between roughly one-fifth and two-fifths) prompted inter alia by the fall in oil prices.¹⁸ Yet unlike the group of CIS and African countries, they experienced a more gradual depreciation.

Mexico's domestic economy was relatively well protected from the oil price shock, with GDP growth even increasing slightly to 2.5% in 2015. Private consumption drove the economic expansion. External imbalances rose, however, with the current account deficit coming to just below 3.0% of GDP, while FDI was solid but portfolio inflows were weak. In Canada and Norway, the oil price shock exerted a stronger effect on the real economy, with GDP growth below potential, which itself possibly even declined, slowing to 1.2% and 1.6%, respectively, in 2015 (compare table 1).

While Mexico's GDP growth was least affected, its currency depreciation was most accentuated among the three countries, despite massive dollar sale interventions and key interest rate hikes by the central bank (Banco de México). The most actively traded emerging market currency of the world, the Mexican peso has been the worst-performing freely traded currency of Latin America, losing 45% against the U.S. dollar between mid-2014 and October 2016. Its depreciation, however, also mirrors the start of the U.S. Federal Reserve's exit from its ultra-loose monetary policy, as well as the U.S. presidential elections of 2016 that signal a possible reversal of trade liberalization. Between September 2015 and November 2016, the central bank hiked its key target fund rate in five steps from 3% to 5.25%.

Furthermore, the Foreign Exchange Commission (composed of central bank and finance ministry officials) activated two intervention schemes to preserve "the orderly functioning of the local exchange market." The Banco de México conducted minimum-price auctions, triggering daily sales of USD 200 million or USD 400 million from December 2014 to February 2016 whenever the peso weakened by 1% and 1.5%, respectively, and additional daily U.S. dollar auctions of up to USD 200 million without a minimum price from March to November 2015. In mid-February 2016, the rules-based FX interventions program was suspended in light of the decline of the roughly USD 200 billion stock of foreign exchange reserves by about USD 20 billion since the approval of the intervention arrangement. Since then, the Banco de México has conducted discretionary market interventions with a visible impact on the peso's exchange rate.

In May 2016, the IMF extended its Flexible Credit Line to Mexico for another two years and augmented it to USD 88 billion (from USD 67 billion). This unconditional crisis prevention tool of last resort is granted to reinforce reserves against the background of rising external risks despite strong macroeconomic policies.

Inflation has generally been under control in floating countries, reflecting a moderate pass-through of the exchange rate changes. In Mexico, headline inflation

¹⁸ *The existence of an inverse correlation and bidirectional causality between the value of the U.S. dollar and the price of crude oil has been well established at least since the early 2000s (Breitenfellner and Crespo Cuaresma, 2008; Fratzscher et al., 2014; Wątorrek et al., 2016).*

even decelerated to below the target of 3% and bottomed out at a historical low of 2.1% in November 2015. Canada also witnessed a decline of annual CPI inflation from 1.9% to 1.1% between 2014 and 2015, despite a two-step cut of the monetary policy rate in 2015 that was, however, partly reversed at end-2016. Inflationary pressures due to the pass-through from a weaker Canadian dollar have been overcompensated by lower energy prices and slack in the economy. Only Norway saw its consumer price inflation surging above its flexible 2.5% target to a peak of 4.4% in July 2016, pointing to a possibly nonlinear exchange rate pass-through, as the Norwegian krone had depreciated by more than 30% over the preceding three years (early 2013 to early 2016). The depreciation was reinforced by the loss of the currency's attractiveness as a safe haven when the crisis in the euro area abated. Since the oil price started to plummet in the fall of 2014, Norges Bank, the central bank, has reduced its key policy rate in several steps from 1.5% to 0.5%. Although these steps were in line with the international monetary policy trend, they contributed to the depreciation of the krone exchange rate and to dampening the economic downturn. In Canada, currency depreciation happened more gradually, with little pass-through to inflation.

With regard to financial stability risks, Mexico has a sound financial system without solvency problems and a supervision framework that has been compliant with Basel III capital and liquidity rules since 2015. The regulation of financial groups and foreign bank subsidiaries has been enhanced. Canadian authorities have tightened macroprudential measures to contain vulnerabilities in the housing sector, which has proved effective (so far). Financial stability concerns are greater in Norway, where the housing boom was hardly interrupted by the global financial crisis and where household debt reached 220% of disposable income in 2014. Debt levels and residential real estate overvaluation make Norwegian debtors vulnerable to interest rate increases and income loss risks. Accordingly, Norwegian regulators have strengthened the supervisory framework by increasing capital requirements in anticipation of EU capital regulations, introducing additional capital buffers, as well as by raising mortgage lending risk weights and standards.

