

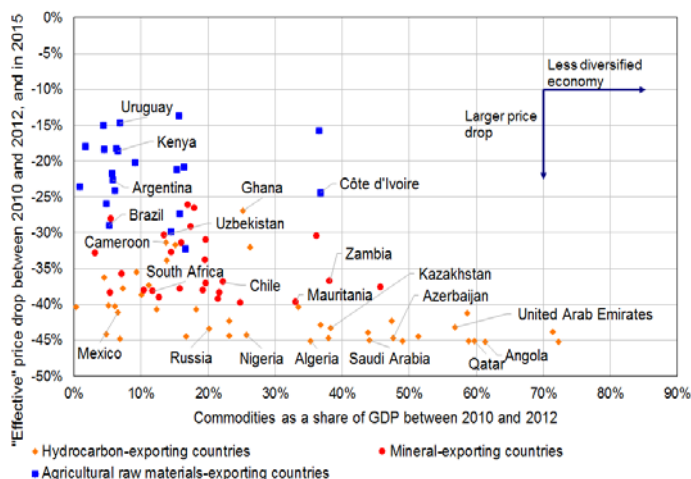
Impact of foreign exchange policies for commodity-exporting countries

- Commodity prices plummeted between 2014 and 2016. Oil prices fell by half, mineral prices were down by approximately one-third and agricultural raw materials prices tumbled by 20%. Despite the recent upturn in prices, low prices have done considerable damage to exporting countries' current account balances, especially countries without diversified economies.
- Commodity-exporting countries adjusted in different ways, depending on the severity of the shock, their leeway for changing economic policies and their foreign exchange regime (fixed or floating exchange rates). Some countries ended up loosening their foreign exchange regime, as in the case of Russia and Egypt.
- Economic theory, along with the experience of recent years, suggests that the most appropriate foreign exchange regime depends on the individual characteristics of each economy. For countries with fairly diversified economies, a floating exchange rate is generally an advantage, since a dip in the exchange rate improves the competitiveness of their non-commodity exports and provides a boost for their medium-term current account balances and growth.
- In contrast, for commodity-exporting countries that do not have diversified economies or countries that have only a single export (mainly countries in the Middle East or Africa), a dip in the exchange rate does not usually boost export volumes, since their commodity exports are priced in foreign currencies on international markets. In this case, a lower exchange rate contributes to improving the current account balance merely by raising the price of imports. This reduces import volumes, leading to inflation and lower growth.
- This means that a fixed exchange rate could be better for an exporting country without a diversified economy or a country with a single export, as long as the central bank has enough credibility to maintain the currency peg. However, if low commodity prices persist, an adjustment eventually becomes inevitable. In the medium term, this is often achieved through fiscal consolidation, which is an important means of improving the current account balance. In the longer term, economic diversification mitigates the country's vulnerability to shocks. This often requires efforts to avoid setting an excessively high exchange rate.
- Some countries lack the necessary foreign exchange reserves to maintain their currency peg when commodity prices are low. In such cases, central bank intervention on foreign exchange markets to defend an unsustainable peg may be counterproductive. Even though switching to a floating exchange rate may trigger abrupt adjustment, this step should be taken before foreign exchange reserves are depleted. In this manner, the remaining reserves can be used to manage volatility and preserve financial stability, particularly when economic agents' debts are denominated in foreign currencies.

Source: IMF, Central banks, DG Trésor.

Key: The "effective" price drop indicator shows the average fall in commodity prices between 2010-2012 and 2015. The price drop is weighted according to the share of exports that each commodity represents for each country. The colour for each country corresponds to its main commodity export.

Hydrocarbon-exporting countries saw the largest drop in their export prices and generally have less diversified economies



1. Commodity-exporting countries' foreign exchange regimes are linked to the characteristics of each economy and has an impact on how they adjust to falling commodity prices

Commodity prices dropped sharply between 2014 and 2016. This was true for oil and gas prices, which fell by some 50%, and, to a lesser extent, for mineral prices, which were down by 30% and agricultural raw materials, which dropped by 20%. Lower prices meant reduced export earnings and damaged the exporting countries' current account and fiscal balances. This led to pressure on exchange rates, triggering major depreciation of the currencies of countries with floating exchange rates. In countries with fixed exchange rates, central banks had to draw on their foreign exchange reserves to maintain their currency peg. Some countries were forced to devalue their currencies, as their reserves ran low, and some even switched to a floating exchange rate (see Box 1).

