

The price of Brent oil rose by around 70% from June 2017 to May 2018, when it reached nearly \$80 per barrel, the highest level since autumn 2014, although it has fallen in recent weeks to somewhat below \$75 per barrel. This box estimates the macroeconomic impact on various economies of an oil price rise stemming from supply factors and discusses to what extent the size of the estimated effect for Spain may have decreased in the more recent period.

As in any other market, the formation of oil prices is influenced by both demand and supply factors. The supply factors affecting oil prices include possible geopolitical tensions in oil producing areas, producers' strategic behaviour, oil discoveries or new extraction techniques, while demand is determined basically by developments in world activity and, in the longer term, improvements in energy efficiency. Higher oil prices bring negative macroeconomic effects for importing countries, since they entail a transfer of income to producers and reduce the purchasing power of households and firms. However, these effects tend to be more adverse if the oil price rise derives from a supply shock than if it is due to an increase in world demand for this commodity, in which case the lower domestic expenditure can be offset by increased exports.

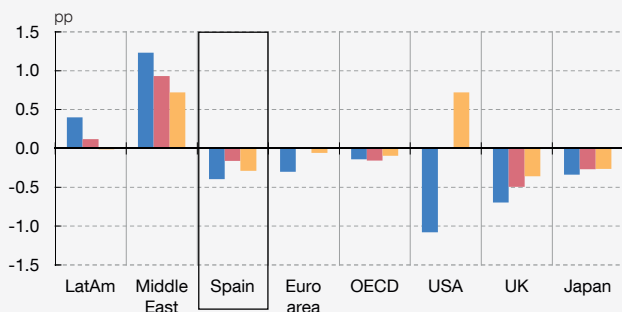
In practice, any analysis of the respective contributions of the supply and demand factors to oil price behaviour is subject to great uncertainty. That said, there is a certain consensus that the rise in the second half of last year was basically in response to an increase in demand generated by a synchronised upturn in economic activity and world trade. However, supply factors seem to have played a larger role in the price rises in the first half of 2018, as a result of the high compliance of agreed cuts among producers, the sharp fall in Venezuelan production and the recent geopolitical tensions exacerbated in recent weeks by the re-imposition of sanctions on Iran by the United States.

Given that the consequences of an oil price rise for oil importers are more severe when the price rise is due to supply factors, and that the evidence points to the increase in the first half of 2018 being predominantly due to such factors, we will focus on the impact of supply-side shocks. For this purpose, we used the NiGEM global macroeconomic model¹ to simulate the effects on

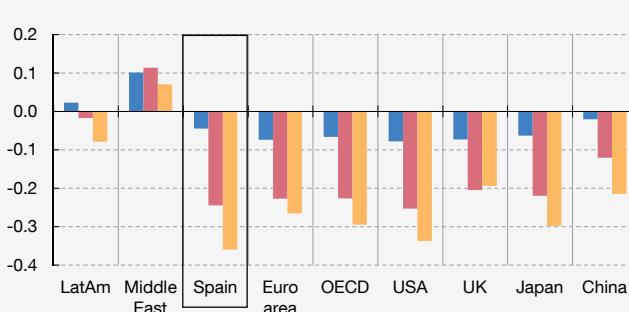
¹ The model is specified as a set of error correction equations in which the dynamics are governed by short-term demand and in which supply subsequently takes on a progressively growing role. The technical assumptions are that nominal exchange rates remain unchanged and expectations are adaptive.