Significantly, fiscal policies went in opposite directions in advanced economies and in EMEs with free-float regimes. While Canada and Norway provided fiscal stimuli either through deficit spending or by tapping buffers, Mexico reacted with fiscal consolidation. Mexico displayed deteriorating gross public and external debt-to-GDP ratios (to about 54% and 34%, respectively, in 2015) to levels gradually approaching those of the Mexican peso crisis ("Tequila Crisis") of 1994/95. These surging debt levels partly resulted from a piecemeal decline in oil extraction in the wake of the depletion of old sources and underinvestment in new sources. Under the pressure of looming downgrades by rating agencies (Standard & Poor's and Moody's), the Mexican government in February 2016 announced budget cuts in the order of 0.7% of GDP, mainly consisting of cuts in spending for the state-owned oil company *Petróleos Mexicanos* (PEMEX). The budgets for 2016 and 2017 aim for primary surpluses of 0.3% and 0.4% of GDP, respectively. In contrast, Norway faced the fall in oil prices with large buffers that have provided self-insurance and that have delinked budgets from commodity prices.

In terms of structural reforms, Mexican President Enrique Peña Nieto introduced legislation in August 2014 that abolished the current energy monopoly PEMEX has held since 1938, seeking to reverse the decline in Mexico's oil production

Table 2

Overview of oil exporters' exchange rate policies and systems: 2012–16

Country	Exchange rate arrangement	Exchange system
Angola	<p>2012–13: tightly managed exchange rate</p> <p>2014: from Sept.: managed crawl-like arrangement (controlled depreciation against the U.S. dollar)</p> <p>2015: June, Sept.: devaluations resulting in 31% weakening of the kwanza for the year (discontinuation of crawl)</p> <p>2016: Jan. 5: devaluation of the kwanza by 15% (bringing official exchange rate closer to black market rate); still managed exchange rate</p>	<p>includes multiple exchange rate practices (under Art. VIII, IMF Articles of Agreement) as well as restrictions on access to foreign exchange for invisible transactions, limits on unrequited transfers to foreign-based individuals and other constraints</p> <p>2015: new exchange measures introduced, including a priority list for certain economic sectors for access to U.S. dollars at the official exchange rate</p>
Azerbaijan	<p>2012–14: stabilized managed exchange rate regime (since 2011)</p> <p>2015: early in the year: 20% step devaluation against the U.S. dollar</p> <p>Dec. 21, 2015: another (32%) devaluation against the U.S. dollar and adoption of a managed floating exchange rate regime (gradual movement of exchange rate vis-à-vis the U.S. dollar allowed based on supply and demand factors; monetary authority stands ready to smooth out excess volatility in the market)</p>	<p>free of restrictions on current and capital account transactions, except for restrictions maintained for security reasons (these have been notified to the IMF); early 2016: imposition of capital controls (see above)</p>
Canada	<p>2012–16: free-floating exchange rate regime (since 1970; already between 1950 and 1962)</p>	<p>free of restrictions on current account transactions</p>
Kazakhstan	<p>2012–13: managed crawl-like exchange rate arrangement (tenge has been consistently tracking a trend against the U.S. dollar within a 2% margin)</p> <p>2014: Feb.: following an 18% step devaluation, the tenge stabilized within a trading band around KZT 185/USD (=transition from crawl-like to stabilized managed exchange rate arrangement)</p> <p>2015: Aug. 20: adoption of a floating exchange rate regime (central bank intervenes “to fight speculative moods” and aims at gradual withdrawal from foreign currency market)</p>	<p>free of restrictions on current account transactions</p>
Mexico	<p>2012–16: free-floating exchange rate regime (since 2011), but interventions to smooth exchange rate fluctuations</p>	<p>free of restrictions on current account transactions</p>
Nigeria	<p>2012–14: managed exchange rate arrangement (exchange rate band vis-à-vis the U.S. dollar)</p> <p>2015: from March: exchange rate pegged to the U.S. dollar (at NGN 198/USD within a 2% band)</p> <p>2016: June 20: adoption of a floating exchange rate regime</p>	<p>includes multiple currency practices (under Art. VIII, IMF Articles of Agreement) as well as restrictions on access to foreign currency for payments for various types of imports and for non-priority transactions as determined by the central bank, as well as other constraints</p>
Norway	<p>2012–16: free-floating exchange rate regime (since 2011), but interventions to smooth exchange rate fluctuations</p>	<p>free of restrictions on current account transactions</p>
Russia	<p>2012–13: managed exchange rate arrangement (with corridor related to bi-currency basket of U.S. dollar and euro)</p> <p>2014: Nov. 10: floating exchange rate regime adopted (interventions occur only if financial market stability is threatened)</p>	<p>free of restrictions on current and capital account transactions</p>
Saudi Arabia	<p>2012–16: conventional peg to the U.S. dollar (since 1986)</p>	<p>free of restrictions on current account transactions, except for security-related restrictions</p>
United Arab Emirates	<p>2012–16: conventional peg to the U.S. dollar (since 1997)</p>	<p>free of restrictions on current and capital account transactions, except for restrictions maintained for security reasons (these have been notified to the IMF)</p>