1.1 Economic theory states that a floating exchange rate generally facilitates adjustment to negative shocks for countries with relatively diversified economies

In a relatively diversified economy with a floating exchange rate, a negative price shock generally brings about a depreciation of the exchange rate, which raises import prices and channels domestic demand to domestic production. A lower exchange rate also produces price competitiveness gains for non-commodity exports and increases earnings from exports denominated in the national currency. This price adjustment mitigates the contraction of domestic demand and the recessionary effect of the shock. Economic adjustment takes an even lighter toll when countries with floating exchange rates have independent monetary policies and credible central banks.

In a diversified economy, adjustment to a negative shock tends to take a heavier toll on growth if the exchange rate is fixed, since the need to maintain the fixed parity means that adjustment cannot be achieved through prices. Therefore adjustment is achieved by a contraction of domestic demand.

However, the impact that currency depreciation has on the economy depends on economic agents' financial situation. If they have large foreign currency debt, depreciation increases their foreign debt load and may undermine financial stability and growth, but it can also have positive wealth effects for agents that hold foreign currency assets. Furthermore, a stable exchange rate vis-à-vis trading partners that share the same currency helps reduce exchange rate risk for economic agents and promotes trade with those countries.

1.2 In the case of economies that are not diversified or have a single export, a fixed exchange rate is an advantage, provided the central bank's credibility is strong enough

In economies that are not diversified or that have a single export, a depreciation of the exchange rate has a limited impact on current account balance adjustment achieved through changes in quantities. Competitiveness gains achieved through depreciation of the national currency do not help boost export volumes, since exports consist nearly exclusively of commodities that are priced in hard currencies on international markets.

Box 1: Commodity-exporting countries let their currencies float

Falling commodity prices caused several countries to abandon their fixed exchange rates in recent years. In turn, Russia (November 2014), Kazakhstan (August 2015), Azerbaijan (December 2015), Argentina (December 2015) and Egypt (November 2016) each switched to a floating exchange rate in response to immense downward pressure on their currencies.

Some countries decided on a more flexible foreign exchange regime relatively early, thereby preserving fairly large foreign exchange reserves, while others waited until they were forced to switch by dwindling or even exhausted reserves. For example, Russia still had a comfortable level of reserves, equivalent to some 14 months of imports, when it switched to a floating exchange rate. However, its reserves were greatly diminished, particularly in the quarter before it abandoned its currency peg, when they fell by 17%. Kazakhstan also had large reserves, equivalent to some 25 months of imports, thanks to its substantial oil fund. However, it had to loosen its foreign exchange regime to bring its monetary policy into line with that of Russia, its main trading partner. Argentina's reserves, equivalent to 4 months of imports, were much smaller. They were still sufficient to maintain the currency peg in the short term, but their 25% contraction over one quarter showed that the peg was not sustainable in the longer term. This was also the case for Egypt, which had reserves equivalent to 3 months of imports and saw a 17% contraction in the quarter before it gave up its currency peg. Nigeria had reserves equivalent to 4 months of imports and saw a 3% drop in reserves before devaluing the naira in June 2016 in the face of a foreign currency shortage. Azerbaijan waited until its reserves were virtually exhausted, with only enough foreign currency to cover one month of imports after falling by half over one year. Only then did it move to a more flexible foreign exchange regime.

Falling commodity prices played a decisive role in foreign exchange regime changes, but factors that were specific to certain countries, such as Mauricio Macri's accession to power in Argentina and the international sanctions against Russia, also played a major part. All of these countries now have exchange rates that are freely determined by currency supply and demand, with the exception of Nigeria, where the central bank still intervenes to support the naira, which is consequently overvalued, given the country's economic fundamentals.

The abandonment of a peg to a basket of currencies in Russia, or a dollar peg in Argentina, Azerbaijan, Egypt and Kazakhstan, was followed by a major depreciation of these countries' currencies over relatively short periods: the Russian rouble dropped by up to 37% against the dollar between November 2014 and February 2015, the Argentinian peso fell by 39% between December 2015 and March 2016, the Kazakh tenge lost 51% of its value between August 2015 and January 2016 and the Azerbaijani manat shed 36% of its value between December 2015 and March 2016. The Nigerian naira also saw a major depreciation, falling by 38% between June and August 2016, but the slide was limited by central bank intervention.

The abandonment of fixed exchange rates in these countries had a recessionary effect initially. The depreciation drove Russia's inflation rate up by 7 points between 2014 and 2015. The IMF forecasts show inflation rates rising by 6 points between 2015 and 2016 in Azerbaijan and Nigeria and by 7 points in Kazakhstan over the same period. Furthermore, the switch to a floating exchange rate in relatively undiversified economies dampened domestic demand, which, combined with lower commodity prices, contributed to recession in the short term, with negative growth of 1.8 in Argentina, 2.4% in Azerbaijan and 1.7% in Nigeria, according to the IMF. Russia's economy shrank by 3.0% in 2015.

