

BOX 4: GLOBAL OIL PRICE SWINGS: HAS THEIR EFFECT ON MALTA CHANGED OVER TIME?¹

This box aims at providing evidence of the time-varying nature of global oil shocks spillover into the Maltese economy during the period January 2008 to March 2022. The analysis is performed by means of a two-block structural vector autoregression featuring time-varying parameters and stochastic volatility. The results show that periods characterised by the Great Recession and the COVID-19 pandemic were associated with higher inflation and economic activity responsiveness to oil price shocks. Notwithstanding, the response of energy inflation gradually declined because of the energy subsidies implemented by the Maltese government.

Oil price developments and Maltese energy inflation

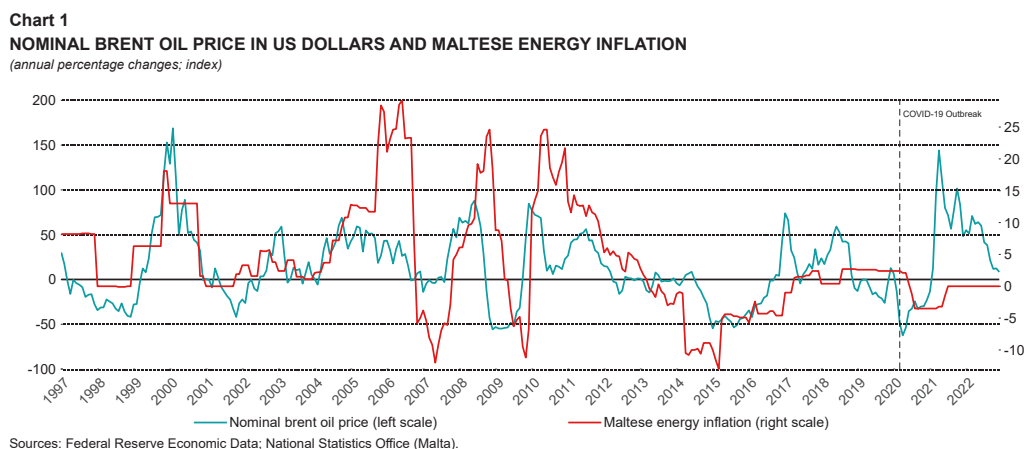
Over the last years, the global economy was hit by several macroeconomic shocks of unusually significant magnitude. Above all, the unexpected outbreak of the COVID-19 pandemic and subsequent economic recovery produced an initial deep contraction, and a subsequent robust rebound in world economic activity. Consequently, the falling and the then rising global economic activity produced large swings in oil prices worldwide, which influenced the speed of economic recovery especially in countries that rely heavily on energy imports.

The developments on the global oil markets are of high importance to Malta mainly because of three peculiarities of its economy. First, Malta is a net-energy importer and has been historically heavily dependent on the import of a variety of fossil fuels, to the extent that almost the entirety of its electricity was produced by heavy fuel oil until 2017, and from liquefied natural gas afterwards. Second, the domestic demand of energy products has been surging because of very high economic growth during the last decade. Finally, retail energy prices in Malta (e.g., fuels, gas, electricity, etc.) are administered by the government which, over several years, has been implementing different pricing policies that led to a different transmission of global prices into domestic retail ones.

The teal line in Chart 1 represents the year-on-year growth rate of nominal Brent oil price expressed in US dollars, while the red shows the annual Maltese energy inflation. The chart illustrates how, given the historically high reliance on heavy fuels, Maltese energy inflation appears to have a high degree of co-movement with the growth rate of the Brent oil price. Furthermore, the chart suggests how such a co-movement has changed over time. Specifically, the period from 1997 to 2001 was characterised by more sporadic price changes than the period that stretches between 2002 and 2015. In particular, the figure shows how during the latter period the government was more reactive in adjusting domestic energy prices to changes in global ones. During the Great Recession, Maltese energy prices showed a tendency to move with oil prices with a lag of a few months. Conversely, the period that goes from 2015 onwards was characterised by more stable domestic energy prices.² More

¹ Prepared by Germano Ruisi, Principal Research Economist of the Economic Research Department at the Central Bank of Malta. The analysis presented in this box is based on the author's study: Ruisi (2023), "[Global oil price: Has their effect on Malta changed over time?](#)", Central Bank of Malta *Working Paper* 04/2023. Helpful comments by Brian Micallef, William Gatt, Massimo Giovannini, Ian Borg and Noel Rapa are gratefully acknowledged. The views expressed are the author's own and do not necessarily reflect the views of the Central Bank of Malta.