Chart 1
DEVIATIONS FROM THE BASELINE SCENARIO

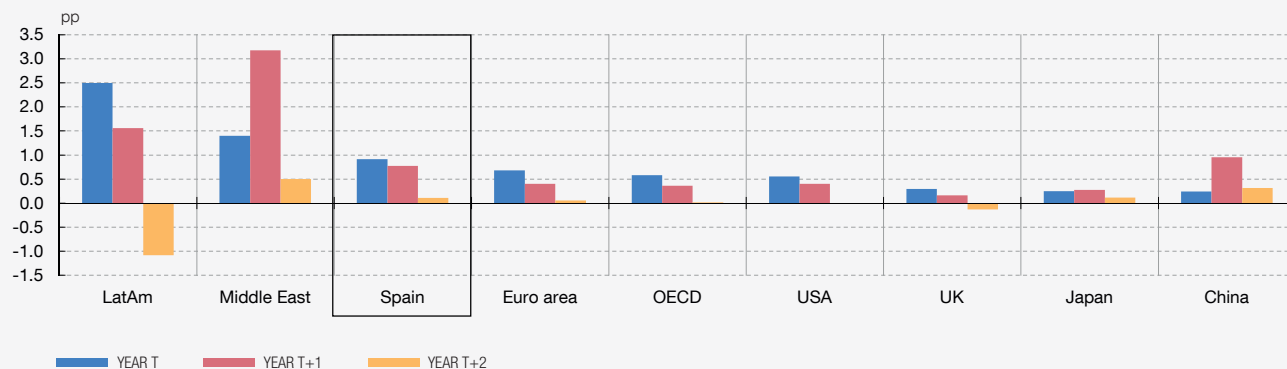
1 CURRENT ACCOUNT BALANCE AS % OF GDP, ANNUAL DEVIATION FROM BASELINE SCENARIO



2 GDP, ANNUAL DEVIATION FROM BASELINE SCENARIO



3 INFLATION, ANNUAL DEVIATION FROM BASELINE SCENARIO



SOURCES: Banco de España and NiGEM.

GDP, consumer prices and the current account balance in various regions of the world that would result from a Brent oil price rise of \$10 per barrel (equivalent to a percentage increase of 15% with respect to a base level of \$65).

The impact is uneven across economies, depending on factors such as producer or importer status, oil derivatives intensity in consumption, tax structure and monetary policy response. As might be expected, the sign of the effects on activity and the external balance is positive in exporting countries and negative in importers (see Chart 1). The impact on inflation is always positive, being more marked in producing countries, since the expansionary effect on domestic demand must be added to the increase in costs, which is also seen in importers.²

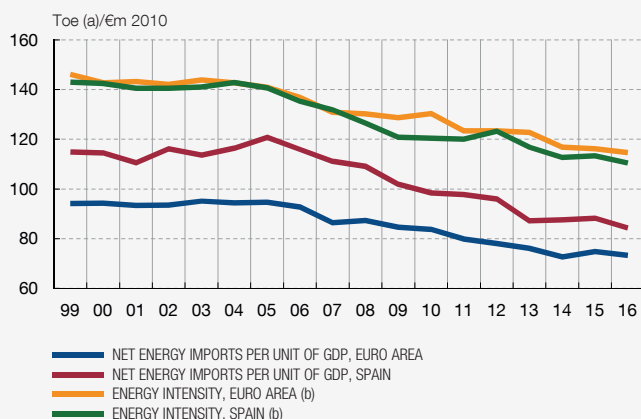
2 The increase in costs tends, however, to be relatively smaller in producing countries, given that the use of oil derivatives is often subsidised.

The impact on the Spanish economy is comparatively large, which is explained by Spain's high import intensity of energy products, especially oil. In particular, Spain's current account balance undergoes a worsening of approximately 0.3 pp of GDP, which moreover shows a high degree of persistence. The estimated loss of GDP in Spain is -0.2 pp on average in the three years following the shock, which is somewhat higher than in other importers, and inflation is estimated to increase somewhat more in Spain (0.9 pp in the first year).

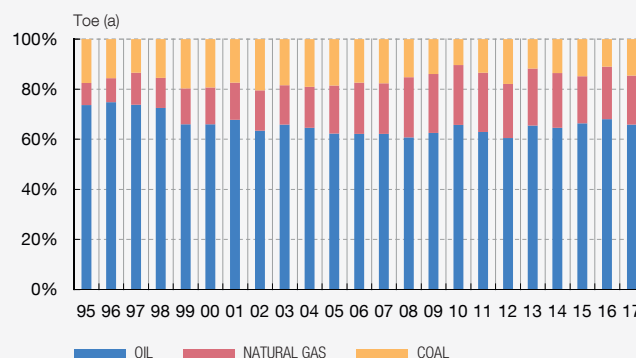
These impacts estimated using the model should be interpreted as an upper bound for two reasons. First, because in practice any oil price rise reflects not only supply but also demand factors. In this respect, simulations performed using the Quarterly Macroeconomic Model of the Banco de España (*Modelo Trimestral del Banco de España*) show somewhat smaller effects, which is consistent with the fact that the estimated elasticities in this model are an average of the effects of all the historically observed supply and demand

