CONSTRUCTING A NEW ADVERTISED HOUSE PRICE INDEX

Article published in the Quarterly Review 2022:4, pp. 39-42
BOX 1: CONSTRUCTING A NEW ADVERTISED HOUSE PRICE INDEX

Overview

The Central Bank of Malta publishes an advertised house price index, on a quarterly basis, as a supplement to the official contract-based index that is produced by the National Statistics Office (NSO). The Bank’s advertised index is available in annual terms starting from 1980, and in quarterly terms from 2000. The series used to be compiled from listings for residential properties in Malta and Gozo, advertised on print media.

Nonetheless, over time, the number of listings collected from print media declined considerably, reflecting the shift to advertising on online platforms. Indeed, the number of observations reached a peak of over 10,000 listings per annum in 2007 and fell to less than 1,700 observations by 2020 and 2021 (see Chart 1). Therefore, the representativeness of the overall advertised house price index was weakening, as other indicators did not show such a trend decline in property market activity.

Consequently, the Bank launched a project to collect advertised listings from online sources as from the first quarter of 2019. Apart from information regarding the property type and the associated price levels, the dataset also includes several property characteristics which can be useful for more elaborate research on property market trends. The property types collected include apartments shell, apartments finished, maisonettes shell, maisonnets finished, penthouses shell, penthouses finished, terraced houses, town houses, villas, and houses of character.

Between the first quarter of 2019 and the last quarter of 2021, around 60,000 valid listings were collected from online sources (prior to the removal of outliers). This means that an average of 5,000 properties per quarter were collected, almost 10 times the number of listings extracted from print media in the last two years preceding the launch of the project.

1 Prepared by Erica Maria Brincat and Michaela Ghigo, Senior Economists in the Economic Projections and Conjunctural Analysis Department, and in the Fiscal Affairs and Reports Department, respectively, at the Central Bank of Malta. The authors would like to thank Prof. Edward Scicluna, Alexander Demarco, Aaron George Grech, Rita Schenbri, Ian Borg, and Brian Micallef for their helpful comments. The views expressed in this box are those of the authors and do not necessarily reflect those of the Central Bank of Malta. Any errors are the authors’ own.

2 This box summarises the findings and information provided in “Constructing a new Advertised House Index”, Central Bank of Malta, Policy Note (2022).

3 Neither the Bank’s previous advertised index nor the new index are hedonically adjusted.
**Data analysis**

Despite the significant contrast in the number of listings across the two sources, both yield a very similar distribution in terms of property types (see Chart 2). Around two-thirds of properties listed in print media and online sources are apartments. Maisonettes make up another 12% of the distribution while terraced houses and ‘other’ property categories, jointly account for another 25% of the distribution.

In view of their similar composition, relatively similar weights are observed across both data-sets, with a few insignificant variations. The apartments category had an average weight of 62.9% according to the print media-based index, and a weight of 60.7% when using online data. Similarly, the maisonettes category had an average weight of 12.8% using print media, which is slightly above the 11.8% recorded when using the online source. Meanwhile, terraced houses and the ‘other’ sub-component of the index yielded marginally higher average weights when using data extracted from the online source, relative to print media, with the former standing at 4.4% and 23.1%, respectively.

On balance, median and average prices using the online database exceed those collected from print media, with the largest discrepancy observed in the ‘other’ category of the index (see Table 1). Indeed, online listings for this property category show an average price of

![Chart 2](chart2.png)

**Chart 2**

**DISTRIBUTION BY PROPERTY TYPE(1)**

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Online media</th>
<th>Print media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartments</td>
<td>Average: 367</td>
<td>Median: 275</td>
</tr>
<tr>
<td>Maisonettes</td>
<td>Average: 305</td>
<td>Median: 280</td>
</tr>
<tr>
<td>Terraced houses</td>
<td>Average: 625</td>
<td>Median: 585</td>
</tr>
<tr>
<td>Other(2)</td>
<td>Average: 1,054</td>
<td>Median: 659</td>
</tr>
</tbody>
</table>

(1) Data shown are for the period 2019-2021.

(2) The ‘other’ category includes town houses, houses of character and villas.
€1.1 million, significantly above the €735,000 recorded for listings derived on print media. The median price in this category also differs by a considerable (though smaller) margin of €100,000. The largest discrepancy in this category is detected for villas.

**Outlier detection test**

Online sources provide a richer dataset but can also include more outliers than smaller datasets. As a result, outlier detection becomes more difficult and inevitably requires the use of statistical outlier detection techniques. The interquartile range (IQR) was used for the purposes of the new index, to detect and remove outliers.\(^4\) The outlier detection test in each quarter was employed on a 4-quarter rolling window to account for volatility in the data between quarters.

Evaluating the average number of observations per quarter, retrieved listings for apartments reach over 3,000 (see Table 2). This is followed by almost 600 maisonettes and 200 terraced houses per quarter. The ‘other’ category accounts for another 1,100 listings per quarter. Using the IQR outlier detection method, around 5% of apartments are removed from the dataset, followed by another 3.5% from the ‘terraced houses’ category. Furthermore, around 2% of observations are omitted from the maisonettes and ‘other’ categories.

**Additional methodological changes**

With the aim of improving the robustness of the CBM advertised property index, methodological changes were implemented as from the 2019Q1 reference period onward. From this reference period onwards, advertised listings are now being collected solely using online sources. Secondly, outliers are removed using the IQR test. Additionally, the base year for the index was amended to 2015=100 from the previous 2000=100, aligning it with that for the national accounts. Consequently, growth rates for 2019 and later periods were revised. For the period before 2019Q1, the index continues to be based on print media. The index levels for this period were revised due to the rebasing of the index and the use of break adjustment techniques on the new indices for 2019. Break-adjustment techniques were employed to minimize revisions to growth rates between 2000Q1 and 2018Q4.

**Table 2**

<table>
<thead>
<tr>
<th>Type</th>
<th>No Thresholds (number of units)</th>
<th>IQR (number of units)</th>
<th>Outlier corrected dataset (% of total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartments</td>
<td>3,068</td>
<td>2,908</td>
<td>94.8</td>
</tr>
<tr>
<td>Maisonettes</td>
<td>571</td>
<td>561</td>
<td>98.2</td>
</tr>
<tr>
<td>Terraced houses</td>
<td>219</td>
<td>212</td>
<td>96.5</td>
</tr>
<tr>
<td>Other(^2)</td>
<td>1,127</td>
<td>1,105</td>
<td>98.1</td>
</tr>
</tbody>
</table>

Sources: Online media; authors’ calculations.

(1) Data shown are for the period 2019-2021.

(2) The ‘other’ category includes town houses, houses of character and villas.

\(^4\) Alternative outlier detection techniques were tested and gave similar results.
Changes in index dynamics

Chart 3 plots the annual percentage changes in the advertised house prices for the period 2019Q1 to 2021Q4, based on the old methodology and the new methodology. In general, the two series have similar dynamics, but one can note some divergences in certain quarters. Particularly, in the second half of 2021, the two series seem to move in opposite direction (see Chart 3). In fact, by the end of the year, the new index registered a growth rate of 6.7%, following a contraction of 3.3% in the third quarter. By contrast, the index based on print media data fell into negative territory in the fourth quarter of the year, at -3.1%, following an increase of 3.5% in the previous 3-month period.

Taking a full year perspective, in 2020, the index based on print media registered an annual growth rate of 1.7%, with growth picking up to 2.5% in 2021 (see Chart 4). The new index turned marginally negative in 2020 (-1.0%), before recovering to 2.4% in 2021.