² The Malta-Sicily interconnector that became operational in March 2015 as well as the new LNG powerplants together with the fixed-price agreements that effectively hedged the prices of LNG fuel purchased locally have played a remarkable role in stabilising the cost of energy and to effectively reduce the co-movements between local energy prices and Brent oil prices.



strikingly, after the pandemic broke out in early 2020, the government introduced subsidies to the domestic energy producer and distributor of fuels, to shelter the domestic economy from large swings in the global markets. The Maltese government has been keeping retail energy prices fixed since July 2020 with the aim of sustaining the economy through the turbulent pandemic period, the subsequent economic recovery, as well as during the recent developments related to the supply of energy products from Russia.

The time-varying effect of global oil shocks on Maltese output and inflation

The implementation of different energy policies by the Maltese governments over the recent decades raises the need to quantify the changing effect that energy shocks have had on the local economy, both for output and for prices.

The empirical analysis summarised in this box is based on a structural vector autoregressive (SVAR) model with time-varying parameters and stochastic volatility. The SVAR features a Maltese block and a world block. The world block is described by the growth rates of industrial production and overall CPI among all the 38 countries in the Organization for Economic Cooperation and Development, the growth rate of real Brent oil price expressed in US dollars and, finally, the Baltic dry index, the latter being a measure of global shipping costs.³ The Maltese block features the Central Bank of Malta's BCI developed in Ellul (2016) as a measure of output, together with the year-on-year growth rates of the four main sub-indices of the harmonised CPI: food, non-energy industrial goods, energy, and services.⁴

The data are collected at monthly frequency, and the estimation sample runs from January 1997 to March 2022. The overall dataset is split into a training and an effective sample. The training one aims at setting the priors and stretches from January 1997 to December 2007.⁵ The effective sample goes from January 2008 to March 2022, and represents the time span

³ The real price of oil has been calculated as the nominal Brent oil price in USD deflated by the all items CPI for all urban consumers in US cities.

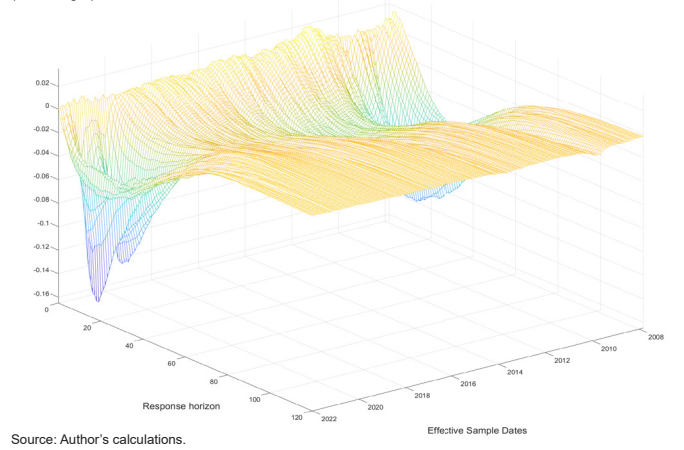
⁴ For more details on the BCI please refer to Ellul, R. (2016) "[A real-time measure of business conditions in Malta](#)", Central Bank of Malta Working Paper 04/2016.

⁵ The monthly data for the Maltese BCI are available only from January 2000 onwards. For this reason, the data ranging from January 1997 to December 1999 are approximated as the standardised quarterly year-on-year growth rate of the real GDP.

in which time-variation in the spillover of the shock of interest is estimated.⁶

Chart 2 depicts the impulse response functions (IRFs) of the Maltese BCI to a one standard deviation shock. Following a global oil price shock, Maltese output experiences downward pressure throughout the 2008-2022 period, but the negative reaction presents two periods of elevated responsiveness: the years following the Great Recession and those following the COVID-19 outbreak.⁷

Chart 2
TIME-VARYING RESPONSE OF MALTESE BCI TO A ONE-STANDARD DEVIATION GLOBAL OIL SHOCK
(unit changes)



Source: Author's calculations.

The experience of 2008-2010 is characterised by more persistent negative responses of Maltese output when compared with the 2020-2022 period. More precisely, after the Great Recession, the median response takes roughly twice as much the time as the pandemic and post-pandemic period to revert to zero. A possible explanation for this phenomenon is the relatively lower tendency for government in the 2008-2010 period to absorb changes in global prices, thus leading to more persistent domestic energy price responses to the identified oil shock during the Great Recession years. Conversely, more recently, the Maltese government has been subsidising the domestic energy producer to keep energy prices fixed as of July 2020, thus dampening the negative impact of surging global energy prices on output. The months between the two recessionary events are characterised by oil shocks depressing economic activity in a much more contained way.