Chart 2
ENERGY IMPORTS

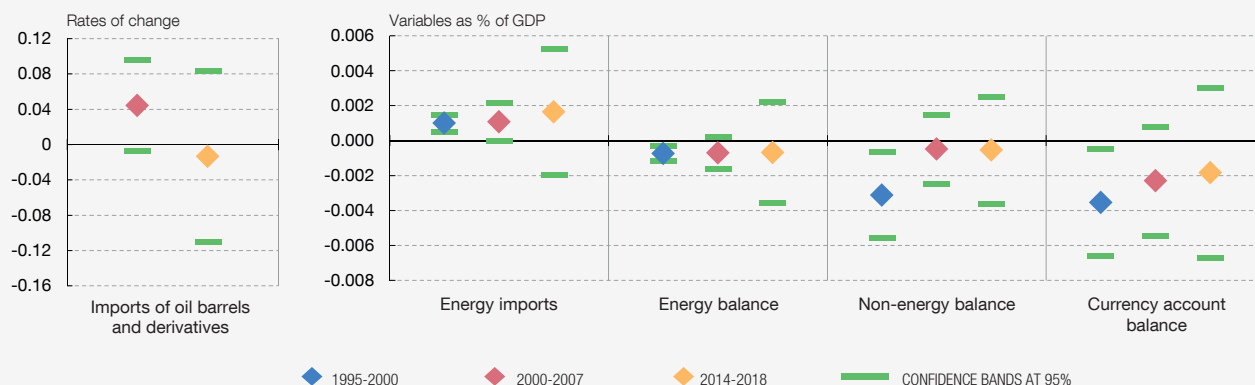
1 NET ENERGY IMPORTS PER UNIT OF GDP AND DEGREE OF ENERGY INTENSITY



2 COMPOSITION OF ENERGY IMPORTS



3 IMPACT OF CHANGE IN OIL PRICES IN EURO



SOURCES: Eurostat and Banco de España.

a Toe = Tonne of oil equivalent.
b Degree of energy intensity = Domestic energy consumption/GDP.

shocks.³ Second, because there is evidence that in recent years importing economies have reduced their oil dependence. Indeed, Chart 2.1 shows that both energy consumption and net energy imports, in both cases per unit of GDP, have been decreasing approximately since 2005 in the euro area as a whole and particularly in Spain, where net imports per unit of GDP nevertheless continue to be comparatively greater. Among the factors explaining this behaviour are the improvement in energy efficiency (driven by technology), the improvements in renewable primary energy sources and the changes in the structure of the economy (particularly tertiarisation).⁴ In addition, although oil continues to be the main source of imported primary energy, its share in the total has been decreasing (see Chart 2.2).⁵

3 Specifically, compared with the figures presented in the exercise conducted using NiGEM, the worsening of the current account balance would be 0.2 pp of GDP (instead of 0.3 pp), the estimated loss of GDP would be somewhat more than 0.1 pp on average in the three years following the shock (instead of 0.2 pp), and the increase in inflation would be 0.6 pp (instead of 0.9 pp). For an evaluation with these elasticities of the role of the oil price fall observed from mid-2014 to end-2015 in explaining the upward surprises in Spanish GDP growth during the period 2014-2016, see Box 1.2 of the 2016 *Annual Report*, 2016, Banco de España.

4 Thus, for example, final energy consumption per unit of value-added in the transport sector, the main user of oil derivatives, has decreased in recent years. Furthermore, this cutback will foreseeably become more marked in coming years as vehicles are more efficient (in 2016 only 21% of the stock of road motor vehicles were less than five years old, while in 2005 this percentage was 42%). Regarding the tertiarisation of the economy, the share of services in the GVA of the economy rose from 67% in 2005 to 74% in 2017.

5 In Spain, this has occurred at the expense of natural gas (see Box 3.1 of Chapter 3 "Current account adjustment", *Annual Report*, 2016, Banco de España).

All these developments are estimated to have contributed to a certain weakening of the negative relationship between oil price movements and the energy trade balance. The main question is whether, in addition, they have reduced the sensitivity of the non-energy balance to oil price fluctuations, given the lower share of oil derivatives in the cost structure of production, an effect which would be magnified by a decrease in the sensitivity of wages to oil price fluctuations in recent years reported in the literature.⁶ If this were so, an oil price rise might be expected to have a somewhat less adverse impact on the economy's external competitiveness than in the past.

Chart 2.3 shows the results of a tentative test of the hypothesis that, over time, the various components of Spain's goods and services balance and its current account balance as a whole have become less sensitive to oil price movements.⁷ In particular, this tool appears to indicate that, while from 1995 to 2000 an increase of 10% in oil prices caused the current account deficit to worsen by between 0.3 pp and 0.4 pp, the effect decreased to 0.2 pp in the period 2014-2018. In any event, this evidence is very preliminary, so it should be regarded with due caution until it is confirmed by further analysis.

6 See Blanchard and Galí (2007), "The macroeconomic effects of oil shocks: why are the 2000s so different from the 1970s?", National Bureau of Economic Research, Working Paper 13368 and, for Spain, Álvarez, Sánchez and Urtasun (2017), "The effect of oil price fluctuations on Spanish inflation", *Economic Bulletin*, 2/2017, Banco de España.

7 Specifically, monthly data and five-year windows are used to estimate bivariate regressions of the various components of the goods and services balance as a ratio of GDP to year-on-year oil price growth.