The CBCG conducted a regular survey on the real estate prices trend in Podgorica in December 2018. The questions in the questionnaire were related to the qualitative characteristics of apartments (type of heating, internet connection, number of rooms, number of balconies, etc.) with the primary objective of determining the relative impact of these qualitative characteristics on the value of an apartment. Subjective assessment of the value of the apartment was achieved by asking the following question: “Below which price an apartment owner would not sell an apartment at the time of asking the question?” Based on the collected data, a hedonic real estate index that measures the impact of qualitative characteristics of a residential building on the price of that property was obtained.

The calculation of the average price per square meter for December 2018 was based on the sample, which was conducted on a group of 58,296 residential buildings at the following locations: Podgorica 1, Podgorica 2 and Podgorica 3. Based on a random sample of 2,924 housing units, the number of successfully completed survey questionnaires amounted to 400. Therefore, total response to the survey was 13.68%.

The results of the survey showed that the average price of a square meter of real estate units in Podgorica amounted to 988.1 euros, which is a 5.1% annual increase in relation to December 2017.

The analysis of the real estate price series shows that real estate prices ranged between 900 and 1,000 euros between June 2013 and December 2018. However, this year’s data indicate that the subjective price per square meter in Podgorica is converging towards the value of 1,000 euros, indicating that the real estate market is reviving. The average subjective price of a residential unit in both half-year periods of 2018 amounted to 1,020.4 euros per square meter. The real estate prices growth was a result of: a rise in economic activity, increased lending activity of banks, as well as the reduction of lending interest rates. One of the most prominent trends was the narrowing of difference in real estate prices among the locations Podgorica 1, Podgorica 2, and Podgorica 3. Specifically, intensive construction of new housing units along with the increased demand for units on locations that are more remote from the city centre fuelled the price growth to a certain extent.
<table>
<thead>
<tr>
<th>Period</th>
<th>Price, EUR</th>
<th>Chain Index</th>
<th>Base Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 2007</td>
<td>1,697.6</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>March 2008</td>
<td>1,738.3</td>
<td>102.4</td>
<td>102.4</td>
</tr>
<tr>
<td>September 2008</td>
<td>1,525.5</td>
<td>87.8</td>
<td>89.9</td>
</tr>
<tr>
<td>March 2009</td>
<td>1,402.1</td>
<td>91.9</td>
<td>82.6</td>
</tr>
<tr>
<td>September 2009</td>
<td>1,223.1</td>
<td>87.2</td>
<td>72.1</td>
</tr>
<tr>
<td>March 2010</td>
<td>1,128.3</td>
<td>92.2</td>
<td>66.5</td>
</tr>
<tr>
<td>June 2010</td>
<td>1,191.5</td>
<td>105.6</td>
<td>70.2</td>
</tr>
<tr>
<td>September 2010</td>
<td>1,177.1</td>
<td>98.8</td>
<td>69.3</td>
</tr>
<tr>
<td>December 2010</td>
<td>1,185.2</td>
<td>100.7</td>
<td>69.8</td>
</tr>
<tr>
<td>March 2011</td>
<td>1,171.2</td>
<td>98.8</td>
<td>69.0</td>
</tr>
<tr>
<td>June 2011</td>
<td>1,163.0</td>
<td>99.3</td>
<td>68.5</td>
</tr>
<tr>
<td>September 2011</td>
<td>1,174.0</td>
<td>100.9</td>
<td>69.2</td>
</tr>
<tr>
<td>December 2011</td>
<td>1,151.2</td>
<td>98.1</td>
<td>67.8</td>
</tr>
<tr>
<td>January 2012</td>
<td>1,168.3</td>
<td>101.5</td>
<td>69.0</td>
</tr>
<tr>
<td>June 2012</td>
<td>1,179.6</td>
<td>102.5</td>
<td>69.5</td>
</tr>
<tr>
<td>September 2012</td>
<td>1,172.3</td>
<td>99.4</td>
<td>69.1</td>
</tr>
<tr>
<td>December 2012</td>
<td>1,171.6</td>
<td>99.9</td>
<td>69.0</td>
</tr>
<tr>
<td>March 2013</td>
<td>1,169.4</td>
<td>99.9</td>
<td>68.88</td>
</tr>
<tr>
<td>June 2013</td>
<td>1,069.8</td>
<td>91.48</td>
<td>63.10</td>
</tr>
<tr>
<td>March 2014</td>
<td>971.4</td>
<td>90.80</td>
<td>57.22</td>
</tr>
<tr>
<td>September 2014</td>
<td>950</td>
<td>97.8</td>
<td>55.96</td>
</tr>
<tr>
<td>March 2015</td>
<td>920.8</td>
<td>96.9</td>
<td>54.24</td>
</tr>
<tr>
<td>September 2015</td>
<td>939</td>
<td>101.97</td>
<td>55.31</td>
</tr>
<tr>
<td>March 2014</td>
<td>965</td>
<td>102.77</td>
<td>56.84</td>
</tr>
<tr>
<td>June 2017</td>
<td>1,019.9</td>
<td>105.69</td>
<td>60.08</td>
</tr>
<tr>
<td>September 2014</td>
<td>915.6</td>
<td>89.77</td>
<td>53.93</td>
</tr>
<tr>
<td>December 2017</td>
<td>919</td>
<td>100.35</td>
<td>54.12</td>
</tr>
<tr>
<td>March 2014</td>
<td>901</td>
<td>98.11</td>
<td>53.10</td>
</tr>
<tr>
<td>June 2017</td>
<td>950</td>
<td>105.4</td>
<td>55.96</td>
</tr>
<tr>
<td>September 2017</td>
<td>920</td>
<td>96.8</td>
<td>54.2</td>
</tr>
<tr>
<td>December 2017</td>
<td>939.7</td>
<td>102.2</td>
<td>55.35</td>
</tr>
<tr>
<td>June 2017</td>
<td>1,052.7</td>
<td>112</td>
<td>62</td>
</tr>
<tr>
<td>December 2018</td>
<td>988.1</td>
<td>93.86</td>
<td>58.21</td>
</tr>
</tbody>
</table>