Furthermore, import substitution was hampered by the lack of development in certain non-commodity sectors. Rising import prices resulting from currency depreciation led to higher inflation and a contraction of domestic demand. More specifically, output in sectors that rely on imports of intermediate goods is affected by higher import prices.

This means that, in the case of a commodity-exporting country without a diversified economy, or a country with a single commodity export, a fixed exchange rate, with a credible currency peg, has the advantage of more stable import purchasing power over time.

However, a fixed exchange rate is not sustainable unless the central bank has enough foreign exchange reserves to withstand potential pressure to depreciate its currency. Such reserves must be built up during economic upswings, when commodity prices are high and countries accumulate current account surpluses. If reserves are too small to maintain the currency peg in the face of pressure to depreciate, governments sometimes resort to more or less strict capital controls to ration the supply of foreign currency. If reserves run out, governments are forced to devalue their currencies or even give up fixed exchange rates, as has been the case in a number of countries in recent years.

2. Analysis of the sample of commodity-exporting countries shows that they are not on an equal footing for coping with falling prices

2.1 The sample covers a very heterogeneous group of countries coping with shocks of varying severity

This study covers 89 commodity-exporting countries¹ with very different profiles. The majority of these countries are located in Africa (38%), South America (22%), Asia (17%) and the Middle East (8%). Their exports are hydrocarbons (49%), minerals (27%) and agricultural raw materials (24%). They have achieved very different levels of development; the sample includes many emerging and developing countries, along with five developed countries. The exporting countries are heavily dependent on commodities, which account for 63% of their total exports on average, even though the individual countries' situations vary greatly. Furthermore, these countries have fairly open economies on the whole, with a trade-to-GDP ratio² of 41% on average.

In terms of foreign exchange regimes³, the majority of countries in the sample have "conventional" fixed exchange rates⁴ (55%). The others have floating exchange rates (32%), hard currency pegs⁵ (9%) or intermediate foreign exchange regimes, with fluctuation bands⁶ (5%). Of the countries with fixed exchange rates, 52% have pegged their currency to the dollar and 25% to the euro (as is the case for the CFA franc countries).

Hydrocarbon-exporting countries seem to be the most reliant on commodities, which account for 72% of their exports on

average, compared to 65% for mineral-exporting countries and 49% for agricultural raw materials-exporting countries. More of the hydrocarbon-exporting countries have opted for a fixed exchange rate (82% of the countries in the sample, compared to 41% of mineral-exporting countries). This pattern is consistent with economic theory. Many of the agricultural raw materials-exporting countries have floating exchange rates (40%).

Hydrocarbon-exporting countries generally posted fiscal and current account surpluses between 2010 and 2012, before prices fell. In contrast, agricultural raw materials-exporting and mineral exporting countries showed deficits on average (see Table 1). The severity of the shock for each country varied according to the characteristics of their individual economies. To measure the shocks, we built a rough indicator called "effective severity of the shock". The indicator is an estimate of the drop in the value of exports expressed in percentage points of GDP caused by falling commodity prices under the assumption that export volumes remain constant⁸. This indicator reveals large disparities between countries. Hydrocarbon-exporting countries are more exposed to falling prices (with an average shock of 13 percentage points of GDP) than mineral-exporting countries (7 percentage points of GDP) and agricultural raw materials-exporting countries (2.5 percentage points of GDP).

(1) The sample excludes 14 countries because their situations are too atypical (e.g. military conflicts).

(2) This is the average value of exports and imports expressed as a percentage of GDP.

(3) For the sake of simplicity, we distinguish between fixed and floating exchange rates based on actual practices and not what the law says.

(4) Under a conventional fixed exchange rate regime, the national currency is pegged to a currency or a basket of currencies. The regime may include a fairly narrow fluctuation band (e.g. $\pm 1\%$).

(5) Hard currency pegs are less common and more rigid. They include dollarisation or eurorisation, along with currency board regimes. Under a currency board regime, the central bank holds reserves of foreign currency that are exactly equal to the amount of national currency in circulation. This regime ensures total credibility for the currency peg, but entails a total renunciation of independent monetary policy. Dollarisation and eurorisation occurs when monetary authorities give up their national currency and replace it with the dollar or the euro.

(6) Intermediate foreign exchange regimes cover systems where the local currency has a fluctuation band of more than 1%.

(7) This figure excludes developed countries that are hydrocarbon exporters, such as Norway or Canada.

