

Methodological notes on short-term indices for monitoring and analysing the Greek real estate market

Bank of Greece
Economic Analysis and Research Department
Real Estate Market Analysis Section
sec.realestate@bankofgreece.gr
Tel. +30 210 320 3837, 2372, 2373

1. INDICES OF HOUSE PRICES (BoG) AND RENTS (ELSTAT.)¹

1.1 House price indices (BoG; new and revised series; quarterly indices)

Since January 2006 the raw statistical data for the compilation of the House Price Index by BoG are collected on a monthly basis from all credit institutions operating in Greece, in the context of the new BoG initiative and the implementation of Bank of Greece Governor's Act 2610/31 October 2008. Detailed data collected for the compilation of these indices stem from the reporting of qualitative and quantitative data on all real estate appraisals conducted by bank engineers for mortgaged properties (within 20 days of the expiry of the reference month).

To estimate house price indices, the BoG Real Estate Market Analysis Section utilises a variation of the mix adjustment approach. These indices are compiled on a quarterly basis, with a 45-day time lag from the end of every quarter. 2007 was selected as the base year, since it is estimated to express a typical situation, without any peculiarities that could affect the compiled indices.

To standardise real estates and define secondary markets comprising real estate groups with – as far as possible – similar characteristics, the multiple stratification technique is used. Specifically, houses are classified in small homogenous groups by location, age and size; the average price (per square metre) is calculated for each group using the geometric mean; these prices are aggregated, after being weighted on the basis of the total transaction value of each group. In more detail, after concretising individual strata, the first step is to estimate analytical indices for each stratum. For a group of homogenous real estates in each stratum, the price index equals the ratio of average prices per square metre. The average price per square meter for the property group of stratum i ($i=1, \dots, n$) for each quarter t is calculated using the geometric mean. In fact, this refers to the calculation of Jevons-type indices, while other sub-indices can be calculated on the basis of different strata, through an appropriate aggregation of strata.²

Thus, the real estate price index for quarter t , as against the basis quarter 0 (if $I_{0,t}$), is given by the formula:

$$I_{0,t} = \frac{\sum_{i=1}^n w_i \frac{p_t^i}{p_0^i}}{\sum_{i=1}^n w_i}$$

¹ ELSTAT: Hellenic Statistical Authority.

² This method is preferred by international literature and Eurostat (Technical manual on owner-occupied housing for Harmonised Index of Consumer Prices, June 2008).

The weights (w_i) used are the ratios of the transaction values of each real estate group of the stratum i to total transactions in the period from the first quarter of 2006 to the current quarter.

All the foregoing, in relation to the methodology used by BoG to compile real estate price indices, can be summarised as follows:

Present methodology

Combined standardization through multiple stratification.

Raw data

- Detailed data on the value and quality characteristics of residential properties underlying loan agreements (based on appraisal reports by competent agencies or associate private engineers).
- Total credit institutions and total estimates for all the regions of the country.

Stratification

Stratification criteria used to identify small homogenous regional markets.

1. Geographical region (50 groups):

Gradual grouping of various regions of the country into broader representative geographical areas. This grouping was based on the postal code of every residential property. Around 1,450 different postal codes were matched with some 800 regions, which were then classified into 50 groups. Through this process, particular emphasis was placed to the degree of urbanity of each region, while the following criteria were also taken into account:

- Geographic proximity;
- Comparable price level;
- Similar price development;
- Adequate number of comments.

2. Property age (2 groups):

- New (0-5 years)
- Old (over 5 years)

3. Property size (3 groups):

- 15-70 m²;
- 70-110 m²;
- over 110 m².

4. Floor:

Given the constant floor-to-floor average change in price (per m²) over time, all estimates of apartment values were converted into first-floor apartment equivalents. Thus, the apartment floor accounted for as a criterion to standardise properties without, however, creating separate subgroups.

The index in series 1.1.a relates to the prices of all apartments throughout the country, on the basis of data collected by banks, while the index is also differentiated by age and geographical area in series 1.1.a1 and 1.1.a2 respectively.

The indices in series 1.1.a1.a and 1.1.a1.b relate to the prices of all apartments, divided into "new" (up to five years) and "old" (over five years) apartments.