Source: CBCG

The observed sample includes 400 housing units from Podgorica, i.e. 157 houses and 243 apartments (Table 8.2). The sample was collected from three zones in Podgorica: 100 residential buildings from Zone 1 and Zone 2, and 200 from Zone 3. The price of individual housing units ranged between 1,785.7 euros/m² at high-end city locations to 291.7 euros/m² at locations further away from the city centre (Stari Aerodrom, Konik, Masline, Tološi, etc.).
Table 8.2

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of observations</th>
<th>Mean value</th>
<th>Standard deviation</th>
<th>Minimum price</th>
<th>Maximum price</th>
</tr>
</thead>
<tbody>
<tr>
<td>The average housing unit price per square meter</td>
<td>400</td>
<td>988.1</td>
<td>212.1</td>
<td>291.7</td>
<td>1,785.7</td>
</tr>
<tr>
<td>The average housing unit price per square meter - house</td>
<td>157</td>
<td>898.3</td>
<td>245.6</td>
<td>291.7</td>
<td>1,785.7</td>
</tr>
<tr>
<td>The average housing unit price per square meter - apartment</td>
<td>243</td>
<td>1,046.1</td>
<td>163.4</td>
<td>468.75</td>
<td>1,500</td>
</tr>
</tbody>
</table>

**Descriptive statistics, sustainability model checks and econometric model results of the hedonic index**

According to collected data, the econometric model which assesses the effect of qualitative characteristics of the housing unit to the price of that unit was made. Graph 8.1 shows the layout of residential unit prices.