Source: IMF Article IV staff reports (2014 to 2016) for Angola, Azerbaijan, Canada, Kazakhstan, Nigeria, Norway, Russia, Saudi Arabia, and the United Arab Emirates; IMF Country Report No. 14/323: Mexico. Arrangement under the Flexible Credit Line and Cancellation of the Current Arrangement; authors' compilations.

and to open up the sector to private investment. While this policy might contribute to increasing economic productivity, it will certainly not reduce Mexico's dependence on oil. In the event, PEMEX reported record losses in 2015 (more than 50% higher than in 2014) caused by the fall in crude oil prices and higher taxes, prompting Moody's to cut PEMEX's credit rating.

4 Assessment and concluding remarks

The sharp fall in oil prices since 2014 has led major oil exporters (defined here as countries that exported the highest U.S. dollar value of crude oil in 2015) to react in one of three ways. The first group of countries upheld their currency pegs, typically to the U.S. dollar (Saudi Arabia, U.A.E.). This group chose to retain its pegs to keep inflationary pressures low and to shield the financial sector (up to a certain degree) from turbulences while accepting continuing pressures on the current account, on international reserves and on budget revenue. The second group of countries chose to let their currencies depreciate by repegging their currency (typically on repeated occasions, Angola) or, more often, by making their exchange rate regimes more flexible (Russia, Kazakhstan, Azerbaijan, Nigeria). Finally, the third group of countries kept their floating exchange rates (Mexico, Canada, Norway) and let their currencies depreciate. In the majority of countries, these policy decisions were taken to counteract economic pressures (swiftly dwindling international reserves, expanding external and budget disequilibria, and insufficiently effective capital controls). Because they were caught off guard, a number of countries' institutions (monetary policy, foreign exchange and financial market frameworks) were not well prepared to operate successfully in the new macrofinancial environment. The need to react to unforeseen circumstances may, in turn, have compounded the degree of instability and economic turbulence that followed the exchange rate regime switch.

However, as policymakers gain experience, these governance problems should become smaller and the increased economic flexibility generated by the more flexible exchange rate regime should play a greater role. Certainly, devaluation tended to push up inflation, and balance sheet effects increased dollarization and credit risk in the financial sector as well as the ratio of external debt to GDP.¹⁹ Weak confidence in the depreciated domestic currency and economic stress for banks may have contributed to banking sector turbulences and crises. On the other hand, while inflation is already receding in some countries, depreciation has rendered non-oil exports and import-competing production cheaper (expressed in foreign currency) and thus more competitive. The negative impact of the oil price plunge on current account balances is easing or can be expected to ease, and international reserves (which are also higher as a ratio to GDP than before depreciation) are eroding less than they would without depreciation and in some cases are already recovering. Meanwhile, the fiscal impact of the oil price decline is being cushioned somewhat by the devaluation.

¹⁹ Interestingly, an already existing high or moderate level of dollarization prior to the oil price plunge does not appear to have tipped the scales in favor of or against devaluation in our observed countries. As explained above, the deterioration of external and fiscal balances, alongside the erosion of buffers, seems to have played a more important triggering role.

Overall, about two years after the initial strong oil price slide of 2014, the countries that have sustained their currency pegs look economically and politically more stable so far (Saudi Arabia, U.A.E.) than the countries that have abandoned their (original) pegs or that have floated their currencies. The possible exception is Russia, which carried out its monetary regime change earlier (in November 2014) than any of the other countries examined that moved to flexible exchange rates. The greater observed financial stability of countries that retained their fixed exchange rates is certainly partly due to their still large, if eroding, buffers and, more recently, to their readiness to resort to procyclical fiscal policies.