Series 1.1.a2.a to 1.1.a2.d provide information about apartment prices per geographical area, divided into Athens, Thessaloniki, other cities (including the capitals of all prefectures and cities whose population is larger than the capital of each prefecture) and other areas. The Athens regions were classified in around 20 homogeneous groups. Other regions of the Attica prefecture ("other Attica") were classified in three groups. The city of Thessaloniki was also divided into three groups. Lastly, capitals cities of prefectures and the other regions of the country (excluding Attica) and, accordingly, "other urban, semi-urban and agricultural areas" were classified in 12 groups.

A distinction is also made in the geographical area index between "new" (up to five years) and "old" (over five years) apartments in series 1.1.a2.1.a to 1.1.a2.1.d ("new" apartments) and 1.1.a2.2.a to 1.1.a2.2.d ("old" apartments), divided into Athens, Thessaloniki, other major cities and other areas, respectively.

It is recalled that, in the past ten years, the Bank of Greece has been publishing a house price index in "other urban areas" (see section 1.2.a2), which relates to a limited number of cities; it is available for the period since the last quarter of 1993 and is compiled on the basis of data collected by its branches, mainly from real estate agencies.

1.2 House price data (BoG; historical series; quarterly indicators)

1.2.a House price data: urban areas

For the period 1997-2005 the House Price Index for all urban areas of the country was compiled by the Real Estate Analysis Section as the weighted average of the next two indices (for Athens and other urban areas or provincial towns). The stock (in m²) of houses in such areas is used as weight.

Since 2006 the index for all urban areas has been compiled on the basis of detailed data collected from all credit institutions of the country.

1.2.b House price data: Athens areas

For the period between January 1997 and December 2005 the raw statistical material for the compilation by BoG of the House Price Index for Athens areas was collected on a monthly basis by a private firm (Property Ltd.). These data were based on ads in the daily press and information from real estate agencies about houses for sale in the broader Athens area. This raw material comprised information per sector (northern, southern, eastern and western suburbs) and area of Athens, both on the price per m² and the offered m² of houses and other buildings. The index for Athens area published in the BoG Economic Conjuncture Bulletin was compiled by the Economic Research Department on the basis of prices in the various areas, weighted according to the volume of houses for sale. Data since 2006 have been originating from detailed data collected from all credit institutions in the context of the new BoG initiative and the implementation of Bank of Greece Governor's Act 2610/31 October 2008, and were presented in detail in the preceding section.

1.2.c House price data: other urban areas (provincial towns)

The raw statistical material for the compilation by BoG of the House Price Index for other urban areas (provincial towns) is collected on a quarterly basis by BoG branches (for 14-19 towns except Athens until recently) and the total index is compiled with population weight by the Regional Economic Conjuncture Section of the Economic Research Department. The raw material is collected by forwarding appropriate questionnaires to real estate agencies and construction firms operating in provincial towns where BoG branches are located. The index has been available since the fourth quarter of 1993 and is still published in the Bulletin of Conjunctural Indicators and the BoG reports with a time lag of about three months from the end of the reference quarter.

1.3 Rent price index (ELSTAT; monthly index)

The rent price index is compiled and published by ELSTAT on a monthly basis for rented houses and constitutes a sub-index of the "HOUSING" category. According to the latest revision of the Consumer Price Index (National CPI³), its weight is 37.28. To improve the reliability of the rent sub-index, the sample of rented houses was expanded in the new CPI, from a sample of 1,300 houses in Athens and Thessaloniki to a stratified sample of 4,500 houses across the country. In this way, the calculation of this sub-index every month is based on the house rent prices of a rolling sub-sample of around 350 rented houses.

1.4 Price-to-rent ratio (BoG; quarterly index; absolute prices)⁴

The price-to-rent ratio (base year 2007 =100) is compiled by the Bank of Greece on a quarterly basis and records changes in rent in comparison with changes in house prices. For the pre-2006 house price index, the house price index for urban areas is used, adjusted for 2007=100. Since 2006 the house price index for the entire country has been used (see 1.1a). For the rent index, the ELSTAT house rent index is used (adjusted for 2007=100; see section 1.3).

2. INDICES OF COMMERCIAL PROPERTY PRICES AND RENTS (BoG)

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

³ For more information about the methodology of the national Consumer Price Index (CPI), see the ELSTAT website at http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p_param=A0515&r_param=DKT87&y_param=2010_04&mytabs=0

⁴ Many analysts use the price-to-rent ratio to estimate the conditions prevailing on the real estate market and draw conclusions about price developments over time. In practice, rents are the gross annual yield of residential investment and, therefore, the development of rents over time also affects house prices. On the other hand, if house prices are high compared with rents, potential buyers would prefer to rent rather than buy a house, thereby exerting downward pressures on house prices and vice versa.