In order to achieve a normal formation, the standard errors value required for the application of Ordinary Least Square (OLS) econometric method, the interpretation of results in the form of percentage changes, prices per square meter are made logarithmic. Also, in order to achieve a proper functional form, exceptionally high-value real estate properties are excluded, as well as poor quality data (for instance, errors found when entering qualitative characteristics). This reduced the sample to 366 observations for modelling purposes. The independent variables used were qualitative characteristics related to the type of a residential building (apartment or house), square metres, age, location, floors of residential buildings, as well as the type of heating, number of balconies, number of rooms, available internet connection, telephone connection and parking space.

Table 8.3 indicates that, as measured by the level of statistical significance, the price of a residential building is influenced primarily by the zone in which the building is, the size and age of the building and the number of balconies. The model results indicate that residential buildings in the first zone are more expensive than the ones in the third zone, while in the second zone they are cheaper than in the third zone. Also, on average and after the examination of other factors, the price of a residential unit is significantly higher if it is 5 or 10 years old than if it is over 10 years old. In addition, the results indicate that the price per square meter is more favourable for larger housing units, i.e. the ones over 65m². Housing units that have one or two balconies are more expensive than housing units without 64 Third zone was taken as a base.
balconies. However, more than two balconies do not significantly increase the price per square meter, indicating the nonlinear effect of this qualitative characteristic on the price. Other qualitative characteristics (owning a parking space, type of heating, available internet and telephone connections, as well as the floor of a housing unit) do not have a significant impact on the price.

Table 8.3

<table>
<thead>
<tr>
<th>Variables</th>
<th>Ratio</th>
<th>Standard error</th>
<th>P&gt;t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable: In (price per square metre)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Podgorica 1</td>
<td>0.161***</td>
<td>0.019</td>
<td>0.000</td>
</tr>
<tr>
<td>Podgorica 2</td>
<td>-0.059**</td>
<td>0.026</td>
<td>0.025</td>
</tr>
<tr>
<td>Apartment</td>
<td>0.022</td>
<td>0.034</td>
<td>0.522</td>
</tr>
<tr>
<td>Over 65m²</td>
<td>-0.043*</td>
<td>0.025</td>
<td>0.081</td>
</tr>
<tr>
<td>up to 65m²</td>
<td>-0.041</td>
<td>0.042</td>
<td>0.328</td>
</tr>
<tr>
<td>up to 6 floors</td>
<td>-0.002</td>
<td>0.017</td>
<td>0.908</td>
</tr>
<tr>
<td>up to 5 years old</td>
<td>0.098**</td>
<td>0.045</td>
<td>0.031</td>
</tr>
<tr>
<td>5 to 10 years</td>
<td>0.090***</td>
<td>0.020</td>
<td>0.000</td>
</tr>
<tr>
<td>Balcony 1</td>
<td>0.093***</td>
<td>0.033</td>
<td>0.006</td>
</tr>
<tr>
<td>Balcony 2</td>
<td>0.087**</td>
<td>0.037</td>
<td>0.022</td>
</tr>
<tr>
<td>Balcony 3 plus</td>
<td>0.052</td>
<td>0.047</td>
<td>0.270</td>
</tr>
<tr>
<td>Floor 6</td>
<td>0.000</td>
<td>0.017</td>
<td>0.994</td>
</tr>
<tr>
<td>Room plus2</td>
<td>0.087</td>
<td>0.066</td>
<td>0.183</td>
</tr>
<tr>
<td>Room 1</td>
<td>0.075</td>
<td>0.056</td>
<td>0.180</td>
</tr>
<tr>
<td>Room 2</td>
<td>0.051</td>
<td>0.060</td>
<td>0.404</td>
</tr>
<tr>
<td>Electric heating</td>
<td>0.028</td>
<td>0.023</td>
<td>0.228</td>
</tr>
<tr>
<td>With a parking space</td>
<td>-0.003</td>
<td>0.038</td>
<td>0.944</td>
</tr>
<tr>
<td>Telephone</td>
<td>0.032</td>
<td>0.040</td>
<td>0.432</td>
</tr>
<tr>
<td>Internet</td>
<td>0.029</td>
<td>0.024</td>
<td>0.223</td>
</tr>
<tr>
<td>Constant</td>
<td>6.671</td>
<td>0.059</td>
<td>0.000</td>
</tr>
<tr>
<td>Number of observations</td>
<td>366</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R_squared</td>
<td>0.28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *** significance at 1%, ** significance at 5%, * significance at 10%

In - natural logarithm, msqr - square meters

The model diagnostic tests showed that the model had been specified very well; there were no problems with its multicollinearity (low value of the variance inflation factor - VIF, i.e. below 10) or with the functional form (Ramsey Reset test). The heteroscedasticity issue was corrected using robust standard errors.