(8)
$$\left(\sum_{i=1}^3 \frac{\text{exportations}_{i, 2010-2012}}{\text{totalofexportations}_{2010-2012}} \cdot \Delta \text{price}_{i, 2010-12/2015} \right) \cdot \left(\sum_{i=1}^3 \frac{\text{exportations}_{i, 2010-2012}}{\text{GDP}_{2010-2012}} \right)$$
 Where i is the type of

commodity exported (hydrocarbons, minerals, agricultural raw materials). The higher the indicator, the more exposed the country is to a drop in prices and the more severe the export price shock is in percentage points of GDP. It should be noted, however, that the net negative effect of lower prices is mitigated in some countries by lower prices for commodity imports, as in the case of agricultural raw materials-exporting countries that import hydrocarbons.

Table 1: Fundamentals of commodity-exporting countries before prices fell, by type of exports

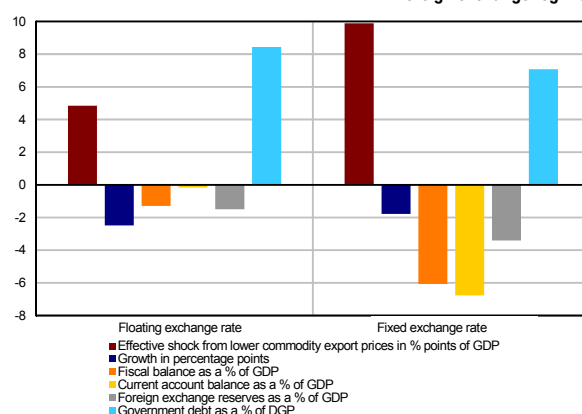
Types of commodities exported	Share in the sample	Real GDP growth	Fiscal balance< (% of GDP)	Current account balance (% of GDP)	Government debt (% of GDP)	Foreign exchange reserves(% of GDP)
		2010-2012 Average				2012Q4 Average
Hydrocarbon	47%	4.9%	2.3%	4.5%	34.1%	22.4%
Minerals	29%	5.6%	-2.3%	-8.5%	39.7%	18.5%
Agricultural raw materials	24%	4.8%	-1.9%	-6.2%	38.0%	16.6%

Sources IMF, Central Banks, DG Trésor calculations.

2.2 The situation of commodity-exporting countries has worsened since prices fell

On the whole, the situation of commodity-exporting countries has worsened substantially (see Chart 1). Countries with floating exchange rates have fared slightly better on average because of currency depreciation. However, the differences in adjustment to lower commodity prices cannot be attributed solely to foreign exchange regimes. Economies with fixed exchange rates are generally more reliant on commodities, with less diversified exports accounting for a larger share of GDP than in countries with floating exchange rates. Consequently, countries with fixed exchange rates suffered larger shocks.

Chart 1: Main macroeconomic aggregates between 2010-2012 and 2015, by foreign exchange regime



Source: DG Trésor.

As expected, low commodity prices led to currency depreciation for countries with floating exchange rates, with an average slide of 33% in the value of their currencies against

the dollar between the fourth quarter of 2012 and the fourth quarter of 2015⁹.

Countries with fixed exchange rates drew down their foreign exchange reserves to cope with pressure on their currencies and maintain their parities. The reserves of these countries contracted by 3.4 percentage points of GDP between the fourth quarter of 2012 and the fourth quarter of 2015, compared to a drop of 1.4 percentage points of GDP in the reserves of countries with floating exchange rates. Faced with severe pressure on their currencies and rapid depletion of their foreign exchange reserves, some countries with fixed exchange rates had to devalue or even unpeg their currency. The average depreciation of the currencies of countries with fixed exchange rates against the dollar stood at 17% between the fourth quarter of 2012 and the fourth quarter of 2015.

We used principal component analysis on a number of macroeconomic variables (see Box 2) to summarise the main characteristics of commodity-exporting countries and their response to low prices. This analysis revealed two main components: external vulnerability (current account and fiscal balances, government debt and foreign exchange reserves) and real GDP growth. The situation of each country before the shock (i.e. between 2010 and 2012) is compared to its situation after the shock (in 2015) with regard to these two components.

The external vulnerability and growth of commodity-exporting countries both deteriorated between 2010-2012 and 2015 (see Chart 2). The deterioration stems from shocks and economic policy responses that varied from one country to the next (see below). The main macroeconomic aggregates are also driven by other country-specific factors, such as political and geopolitical tensions, financing terms and even weather.