Looking ahead and, like most forecasters, assuming that oil prices will tend to remain low and stabilize or rise only slightly, the players that floated their currencies may have “digested” the often turbulent impact of this change in two to three years and in any case are likely to have accumulated some experience with flexible exchange rates. Countries that have retained their pegs will probably continue to be exposed to pressure on their external balances and currencies as well as to further erosion of their international reserves. How long these countries can succeed in sustaining such continued exposure in the above oil price scenario may depend on how much crisis-triggered fiscal consolidation they are willing to implement, and, of course, on the size of their remaining external and fiscal buffers.

The impact of the oil shock on the exchange rates of countries that had floating exchange rate regimes and inflation-targeting monetary policies prior to the oil price plunge and that have upheld these regimes and policies, like Canada, Norway and, to a lesser extent, the emerging market economy Mexico, was comparatively modest; financial market turbulences were fairly limited, and inflation pass-through was low. These countries’ policy reactions differed depending on their fiscal space, monetary credibility, and the occurrence of additional shocks. While Canada and Norway loosened their monetary and fiscal policies, providing macroeconomic stimuli, Mexico aimed at warding off financial stability concerns and carried out procyclical interest rate hikes, fiscal consolidation and foreign exchange market interventions. Despite all their differences, these policies seem to have been similarly effective in stabilizing the local economies. However, these three countries have fairly diversified economic structures and are less dependent on hydrocarbon extraction and exports than the emerging and developing countries discussed above (Dąbrowski, 2015). Actually, it appears that this structural diversity not only makes economies less vulnerable to sectoral shocks but also equips them better to float their exchange rates.

That said, the choice of a commodity exporter’s currency regime should not be a short-run decision, but rather the result of a long-term development strategy requiring a sequence of adequate reforms in economic governance as well as product and factor markets. To the extent that a negative commodity price shock implies an abrupt decline of resource dependence, this process might be involuntarily accelerated and require a faster than planned regime shift toward more flexible foreign exchange rates. Another lesson that can be drawn is that the sustainable conduct of prudent budgetary policies pays off in difficult times, even if it is hard to determine how large adequate fiscal buffers would have to be (Danforth et al., 2016). Any reserve fund size could eventually be tested; however, using these funds buys time for crisis adjustment measures to show results. If such funds are large enough, they not only help buy time but also give countries greater leeway to

Table 3

Some relevant country traits and oil crisis-linked policy choices in a nutshell

Country	Develop- ment status	Degree of structural diversity (see table A1)	Size of external/ fiscal buffers (see table A2)	Policy response to oil price plunge	
				Exchange rate regime	Macroeconomic stance
Angola	Emerging	Low	Medium	Re-pegging to U.S. dollar (with exchange controls)	Tight
Azerbaijan	Emerging	Low	Medium	Flexibilization: move to managed floating	Mixed
Canada	Advanced	High	Low	Free floating	Stimulus
Kazakhstan	Emerging	Low	Medium	Flexibilization: move to floating	First stimulus, then tightening
Mexico	Emerging	High	Low	Floating	Tight
Nigeria	Emerging	Low	Low	Flexibilization: move to floating (with exchange controls)	Mixed
Norway	Advanced	Medium	High	Floating	Stimulus
Russia	Emerging	Medium	Medium	Flexibilization: move to floating	Tight
Saudi Arabia	Emerging	Low	High	Peg to U.S. dollar	First stimulus, then tightening
United Arab Emirates	Emerging	Medium	High	Peg to U.S. dollar	First stimulus, then tightening

Source: Authors' compilations.

strategically influence commodity prices (within a cartel). Finally, at least those countries under observation that kept their exchange rates floating (freely) command a well-stocked toolbox of e.g. monetary, currency, fiscal, macroprudential and structural policy measures to react to commodity price shocks. Many of the policy choices hinge on being able to judge whether a shock is temporary or permanent. For instance, temporary shocks require fiscal expansion while permanent shocks require the opposite, fiscal tightening. Because they assumed the oil price shock was temporary, countries like Saudi Arabia, the U.A.E. and Kazakhstan tried to spend first and retrenched later when the price did not recover as expected. The trial-and-error experience of our small sample of countries confirms the truism that effective crisis management is both an art and a science.