The table 8.4 shows the real estate prices trends in selected countries according to the Global Property Guide Report. As can be seen, divergent developments in real estate prices were present in Q4 2018: Malta recorded the highest annual growth (10.48%) while the largest annual decline was recorded in Egypt (19.24%).
### Table 8.4

Real estate prices in selected countries (ranged according to annual growth in Q4 2018)

<table>
<thead>
<tr>
<th>Country</th>
<th>Annual change, Q4 2017, in %</th>
<th>Trend rating</th>
<th>Annual change, Q4 2018, in %</th>
<th>Quarterly change, Q4 2018, in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malta</td>
<td>7.39</td>
<td>↑</td>
<td>10.48</td>
<td>5.70</td>
</tr>
<tr>
<td>Philippines</td>
<td>7.34</td>
<td>↑</td>
<td>9.91</td>
<td>5.55</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>6.92</td>
<td>↑</td>
<td>8.49</td>
<td>2.14</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.79</td>
<td>↑</td>
<td>7.32</td>
<td>0.03</td>
</tr>
<tr>
<td>Chile</td>
<td>6.69</td>
<td>→</td>
<td>6.94</td>
<td>1.88</td>
</tr>
<tr>
<td>Germany</td>
<td>4.45</td>
<td>↑</td>
<td>6.78</td>
<td>1.39</td>
</tr>
<tr>
<td>Ireland</td>
<td>11.68</td>
<td>↓</td>
<td>5.81</td>
<td>0.69</td>
</tr>
<tr>
<td>Portugal</td>
<td>3.03</td>
<td>↑</td>
<td>5.39</td>
<td>2.03</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>2.43</td>
<td>↑</td>
<td>5.27</td>
<td>1.99</td>
</tr>
<tr>
<td>Spain</td>
<td>3.32</td>
<td>↑</td>
<td>5.25</td>
<td>1.34</td>
</tr>
<tr>
<td>Macao</td>
<td>4.93</td>
<td>←</td>
<td>4.40</td>
<td>-1.55</td>
</tr>
<tr>
<td>Thailand</td>
<td>3.16</td>
<td>→</td>
<td>3.58</td>
<td>0.10</td>
</tr>
<tr>
<td>USA (FHFA)*</td>
<td>4.60</td>
<td>↓</td>
<td>3.45</td>
<td>1.17</td>
</tr>
<tr>
<td>Romania</td>
<td>7.30</td>
<td>↓</td>
<td>3.07</td>
<td>1.00</td>
</tr>
<tr>
<td>Iceland</td>
<td>12.89</td>
<td>↓</td>
<td>3.04</td>
<td>-0.29</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.73</td>
<td>↑</td>
<td>2.92</td>
<td>-1.10</td>
</tr>
<tr>
<td>Lithuania (5 cities)</td>
<td>-0.33</td>
<td>↑</td>
<td>2.01</td>
<td>1.37</td>
</tr>
<tr>
<td>Taiwan</td>
<td>0.55</td>
<td>↑</td>
<td>1.92</td>
<td>2.20</td>
</tr>
<tr>
<td>Latvia (Riga)</td>
<td>6.50</td>
<td>↓</td>
<td>1.33</td>
<td>0.20</td>
</tr>
<tr>
<td>Russia Federation</td>
<td>-3.47</td>
<td>↑</td>
<td>0.99</td>
<td>0.72</td>
</tr>
<tr>
<td>Japan (Tokyo)</td>
<td>3.20</td>
<td>↓</td>
<td>0.61</td>
<td>2.19</td>
</tr>
<tr>