Box 2: Principal component analysis methodology

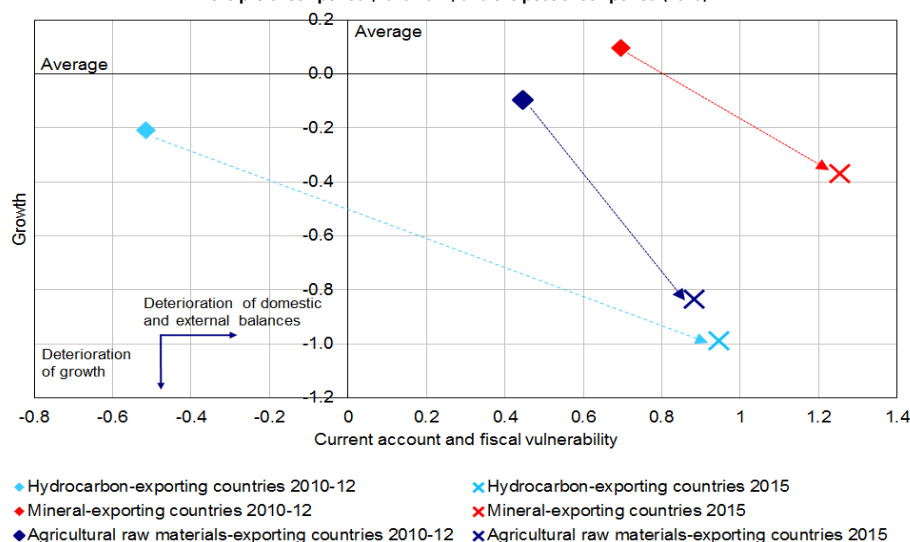
Principal component analysis is used to sum up the information from a larger set of variables in a smaller number of variables. In this case, the analysis considered five variables: average government debt between 2010 and 2012 as a percentage of GDP; average fiscal balance between 2010 and 2012 as a percentage of GDP; average current account balance between 2010 and 2012 as a percentage of GDP; foreign exchange reserves in the fourth quarter of 2012 as a percentage of GDP and the rate of real GDP growth between 2010 and 2012. This statistical method is used to take information from data series and chart the similarities between "individuals" (the 89 commodity-exporting countries in this case) with regard to the variables considered.

For the purposes of this study, two interpretable linear combinations of data are used. The first has major weightings for government debt, foreign exchange reserves and the fiscal and current account balances. This x-axis can be interpreted as representing the quality of the individual countries' external and domestic economic fundamentals. The y-axis features heavily weighted GDP growth rates. The other variables do not make much difference.

Principal component analysis was based on data from 2010 to 2012 and the data from 2015 was projected onto the previously constructed axes. Positive coordinates are seen as characteristics that are better than the average for the countries in the sample between 2010 and 2012 and negative coordinates are interpreted as worse than average characteristics.

(9) A large share of government debt is denominated in foreign currencies. This share averaged 66% for countries with floating exchange rates in 2014, compared to 59% for countries with fixed exchange rates. Consequently, depreciation increases the value of outstanding government debt in the local currency.

Chart 2: Average change in the countries' situations by type of commodity exports between the pre-shock period (2010-2012) and the post-shock period (2015)



Source: DG Trésor.

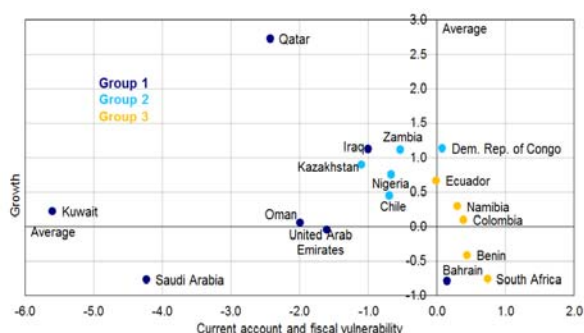
Key: the y-axis does not represent observed growth. It represents the "growth" component in the principal component analysis (where individual data points cannot be interpreted directly). If a country moves down between 2010-2012 and 2015, it means slower growth. If a country moves to the right, it means greater fiscal and/or external vulnerability (i.e. a deterioration of its current account and/or fiscal balances, a decline in reserves and/or an increase in government debt as a percentage of GDP). Each category corresponds to the average for the countries, depending on their main type of commodity export (hydrocarbons, minerals, agricultural raw materials).