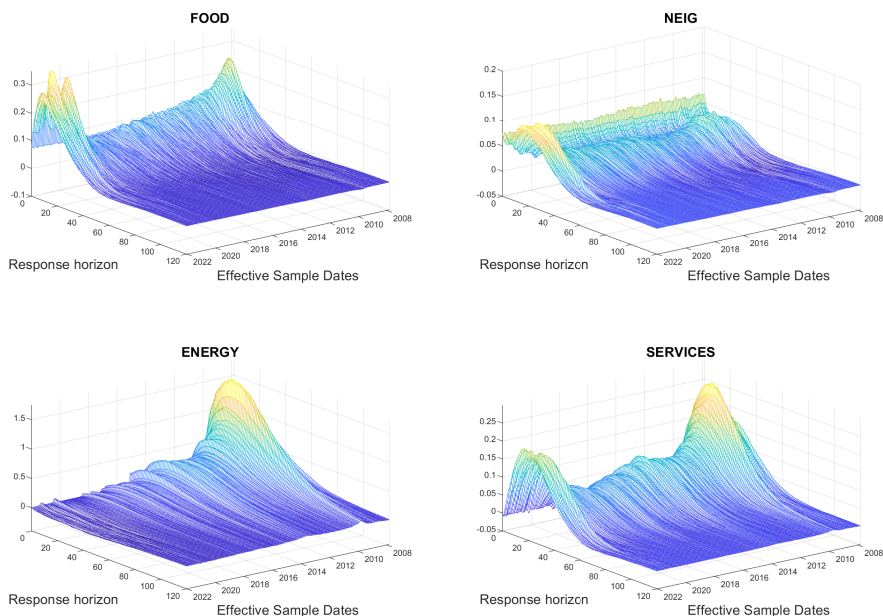
Chart 3 depicts the IRFs of the four HICP sub-indices. Apart from the energy sub-index, all impulse responses show higher responsiveness during and in the immediate aftermath of the Great Recession, as well as after the outbreak of the COVID-19 pandemic.

In the case of food, the model detects a more abrupt rise in the responsiveness experienced in recent years when compared with the beginning of the effective sample. A possible explanation could be found in the relatively high import content of food items in Malta, together with the spike in global food prices that coincided with the oil price shocks that have hit the global economy during the post-pandemic economic recovery.

⁶ The effective sample is set to start on January 2008, as this date marks the entrance of Malta into the eurozone. More details on the model's setup as well as identification strategy are presented in Ruisi (2023), "Global oil price: Has their effect on Malta changed over time?", Central Bank of Malta Working Paper 04/2023.

⁷ The two peaks in the IRF in the recent years refer to the effect of the pandemic outbreak as well as the subsequent reopening of the global economy.

Chart 3
TIME-VARYING RESPONSE OF MALTESE INFLATION SUB-INDICES TO A ONE-STANDARD DEVIATION GLOBAL OIL SHOCK
(unit changes)



Source: Author's calculations.

Non-energy industrial goods have been historically characterised by a similar response throughout the period of analysis. However, a more persistent and hump-shaped response is experienced after the pandemic broke out. This recent and more persistent response could be explained by the fact that most of non-energy industrial goods in Malta are produced outside the national borders and, as such, they are likely to incorporate the recent higher persistence in global energy prices.

Impulse responses for domestic energy inflation show a declining spillover of global oil price shocks. The chart suggests a hump-shaped response during the first part of the estimation sample, thus indicating that the transmission from international to domestic energy prices typically took place with a considerable time lag. Conversely, in more recent years, the response gets increasingly milder. This result reflects the greater role that the government has played in smoothing out global oil price disruptions in the last decade. When the responses are normalised to a 10% rise in real oil price growth, energy inflation receives an upward pressure of 0.5% to 1% over the medium-term until 2017, eventually reaching a zero response afterwards.⁸

Finally, results for services inflation exhibit heightened responsiveness to oil price shocks in the previously mentioned two periods. The peak response of this index of inflation appears less pronounced in 2021-2022, and probably this can be explained by the muted response of energy prices during such a period.

⁸ For further details on normalised responses, please refer to Ruisi (2023), "Global oil price: Has their effect on Malta changed over time?", Central Bank of Malta Working Paper 04/2023. Moreover, cumulated responses are available upon request.

Conclusions

This study finds time-variation in the responses of the Maltese economy to global oil shocks. The shocks lead to negative responses of Maltese output with a recessionary effect having longer-lasting consequences during the 2008-2010 period compared with the 2020-2022 one. Because of the implementation of energy subsidies aiming at sheltering the domestic economy, Maltese energy inflation has become less and less responsive to international oil price shocks. Indeed, a 10% rise in real oil price growth translates into an increase in energy inflation of 0.5% to 1% over the medium-term until 2017. Subsequently, the response declines to virtually zero. Contrary to this, the responses of food, non-energy industrial goods and services inflation rates appear to be more pronounced in conjunction with two periods of higher volatility on global oil markets: the Great Recession as well as the COVID-19 pandemic and the subsequent months.