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 (m²), market value per square metre (m²) 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 (m²) 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 m² 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 (m²) 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:

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

3. RESIDENTIAL PROPERTY TRANSACTIONS INDICES

3.1 Residential property transactions indices with MFI intermediation (BoG; quarterly indices)

Residential property transactions indices are compiled by the Bank of Greece on a quarterly basis and refer to the entire country. Transaction indices are based on estimates by engineers of the competent agencies of credit institutions about the value and quality characteristics of residential properties underlying loan agreements granted by credit institutions. Part of these estimates is probably not associated with the purchase and sale of residential properties, but rather relate to the renegotiation of existing loans, registration of security (on properties) for non-housing loans, transfer of customer debts from one bank to another etc.

3.1.a Number of transactions

This index refers to the number of transactions in residential properties made with banking system mediation. In essence, it is the number of appraisals reported to the Real Estate Market Analysis Section of the Bank of Greece by credit institutions, in implementation of Bank of Greece Governor's Act 2610/31 October 2008.

3.1.b Transactions volume index (in square metres)

The transactions volume index is based on the total square metres of residential properties that were the subject of such transactions made with banking system mediation. They are the appraisals comprised in the preceding index 3.1.a.

3.1.c Transactions value index

This index refers to the total value of residential properties transactions made with banking system mediation. They are the appraisals comprised in the preceding index 3.1.a.

3.2 Indices of real estate transactions contracts attended by lawyers from the Athens Bar Association (ABA; quarterly indices)

These indices are compiled by the Bank of Greece on a quarterly basis and relate to the area of Athens. Raw data are collected by the Athens Bar Association.

3.2.a Number of contracts

This index refers to the number of real estate transactions contracts concluded via the Athens Bar Association. The representation of a lawyer is mandatory - for the buyer only - when the value of transaction is over €80,000.

3.2.b Value of contracts

This index refers to the value of such contracts concluded via the Athens Bar Association. The value of transaction is the higher of the value of the contract and the objective value.

3.3 Indices of notarial real estate transactions deeds (ELSTAT; annual indices)

These indices are compiled and published by ELSTAT on an annual basis and comprise all types of properties, irrespective of use or contracting parties (natural person or firm). They refer to houses, stores, plots, fields and other commercial or residential properties and concern the total of Greece country (3.3.a) and the area of Attica (3.3.b).

For the breakdown of notarial deeds by geographical area (region of Court of Appeal or First Instance Court) see the ELSTAT website at

http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p_param=A0602

3.4 Indices of real estate transactions number (Hellenic National Cadastre; quarterly indices)

These indices concern the number of real estate transactions in areas covered by the Hellenic National Cadastre on a quarterly basis; they comprise all types of properties: houses, stores, plots, fields and other commercial or residential properties and concern the total of Greece (3.4.a) and the area of Attica (3.4.b).

3.5 Indices of real estate transfers number (Hellenic National Cadastre; quarterly indices)

These indices concern the number of real estate transfers in areas covered by the Hellenic National Cadastre on a quarterly basis; they comprise all types of properties: houses, stores, plots, fields and other commercial or residential properties and concern the total of Greece (3.5.a) and the area of Attica (3.5.b).

3.6 Number of residential property transfers recorded in the Athens land registry (monthly index)

The index refers to the number of residential property transfers recorded in the Athens land registry for the areas of the Municipality of Athens (up to Kifissou Avenue), Galatsi, Neos Kosmos, Petralona, Moschato and part of Kamatero.

4. CONSTRUCTION COSTS INDICES (for new buildings) (ELSTAT)

4.1 Total construction costs index for new buildings (quarterly index)

This index refers to the evolution of costs incurred by the constructor of a relatively "standardised" building (apartment building) and is calculated on the basis of prices paid for material, labour and other expenses. It records the historical change in prices of inflows for the construction of new residential buildings and comprises the following two price sub-indices:

- i) Index of Material Cost for the Construction of New Residential Buildings;
- ii) Index of Labour Prices or Labour Cost for the Construction of New Residential Buildings.

The table presents the weights for the base year (2005=100) for the compilation of the construction costs price index for new residential buildings. The weights of the Total Cost Index for the base year 2005 were calculated on the basis of the corresponding weights of the previous base year 2000, which resulted from an ad hoc structural survey of construction enterprises.