3. Analysis of economic policy responses focusing on three groups of commodity-exporting countries

We divided the 89 countries in the sample into three sub-samples to illustrate the consequences of their foreign exchange regime choices and their economic fundamentals:

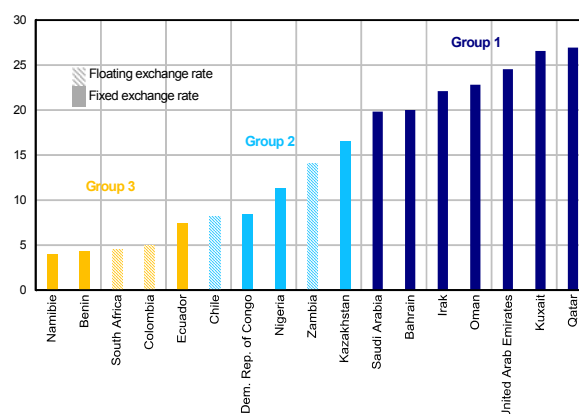
- The Gulf countries (Group 1). Most of these countries do not have diversified economies and depend heavily on oil exports. All of them had fixed exchange rates, but with very different degrees of room for manoeuvre before the shock, particularly in terms of foreign exchange reserves (see Chart 3).
- A group of countries with medium vulnerability before the shock and suffering from a medium-severity shock (Group 2, see Chart 4). The group includes both countries with fixed exchange rates and countries with floating exchange rates, which allows us to compare them.
- A group of fairly vulnerable countries, but suffering a more modest shock (Group 3). Comparisons between countries with fixed and floating exchange rates are also possible within this group.

Chart 3: Pre-shock situations (2010-2012)



Source: DG Trésor.

Chart 4: Gross effective shock severity indicator*



Source: DG Trésor.

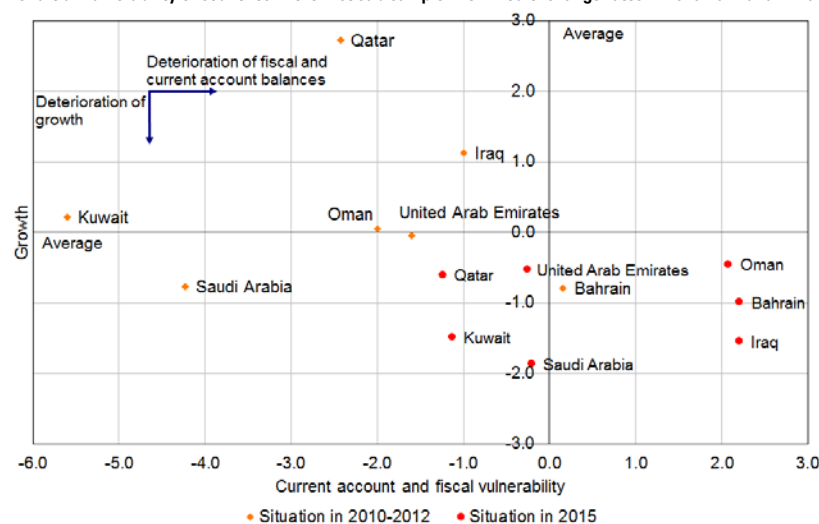
*Effective shock of lower prices in percentage points of GDP, see footnote 8.

3.1 Focus on a sample of oil-exporting countries in the Persian Gulf with fixed exchange rates and differing economic fundamentals before prices fell (Saudi Arabia, Bahrain, United Arab Emirates, Iraq, Kuwait, Oman and Qatar)

The Gulf countries in this sub-sample have a single export, oil: commodities account for 83% of their exports on average and their trade-to-GDP ratio is high at 54%. All of these countries are net commodity exporters with fixed exchange rates. They suffered a very severe shock when prices dropped. The value of their commodity exports fell by 23 percentage points of GDP¹⁰, which led to a massive deterioration of their fiscal and current account balances, which declined by 17 and 19 percentage points of GDP respectively. Despite this, some countries managed to maintain fiscal and current account surpluses, as was the case in Qatar. Growth slowed substantially in the countries in this group, falling by 3.5 percentage points on average between 2010-2012 and 2015. Nevertheless, all of these countries managed to maintain their fixed exchange rates by drawing on the foreign exchange reserves that they had accumulated when commodity prices were high.

Despite these shared circumstances, not all of these countries were on an equal footing to cope with falling commodity prices. Before the shock, Saudi Arabia, Kuwait and Qatar had huge fiscal surpluses, averaging 16% of GDP in 2010-2012, and current account surpluses averaging 30% of GDP, as well as very little government debt, which stood at 14% of GDP on average. In contrast, Bahrain was already running a fiscal deficit of 3.5% of GDP and had, along with Iraq, accumulated fairly substantial government debt, standing at an average of 42% of GDP. Furthermore, Saudi Arabia had large foreign exchange reserves, standing at USD 616 billion in the fourth quarter of 2015, which is equivalent to 45 months of imports, and the United Arab Emirates had a fairly diversified economy. On the other hand, Bahrain and Oman had little financial leeway to mitigate the shock, which was equivalent to 2 percentage points of GDP since 2012, given their small foreign exchange reserves, which were equivalent to only 3 months and 5 months of imports respectively at the end of 2015. This means that the vulnerability of oil-exporting countries depends on the size of their foreign exchange reserves and the diversification of their economies.

