



**BANK OF GREECE**

**EUROSYSTEM**

## **Summary methodology for the construction of Commercial Property Price Indices by the Bank of Greece**

**Bank of Greece**

**Economic Analysis and Research Department**

**Real Estate Analysis Section**

[sec.realestate@bankofgreece.gr](mailto:sec.realestate@bankofgreece.gr)

As a follow up to the efforts that started in 2009 in the field of the housing market, the Bank of Greece proceeded with the collection of reliable primary data for monitoring and analysing the commercial property market (office, warehouse, industrial, etc.). Commercial property is defined as property that produces income and comes with certain investment features.

With its commercial property market indices the Bank of Greece seeks to make publicly available **a number of estimates for prices, rents and yields of the main commercial property categories of the Greek market**. For this purpose, the Real Estate Market Analysis Section of the BoG compiles, on a biannual basis, data from the following sources:

- Real Estate Investment Companies (REICs) – Data on investments and yields of commercial property portfolios.
- Credit Institutions – Data on valuations, rents and commercial property transactions.
- Private companies specialized in real estate market consultancy, portfolio management, property development and real estate agencies – Primary data on rents and transactions.

The typical procedure for calculating price indices requires collection and analysis of price data from actual transactions of a good along with the recording of the evolution of its price over time. In the case of the commercial property market, however, this approach has some critical disadvantages. These arise from the heterogeneity that characterises commercial property in terms of quality, location, commerciality, etc. To minimize the effects of these disadvantages, data selection and compilation is based on the criteria of homogeneity of the dataset and exploitation of all information available. Furthermore, data are compiled in a way that economic variables are recorded through time for each property. Note that, due to data restrictions, at the current stage, **the analysis is limited to office and retail uses**, while an expansion of the effort to other uses (e.g. warehouse, logistics etc.) is expected in the near future.

Consequently, the methodology implemented for constructing commercial property price indices is based on “**fixed baskets**” of properties, grouped by use, type of value (rent, price) and submarket (location). Data for the corresponding basket are checked for their completeness (in terms of mandatory fields), compatibility with reporting standards and consistency of variables and information with past records. Before the onset of processing, the data values deviating by more than 2.5\*standard deviation from the average value of the corresponding basket are assumed as outliers and consequently excluded from the dataset. Additionally, values, that for technical reasons are missing, are added by imputation or extrapolation based on the “changing pattern” of the dataset and, where this is not feasible, these observations are excluded either permanently or temporarily.

At the final stage of analysis, calculations are made to determine the effective monthly rent per square metre (m<sup>2</sup>), market value per square metre (m<sup>2</sup>) of main use and yield (in cases where both value and rent are available). Subsequently, **geographical areas (Athens, Thessaloniki and rest of Greece) of reference are finalised, and fixed baskets are formed on the basis of geographical area, use and type of value.** It should be noted that for offices seven submarkets are defined within the wider Athens area. Finally, price and rent indices are estimated on a biannual basis, representing the average change in values both for offices and retail, using 2010 as a base year.

More specifically, the weighted average values  $\bar{x}_{s,t}$  per square metre (m<sup>2</sup>) of all properties within submarket  $s$  over period  $t$ , for the fixed basket  $i$  ( $1, 2, \dots, k$ ), are calculated as follows:

$$\bar{x}_{s,t} = \frac{\sum_{i=1}^k w_i x_{i,t}}{\sum_{i=1}^k w_i}$$

where:

$x_{i,t}$  : the average value of property  $i$  over period  $t$

$w_i$  : the weight of property  $i$  within submarket  $s$

The weighted average of values  $\bar{x}_t$  per m<sup>2</sup> for the whole country over period  $t$ , for all submarkets  $s$ , is calculated as follows:

$$\bar{x}_t = \frac{\sum_{s=1}^s g_s \bar{x}_{s,t}}{\sum_{s=1}^s g_s}$$

where:

$\bar{x}_{s,t}$  : the weighted average value per square meter (m<sup>2</sup>) of all properties within the submarket  $s$ , over period  $t$

$g_s$  : the weight of submarket  $s$

Consequently, based on the methodology described above, the commercial property index (I) for period  $t$  in relation to the base period (year-half)  $0$  is calculated by the equation:

$$I_{0,t} = \frac{\bar{x}_t}{\bar{x}_0} * 100$$