

THE VALUE OF HOUSING AND ECOLOGICAL DEGRADATION: THE CASE OF THE MAR MENOR¹

The scarcity of past events of materialisation of the physical risks associated with climate change makes it particularly difficult to estimate their costs. At the same time, actions to avoid or mitigate this materialisation, which also have their cost, have to be taken in the present. Consequently, while the cost of acting is known quite accurately (the necessary investment), the benefits (costs avoided when the risk does not materialise) are much more uncertain. One way of increasing certainty consists in analysing the economic impact of environmental disasters that have already occurred; even if these are not a direct consequence of climate change, they share some of the characteristics of those that are. This box offers an example of this type of approximation, focusing on the Mar Menor region of Spain.

The Mar Menor, the largest salt-water lagoon in Europe, located in the region of Murcia, has in recent years experienced a process of degradation known as eutrophication. This process involves an increase in nutrients that leads to abnormal growth of phytoplankton and stimulates the proliferation of algae in the lagoon. This in turn means that not enough light can filter through and, consequently, a large part of the ecosystem has been destroyed since 2015. Decomposition of the resulting dead matter absorbs large quantities of oxygen; on several occasions this has led to large amounts of dead fish washing up on the shore.

According to the report by the Spanish Institute of Oceanography on the evolution and current state of the Mar Menor (2020),² the analysis of 50 years of time series data shows that the chlorophyll levels in the lagoon stood within a range characteristic of a low nutrient system until the phytoplankton proliferation episode of 2015. That year thus marks a turning point in the ecological evolution of the Mar Menor.

Various studies have attempted to measure the economic cost of this environmental catastrophe. Carvalho-Machado Sáez (2020)³, for example, compares Social Security registrations in Mar Menor municipalities with those for neighbouring municipalities, but fails to obtain robust or statistically significant findings. Other studies, in the

political and environmental sciences fields, measure the economic impact using the cost of restoring the lagoon, ignoring the economic costs that the degradation may already be causing.

The aim of this box is to analyse whether this situation is affecting the value of living in the Mar Menor region. If economic activity is generated in the Mar Menor region and it is attractive to tourists or residents the value of this present and future utility will be reflected in the price people are prepared to pay to live in and enjoy this natural environment.

From an analytical viewpoint, it is important to note that the area affected is very specific, the period of time in which the phenomenon commences is clearly defined (2015), and nearby housing with similar characteristics but unaffected by the Mar Menor phenomenon (the Mediterranean coast of south Alicante) can be used as a control group.

The variable to be analysed is the price per square metre of housing sold in the areas of interest. The data are drawn from the Association of Registrars, whose databases cover all housing transactions, with details of the square metres of the properties sold, their prices, etc. The dwellings are grouped according to postcodes, distinguishing between areas affected by the ecological deterioration (Mar Menor) and unaffected areas (south Alicante). Sales of housing in south Alicante are used as the control group because this area borders on the Mar Menor region and is the same distance by car from the cities of Murcia and Madrid. To the south, the Mar Menor region adjoins Cartagena, an area with very different characteristics from the coastal zone that concerns us. As may be seen in Chart 1, the behaviour of the price per square metre in these two areas clearly diverges. The median return on a residential investment made in 2015 in the Mar Menor region would be 0% in 2021, while an investment in south Alicante would have generated a return of more than 43% over the same period.

In order to analyse this difference statistically and confirm whether there has been a significant difference

1 This box draws on the findings of the forthcoming paper “Environmental destruction and Housing Prices: The Case of Mar Menor in Spain” (2021) by María de la Luz García Lorenzo, Javier García Villasur, Matías Lamas and Gabriel Pérez Quirós.

2 See the study by the Spanish Institute of Oceanography (2020).

3 “Socio-economic Impact of Mar Menor Harmful Algal Bloom in 2015-2016.” Caterina Carvalho-Machado Sáez. Universidad Carlos III de Madrid.

THE VALUE OF HOUSING AND ECOLOGICAL DEGRADATION: THE CASE OF THE MAR MENOR (cont'd)

in the behaviour of prices in the Mar Menor area following the ecological deterioration, a differences in differences method is used. This procedure compares, at postcode level, dwellings sold in the Mar Menor area (the affected group) with those sold in south Torrevieja (the unaffected or control group). The working hypothesis is that there were no significant differences in the behaviour of house prices between these two areas before 2015. However, from 2015, the prices of the Mar Menor districts began to lag behind.

The left-hand panel of Chart 2 shows the estimation of the statistical differences between the prices of the two areas over time, taking 2014 as the base year. As can be seen in the chart, there is a negative effect on the evolution of the price of housing sold in the Mar Menor area from 2016. This effect increases up until 2019 and can be quantified as more than €500 per square metre at the end of the sample. Given the initial level of the price per square metre in the Mar Menor area, this approximately amounts to a 45% lower rise in value

compared with housing in south Alicante. The result is consistent with the aggregate data in Chart 1.