<td>Canada</td>
<td>6.92</td>
<td>↓</td>
<td>0.51</td>
<td>-0.73</td>
</tr>
<tr>
<td>Estonia</td>
<td>2.71</td>
<td>↓</td>
<td>0.04</td>
<td>1.06</td>
</tr>
<tr>
<td>New Zealand</td>
<td>4.92</td>
<td>↓</td>
<td>-0.07</td>
<td>0.62</td>
</tr>
<tr>
<td>South Korea</td>
<td>-0.04</td>
<td>←</td>
<td>-0.17</td>
<td>1.50</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.00</td>
<td>←</td>
<td>-0.19</td>
<td>-0.17</td>
</tr>
<tr>
<td>Jersey</td>
<td>0.60</td>
<td>↓</td>
<td>-0.40</td>
<td>0.85</td>
</tr>
<tr>
<td>Finland</td>
<td>0.82</td>
<td>↓</td>
<td>-0.56</td>
<td>-0.48</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>-0.08</td>
<td>←</td>
<td>-0.79</td>
<td>-1.45</td>
</tr>
<tr>
<td>South African Republic</td>
<td>-0.77</td>
<td>←</td>
<td>-0.80</td>
<td>-0.46</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>12.78</td>
<td>↓</td>
<td>-0.92</td>
<td>-8.73</td>
</tr>
<tr>
<td>Norway</td>
<td>-0.60</td>
<td>←</td>
<td>-1.05</td>
<td>-2.70</td>
</tr>
<tr>
<td>Porto Rico</td>
<td>4.36</td>
<td>↓</td>
<td>-1.19</td>
<td>15.15</td>
</tr>
<tr>
<td>Brasil (Sao Paolo)</td>
<td>-1.50</td>
<td>←</td>
<td>-1.89</td>
<td>-0.14</td>
</tr>
<tr>
<td>Qatar</td>
<td>-10.42</td>
<td>↑</td>
<td>-2.24</td>
<td>-0.22</td>
</tr>
<tr>
<td>Switzerland</td>
<td>-1.70</td>
<td>←</td>
<td>-2.56</td>
<td>-0.23</td>
</tr>
<tr>
<td>Israel</td>
<td>2.19</td>
<td>↓</td>
<td>-3.25</td>
<td>-0.78</td>
</tr>
<tr>
<td>North Macedonia</td>
<td>0.78</td>
<td>↓</td>
<td>-3.51</td>
<td>-1.52</td>
</tr>
<tr>
<td>Sweden</td>
<td>5.70</td>
<td>↓</td>
<td>-3.55</td>
<td>-0.19</td>
</tr>
<tr>
<td>People’s Republic of China (Beijing)</td>
<td>-3.32</td>
<td>←</td>
<td>-3.73</td>
<td>-1.00</td>
</tr>
<tr>
<td>Ukraine (Kiev)</td>
<td>-7.97</td>
<td>↑</td>
<td>-6.09</td>
<td>-1.45</td>
</tr>
<tr>
<td>UAE (Dubai)</td>
<td>-5.23</td>
<td>↓</td>
<td>-8.22</td>
<td>-1.98</td>
</tr>
<tr>
<td>Turkey</td>
<td>-0.71</td>
<td>↓</td>
<td>-8.82</td>
<td>0.91</td>
</tr>
<tr>
<td>Egypt</td>
<td>-11.49</td>
<td>↓</td>
<td>-19.24</td>
<td>-16.84</td>
</tr>
</tbody>
</table>

* US Federal Housing Finance Agency

Note:
↑ = more than 1 percentage point increase in real estate prices
→ = less than 1 percentage point increase in real estate prices
↓ = more than 1 percentage point decrease in real estate prices
← = less than 1 percentage point decrease in real estate prices compared to the same period of the previous year

Source: Global Property Guide, December 2018*