CONSTRUCTION COSTS PRICE INDEX FOR RESIDENTIAL BUILDINGS		
Code	Name	2005 weight
44612	Total cost index	100.00
14612	Material cost index	56.71
24612	Labour cost index	43.29

For more information about the methodology of this index, visit the ELSTAT website at http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p_param=A1399&r_param=DKT63&y_param=MT&mytabs=0

4.2 Work or producer category price index (quarterly index)

This index refers to the various segments of the construction of new residential buildings (e.g. concrete, brickwork, coatings) and is calculated on the basis of the prices paid to contractors-constructors for the construction of various segments.

The values of the price index of work categories collected by ELSTAT, come from technical construction firms and contractors. The geographical coverage of the index is the entire country, although prices are taken in larger urban centres of the country (Region of the Capital, Thessaloniki, Patras, Volos, Larissa and Heraklio). The price index of work categories follows changes in the prices of 30 categories of works grouped in 17 groups, with price data recorded from 509 price recording sources.

WORK CATEGORIES PRICE INDEX		
Code	Name	2005 weight
461201	Earthworks	1.88
461202	Concrete reinforced or not	30.16
461203	Wall-building	7.04
461204	Plastering	8.47
461205	Electrical installations	3.4
461206	Hydraulic installations	5.27
461207	Central heating installations	4.46
461208	Coverings - Coatings	12.24
461209	Carpentry	7.3
461210	Iron constructions	2.87
461211	Aluminum constructions	4.87
461212	Painting	6.05
461213	Insulation	1.6
461214	Glazing	1.02
461215	Elevators	1.98
461216	Plaster structures	0.53
461217	Special installations without devices and parts	0.86

Prices cover the costs of materials, the costs of labour, the depreciation of fixed capital and profit. Since agreements on the construction of segments of buildings are made on the basis of remuneration per work unit, prices refer to work units, such as m², m³, piece etc., depending on the type of work. Prices are collected by ELSTAT on a quarterly basis and refer to all prices on which agreements were made within the reference quarter.

The base year was 2005. The weights of the Work Categories Price Index for the base year 2005 were calculated on the basis of the corresponding weights of the previous base year 2000, which resulted from an ad hoc corrective construction firms survey.

For more information about the methodology of this index, visit the ELSTAT website at http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p_param=A1399&r_param=DKT63&y_param=MT&mytabs=0

4.3 Labour costs price index (quarterly index)

Since labour makes a substantial contribution to total inflows and constitutes a decisive factor of the construction costs of new residential buildings, measuring the change in labour costs is very useful to the planning of construction of any new building (apartment

building). The objective of this index is to measure changes in labour costs for the construction of new residential buildings over time.

Labour cost prices in the total construction costs index for new residential buildings are the prices actually paid by construction firms to the technicians they use. Since labour costs are usually agreed between the construction firm and the technicians of a specific speciality per work unit (direct labour), piecework prices are used, as collected quarterly and reported in the agreements made during the reference month.

The prices for the labour costs price index originate from technical construction firms and contractors. The index covers the entire country, noting that prices are taken only in major urban centres (Athens area, Thessaloniki, Patras, Volos, Larissa and Heraklio). The labour costs price index monitors changes in the prices of 24 work categories, grouped in 11 groups, the price data being recorded from 420 price sources.

According to the speciality required for each work, inflow data for "labour costs", after their revision, were classified in 11 work groups (earthworks, reinforced and non-reinforced concrete, brickwork, coatings, electrical installations, plumping work, central heating installations, laying-tiling, paints, insulation, plaster work), for which respective quarterly indices are compiled. The base period for price comparison was 2005. The weights of the price index of labour costs for the base year 2005 were calculated on the basis of the corresponding weights of the previous base year (2000), stemming from an ad hoc corrective survey of construction firms.

For more details on the methodology of this index, see the ELSTAT website:

http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p_param=A1399&r_param=DKT63&y_param=MT&mytabs=0

4.4 Costs of material index (monthly index)

This index, in its general form, expresses changes in the price of construction materials, comprised in the actual inflow "consumed materials", the data of which were classified, as regards physical characteristics, in the following groups of homogenous materials, for which an equal number of monthly price indices are compiled in base year 2005. The weights for base year 2005 were calculated on the basis of the corresponding weights of the previous base year (2000), stemming from an ad hoc corrective survey of construction firms.⁵

	Groups of homogenous materials	2005 weights
1	Cement and ready-mixed concrete	18.6
2	Natural stone	1.94
3	Marble products	4.25
4	Artificial stone	5.23
5	Wood and wood products	16.64
6	Metallic material for basic processing	22.59
7	Plumping, heating, sewage materials	7.42
8	Door and window fittings	2.16
9	Electrical equipment	4.74
10	Glass products	1.96

⁵ Expenditure data of about 110 construction firms were used to calculate the weights of the index.