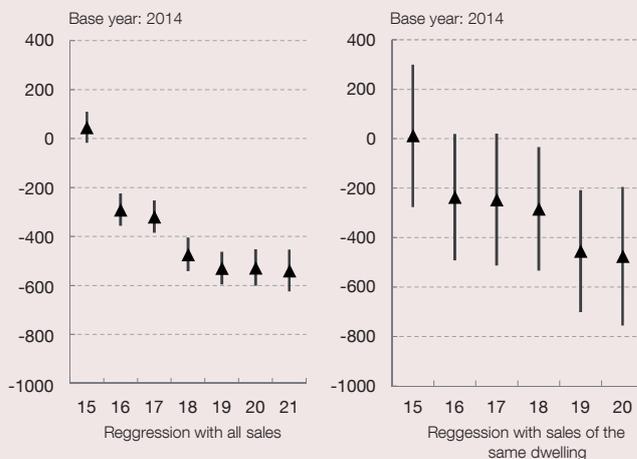
It is important, from a technical point of view, to confirm that this difference in the evolution of prices is not due to a change in the characteristics of the housing sold in these two areas. For this purpose, a sub-sample of the previous estimation is used consisting of dwellings sold at least twice in the period analysed. Comparing transactions involving the same dwellings at earlier and later points in time controls for the possibility that changes in the composition of the housing sold affect the evolution of prices. The results of the estimation of the price differences are presented in the right-hand panel of Chart 2 and are comparable to those in the left-hand panel. This appears to confirm that the impact of the environmental degradation of the Mar Menor may have given rise to a difference in the return on residential investment of 45% over six years.

From the standpoint of financial stability two questions arise in this context. First, the extent of the wealth effect associated with this reduction in the rate of return and, second, the

Chart 1
MEDIAN PRICE PER SQUARE METRE OF HOUSING IN AFFECTED (MURCIA) AND UNAFFECTED (ALICANTE) POSTCODES (a)



Chart 2
ESTIMATED DIFFERENCE BETWEEN THE PRICE PER SQUARE METRE IN AFFECTED (MURCIA) AND UNAFFECTED (ALICANTE) POSTCODES (b)



SOURCE: Colegio de Registradores.

- a The chart compares changes in house prices in postcodes in Murcia affected by the environmental catastrophe in the Mar Menor with those in postcodes in the south of Alicante with similar characteristics.
- b Both panels show the average effect on the price per square metre of a dwelling located in an area affected by the environmental catastrophe (Murcia) rather than in an unaffected but similar area (south of Alicante), taking the period prior to 2015 as the base or reference. To calculate these effects, a regression is carried out in which the price per square metre of the dwellings sold is explained according to whether they are located in one area or the other, also bearing in mind the year in which the transaction took place. The triangles represent the estimated coefficients and the lines the 95% confidence intervals for these estimates. In the left-hand panel, the sample includes all house sales in these areas. In the right-hand panel, only repeat transactions are included (sales of the same dwelling in different time periods). The latter allows changes in prices of the same unit to be assessed, thus controlling for possible changes in the composition of the houses sold over time, but leads to less precise estimates (wider confidence intervals), as the number of observations is reduced. In this panel the year 2021 is excluded owing to a lack of information on repeat transactions.

THE VALUE OF HOUSING AND ECOLOGICAL DEGRADATION: THE CASE OF THE MAR MENOR (cont'd)

consequences it may have on credit standards for loans secured by housing affected by an ecological deterioration of this type. Obviously, if this problem is limited to a very specific area, such as the Mar Menor, then the stability of the Spanish financial system will not be threatened. However, should it extend to a much wider area, which may occur, for example, if the sea level rises significantly as a result of climate change, the consequences may be material.

Answering the first question on the wealth effect requires an estimation of the number of dwellings existing in the affected Mar Menor postcodes. A rough estimate is obtained using information from cadastral statistics. According to the latter, the total number of dwellings in the Mar Menor area in 2021 was 117,000. Given that the median dwelling is 72 square metres and the median price per square metre is €1,095 the total value of the housing is €9,224 million. The failure of the price of these dwellings to rise during the period analysed implies a loss of wealth of €4,150 million, relative to a scenario in which the ecological catastrophe did not occur.

A first approximation to the answer to the second question on credit market conditions is obtained by analysing the

evolution of the median mortgage in both areas. In the Mar Menor area, the median mortgage remained unchanged between 2014 and 2021, at around €60,000. The median mortgage in the south Alicante area increased by more than 100%, from €44,000 in 2014 to a high of more than €90,000 in 2021, which shows the dynamism of one area compared with the stagnation of the other. The findings suggest that an ecological deterioration like the one described has the potential to significantly reduce the value of the available collateral, making access to credit more difficult in the affected areas.

In short, this exercise, which gives a precise estimate of the serious economic impact of the environmental deterioration in the Mar Menor region, seeks to illustrate more generally the importance of the physical risks of climate change for financial stability and, specifically, the wealth of households and the quality of banks' mortgage portfolios. This analysis suggests that, should the materialisation of climate change lead to comparable environmental damage in other areas of the Spanish Levante, the economic damage and its implications for financial stability could be significant.