Table 3 provides a concluding snapshot of some relevant characteristics and policy choices of the ten observed oil-exporting countries faced with a substantial and sustained oil price decline since 2014. The following findings catch the eye: Advanced economies tend to display medium to high degrees of structural diversity, whereas most of the EMEs feature low degrees of structural diversity. As a rule, an advanced and highly diversified economy like Canada does not need large external or fiscal buffers. If an EME with a low to medium degree of diversity intends to keep its fixed exchange rate regime (without repegging), it is well advised to have high external or fiscal buffers at its disposal (like Saudi Arabia and the U.A.E.), ideally complemented by the capacity to apply capital controls as a last resort. In other words, EMEs with peg-like regimes, limited diversification, small to medium-sized buffers as well as weak institutional conditions for capital controls will probably not be able to uphold their exchange rate choices²⁰ if they have to cope with a large and extended deterioration of the terms of trade. They

²⁰ In most cases, such EMEs will probably not be able to defend their exchange rate regime even if they perform painful internal devaluations, including sizeable cuts in wages or salaries.

should opt for more flexibility sooner rather than later, like Russia did. Taking up additional debt to help defend a fixed exchange rate may be an option only if a country continues to enjoy market confidence. Otherwise, borrowing may turn out to be an onerous and possibly futile exercise. Clearly, to some extent external and fiscal buffers are just as useful as structural diversification. Yet, even a modest buffer might prove helpful for an oil-exporting economy. A long-term strategic aim could be to reduce the need for buffers by promoting diversification, which, if successful, could also contribute to moving an economy up the rungs of the development status ladder. Although the declining weight of oil revenues in GDP implied by the oil price slump provides for some passive diversification, a more active strategy is preferable in times when oil prices are high. Creating external buffers is an important part of this strategy, as it may help take Dutch disease-like price pressures from the domestic market. Reining in such effects is a necessary but certainly not sufficient condition for developing an economy that is less dependent on oil.

At the time of writing, an apparently credible attempt of OPEC, Russia and other oil producers to cut oil extraction by some 1.2 million barrels a day relieved some pressure on major oil-exporting countries to adjust. Subsequently, the price of Brent crude rose by around 15% to substantially above USD 50 per barrel in late 2016. While further price increases cannot be excluded, they may tend to be limited because shale oil producers, particularly in the U.S.A., can react elastically to oil price increases by simply reopening fracking wells shut down when prices fell below their break-even point. In the medium run, however, the oil price is also influenced by the massive reduction of investment in new pumping capacities in parallel to the oil price slump since 2014. Conversely, uncertainties about global demand developments make oil producers inherently vulnerable. In sum, a temporary oil price stabilization should not divert attention from the long-run need to diversify resource-dependent economies.

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Annex

Table A1

Share of oil and gas in the economy

Country	Share in GDP (2011)	Share in total merchandise exports (2014)	Share in total budget revenues (2014)	Average share	Assessed degree of structural diversity ¹
	%				
Angola	47	97	69	71	Low
Azerbaijan	45	93	70	69	Low
Canada	9	11	31	17	High
Kazakhstan	31	77	49	52	Low
Mexico	9	11	31	17	High
Nigeria	14	91	62	56	Low
Norway	20 ²	47	27	31	Medium
Russia	18	70	31	40	Medium
Saudi Arabia	59	85	87	77	Low
United Arab Emirates	24	43	66	44	Medium

Source: Authors' compilations and calculations.

¹ If the average share of oil- and gas-related revenues in the above-mentioned three indicators (GDP, merchandise exports, budget revenues) is relatively high, then the assessed degree of structural diversity is relatively low and vice versa. Assessment: low: >50%, medium: >20% and <50%, high: <20%.

² 2014.

Table A2

Size of aggregated external and fiscal buffers¹

Country	External buffers	Fiscal buffers	Sum	Assessment of size ²
	% of GDP (end-2014)			
Angola	21.5	3.9	25.4	Medium
Azerbaijan	18.6	49.3	67.9	Medium
Canada	4.2	0.8	5.0	Low
Kazakhstan	14.2	35.6	49.8	Medium
Mexico	15.2	0.1	15.3	Low
Nigeria	6.0	0.8	6.8	Low
Norway	13.4	254.6	268.0	High
Russia	19.0	8.2	27.2	Medium
Saudi Arabia	96.1	50.0	146.1	High
United Arab Emirates	19.5	211.2	230.7	High

Source: Authors' compilations and calculations.

¹ External buffers: international reserves; fiscal buffers: budgetary stabilization and/or sovereign wealth funds.

² Assessment: low: <20%, medium: >20% and <80%, high: >80%.