11	Paints and varnishes	3.08
12	Tiles, bathroom materials	5.32
13	Insulation materials	1.17
14	Elevators	3.36
15	Machinery fuel (diesel), electricity, water	1.54

For more information about the methodology of this index, visit the ELSTAT website at: http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p_param=A0511&r_param=DKT60&y_param=MT&mytabs=0

5. PRIVATE CONSTRUCTION ACTIVITY (ELSTAT; monthly indices)

As regards the supply of new buildings, the volume of private construction activity – without distinguishing between residential and other buildings – as recorded and published by ELSTAT on the basis of new construction permits, provides very useful information. Data are inventory data and refer, for every month, to total construction permits issued by the country's urban planning offices and not to completed buildings. The urban planning offices record the type of construction, the type of building, the particulars of the building and other auxiliary areas, the type of use of the building, the floor space, the volume and the budget.

For more information (tables, questionnaires, methodology) about the Construction Activity Survey, visit the ELSTAT website, link: Statistical Issues ==> Construction-Buildings ==> Construction ==> Construction Activity, or go directly to: http://www.statistics.gr/portal/page/portal/ESYE/PAGE-themes?p_param=A1302&r_param=SOP03&y_param=MT&mytabs=0

5.1 Private construction activity index in all of Greece

5.1.a Private construction activity index – number of building permits in all of Greece

This index records construction permits issued by administrative authorities (urban planning offices). Construction permits refer to new buildings or additions only and not to all types of construction permits⁶ and to permits recorded in the relevant questionnaire, as well as the floor space and volume of the building, as recorded in the ELSTAT press releases (a small number of permits for which there is inadequate information has been excluded from the calculation of the number of permits).

5.1.b Private construction activity index – floor space in all of Greece (in thousand m²)

This index records the floor space of buildings in thousand m². The floor space of a building is the sum of the space of all floors, measured up to the external aspect of external walls, as well as other auxiliary areas, as recorded by ELSTAT on the basis of the construction activity survey.

⁶ All types of construction permits recorded by the ELSTAT survey are: for new building or addition, repair, restoration, demolition, walling, legalisation, revision and amendment to buildings.

5.1.c Private construction activity index – volume in all of Greece (in thousand m³)

This index records the volume of buildings in thousand m³. The volume of a building is the gross construction volume, i.e. the space between the external surface, the external walls, the lowest floor (basement, if any, or ground floor) and the roof of the building. If there is an open space between the lowest floor and the roof of the building, its volume is included in the total volume of other areas. The volume of the building is calculated when the permit is issued by the competent urban planning authorities.

5.2 Private construction activity index in Athens

This index records the size of private construction activity in Athens. Indices 5.2.a, 5.2.b and 5.2.c for Athens correspond to indices 5.1.a, 5.1.b and 5.1.c for all of Greece.

6. CONSTRUCTION ACTIVITY

6.1 Cement production index (volume; ELSTAT; monthly index)

It refers to the volume of cement production in construction (in thousand tonnes), as recorded by the ELSTAT.

6.2 Public investment programme disbursements (in euro; Bank of Greece; monthly index)

It refers to disbursements under the public investment programme (public investment programme; amounts in euro; current prices), as recorded in Bank of Greece data.

6.3 Production in construction indices (ELSTAT; quarterly index)

The short-term quarter-on-quarter production indices in construction – the Production Index in Construction, the Production Index of Building Construction and the Production Index of Civil Engineering – are compiled by the ELSTAT. The base year for these indicators was 2000, when they were first compiled by the ELSTAT, but were recently rebased to 2005=100, in the context of Council Regulation (EC) No 1165/98 “concerning short term statistics”, and Regulation No 1158/05 of the European Parliament and the Council amending and supplementing the original Regulation 1165/98.⁷

It should be noted that Production Index in Construction data are not comparable to Construction Activity Survey data (private and public). This because data from the Construction Activity Survey comes from administrative sources (departments of urban planning) and refers to total building permits issued (new buildings, extensions, modifications, etc.), rather than completed buildings. By contrast, Production Index in Construction data comes directly from surveys conducted among some the largest construction firms, and refers to realised construction (building construction, civil engineering construction).