Chart 5: Vulnerability of countries in the first sub-sample with fixed exchange rates in 2010-2012 and in 2015



Source: DG Trésor.

Key: see key to Chart 2.

3.2 Focus on a sub-sample of countries with fiscal and current account balances nearly in equilibrium before commodity prices fell (between 2010 and 2012) that then suffered major shocks (Chile, Kazakhstan, Nigeria, Democratic Republic of Congo, Zambia)

The countries in this sub-sample were selected because their situations before the shock were fairly similar: they had similar levels of economic diversification, with commodities accounting for an average of 74% of their exports, and comparable levels of fiscal and current account vulnerability. The shocks they suffered were also of comparable severity. On the other hand, their foreign exchange regimes are a discriminating item that enables us to analyse differences in their adjustment to low commodity prices.

On average, these countries' fiscal and current account balances were nearly in equilibrium in 2010-2012, standing

at 0.8% and 0.4% of GDP respectively. They had low levels of government debt, at 16% of GDP on average and comfortable foreign exchange reserves, standing at 11% of GDP. These countries suffered major shocks when the prices of their commodity exports fell, causing the value of their exports to decline by an average of 12 percentage points of GDP. However, the severity of the shock was less than the shock suffered by the Gulf countries cited above, since the countries in this sub-sample had more diversified economies.

The countries in this sub-sample with fixed exchange rates before the shock (Kazakhstan, Nigeria, Democratic Republic of Congo) suffered a smaller deterioration of their situations on average than the countries with floating exchange rates (Chile, Zambia), where other more specific factors, such as the drought in Zambia, harmed their economies. Nigeria's situation is specific however: the country's currency was devalued.

(10) The figures given are averages for the countries in the sub-sample.

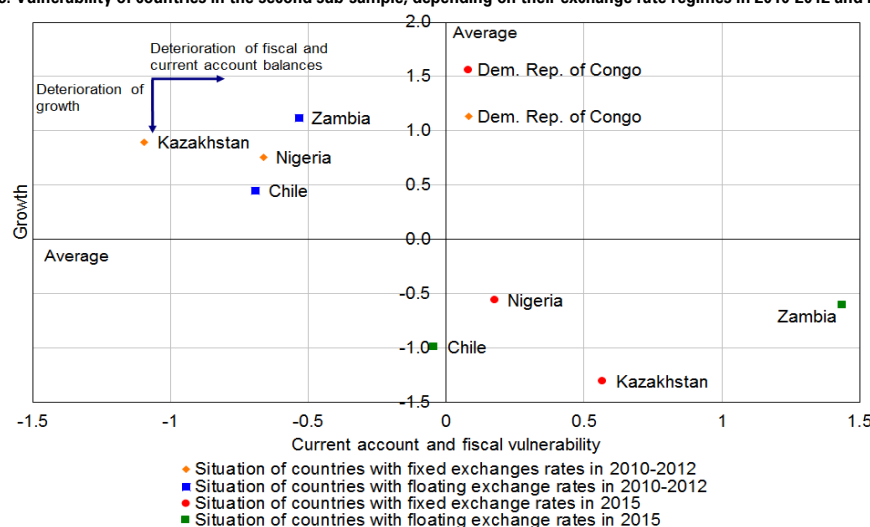
lued in June 2016, after diminishing foreign exchange reserves made the parity unsustainable. Our analysis, which is based on the 2015 data, does not consider the consequences of this devaluation.

Faced with similar shocks, growth slowed slightly more in countries with floating exchange rates, shedding 4 percentage points between 2010-2012 and 2015, compared to countries with fixed exchange rates, which saw growth rates fall by 3 percentage points, with the exception of Kazakhstan, which let its currency float in 2015. The countries with floating exchange rates reacted to low commodity prices by raising their central bank interest rates by 2.5 percentage points to curb imported inflation between the fourth quarter of 2012 and the fourth quarter of 2015, which may have slowed their growth. At the same time, current account balances deteriorated by similar proportions in countries with floating exchange rates, where they worsened by 5.2 points, and countries with fixed exchange rates, where they deteriorated by 5.5

points. On the other hand, government debt in countries with floating exchange rates soared by an average of 19 percentage points of GDP, compared to an increase of 2 percentage points of GDP in countries with fixed exchange rates over the same period. The discrepancy stems from the sharper depreciation of the floating currencies, which lost 45% of their value against the dollar between the fourth quarter of 2012 and the fourth quarter of 2015, whereas countries with fixed exchange rates saw their currencies slide by 24%. Depreciation caused the local-currency value of their outstanding government debt denominated in hard currencies to increase. Such debt represents an average of 74% of government debt in these countries.

These patterns corroborate economic theory: adjustment to low commodity prices seems to carry a smaller cost for countries with fixed exchange rates that do not have diversified economies or that have only a single export, if they have the resources to sustain the fixed parity.

Chart 6: Vulnerability of countries in the second sub-sample, depending on their exchange rate regimes in 2010-2012 and in 2015



Source: DG Trésor.

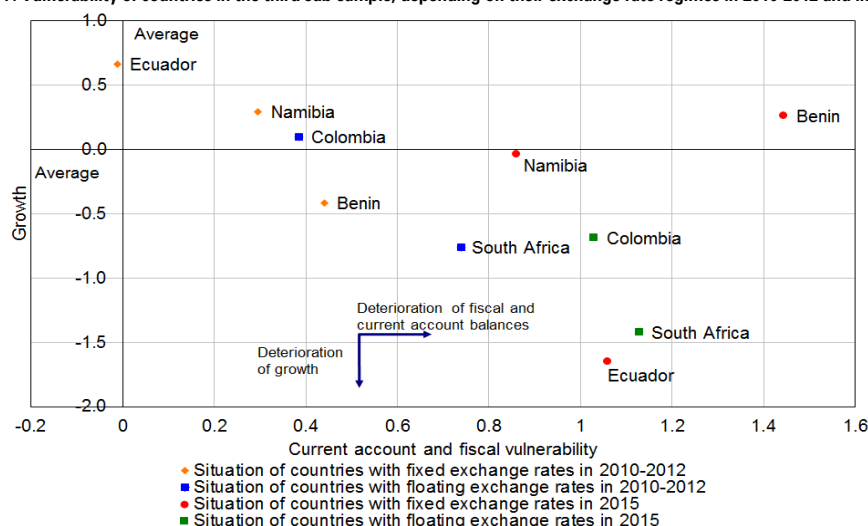
3.3 Focus on a sub-sample of countries having suffered a moderately severe shock, but which already had significant domestic and external imbalances prior to the shock (South Africa, Benin, Colombia, Ecuador, Namibia)

All of the countries in this sub-sample were very vulnerable before the drop in commodity prices, but with fairly diversified economies, where commodities accounted for 60% of their exports on average. This mitigated the shock caused by falling commodity prices, with an average decline in the value of exports equivalent to 5 percentage points of GDP. As was

the case for the previous sub-sample, these countries have different foreign exchange regimes, with floating exchange rates in South Africa and Colombia, and fixed exchange rates for Benin, Ecuador and Namibia.

On average, these countries posted fiscal and current account deficits in 2010-2012, standing at 4% and 2% of GDP respectively. They had relatively low levels of government debt, at 29% of GDP on average and fairly comfortable foreign exchange reserves, standing at 9% of GDP.

Chart 7: Vulnerability of countries in the third sub-sample, depending on their exchange rate regimes in 2010-2012 and in 2015



Source: DG Trésor.

The deepening of the current account and fiscal deficits of countries with floating exchange rates (South Africa, Colombia) was smaller on average than in countries with fixed exchange rates (Benin, Ecuador, Namibia). With shocks of similar severity between 2010-2012 and 2015, the countries with fixed exchange rates saw greater deepening of their fiscal and current account deficits, by 4.3 and 3.4 percentage points of GDP respectively, than the countries with floating exchange rates, where the deficits deepened by 0.5 and 2.5 percentage points of GDP respectively. However, the countries with floating exchange rates saw their government debt increase by 13 percentage points of GDP over the same period, compared to an increase of 10 points for countries with fixed exchange rates. The countries with fixed exchange rates responded to falling commodity prices by drawing on their foreign

exchange reserves in an attempt to maintain their currency pegs. Their reserves fell by 1 percentage point of GDP between the fourth quarter of 2012 and the fourth quarter of 2015. Meanwhile, the countries with floating exchange rates let their currencies depreciate by an average of 37% against the dollar, compared to an average depreciation of 17% for countries with fixed exchange rates. The latter countries also increase their central bank interest rates by 0.6 percentage points on average.

These findings are also consistent with economic theory: countries with more diversified economies and coping with major imbalances will adjust to low commodity prices more readily if they have floating exchange rates.

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