⁷ This revision saw the establishment of the new statistical classification of economic activities NACE Rev.2 (Regulation No 1893/2006 of the European Parliament and of the Council), as well as the establishment of a new statistical classification of products by activity – CPA 2008 (Regulation 451/2008 of the European Parliament and of the Council).

According to ELSTAT, the purpose of the new production indices in construction covering the whole country is to measure changes in production volume for construction, buildings and civil engineering projects at factor cost of production. The Construction of Buildings index includes the costs of demolition, site preparation, general construction activities and installation work. Building construction includes one- and two-dwelling buildings, multi-dwelling buildings, hotels, office buildings, industrial and commercial premises, public entertainment and education buildings, hospitals and other residential buildings. To compile these indices, the ELSTAT surveys a sample of 250 enterprises out of a total of 1,200 construction firms. The compiled time series for these indices cover the period from 2000 onwards, and are either adjusted or not adjusted for the actual number of working days.

To deal with the discontinuity observed between the new (2005=100) and the previous (2000=100) time series of the Production Index in Construction, due to different classifications (NACE, CPA), a backcasting of previous time series was conducted, up to and including December 2008, as per Commission Regulation (EC) No. 472/2008. The revised Production Index in Construction time series (2005=100) comprises both the adjusted (2000-2004) and the new indices (from 2005 onwards), which have been compiled on the basis of new turnover data and weights.

The Production Index in Construction provides a measure of the volume trend in value added at factor cost of production in any given reference period. The aims and characteristics of the Production Index in Construction also apply to the indices that distinguish between building construction and civil engineering sectors.

For more information see also the ELSTAT website: http://www.statistics.gr/portal/page/portal/ESYE/BUCKET/A0511/Other/A0511_DKT66_M T_QQ_01_2009_04_2009_01_F_EN.pdf.

6.3.a Production indices in construction – General Index

It refers to the General Index of Production in Construction, as recorded by the ELSTAT. Data is adjusted for the actual number of working days.

6.3.b Production indices in construction – Building Construction

Data is adjusted for the actual number of working days. According to ELSTAT, the Construction of Buildings index includes the costs of demolition, site preparation, general construction activities and project completion. Building construction includes one- and two-dwelling buildings, multi-dwelling buildings, hotels, office buildings, industrial and commercial premises, public entertainment and education buildings, hospitals and other residential buildings.

6.3.c Production indices in construction – Civil Engineering Construction

The Production Index of Civil Engineering includes the construction value of motorways, roads, streets, airports, sport facilities, bridges, tunnels, subways, oil and natural gas pipelines, electricity generation and distribution networks, telecommunications networks, water engineering projects, seaports, etc. Data is adjusted for the actual number of working days by the ELSTAT.

6.4 Civil engineer fees (TCG; monthly index)

Data collected by the Technical Chamber of Greece (TEE-TCG) as per the obligation of civil engineers – who supervise building construction (see Section 6.4.c) or issue construction permits (see Section 6.4.b) – to pay the TCG a 2% share of their fees, as determined on the basis of a special objective value system (minimum construction costs, etc.). The fee is deposited to TCG authorised banks and the respective city planning departments check the relevant supporting documents, in accordance with applicable provisions and pursuant to the relevant Ministry of Environment, Energy and Climate Change Circular of 20 May 2008.

Also see <http://portal.tee.gr/portal/page/portal/TEE/MyTEE/amoibes> [in Greek only].

6.4.a Civil engineer fees – Total

It refers to total civil engineer fees (building permit issuance and construction supervision fees). This index is broken down into the two sub-indices 5.4.b and 5.4.c.

6.4.b Civil engineer fees – Building permit fees

It refers to civil engineer fees to issue building permits.

5.4.c Civil engineer fees – Construction supervision fees

It refers to civil engineer fees to supervise new construction.

7. EMPLOYMENT IN CONSTRUCTION (ELSTAT, LABOUR FORCE SURVEY - LFS)

The ELSTAT has released the Labour Force Survey results since 1998 on a quarterly basis (in the past, only in the second quarter of the year). The survey covers all persons in private households residing or intending to reside in Greece for at least a year. The survey does not cover persons that are permanent residents in collective residences, i.e. hospitals, hotels, institutional households, old-people's homes, orphanages, etc. In terms of geography, the survey covers all the NUTS III regions (municipalities) of Greece, excluding the Mount Athos monasterial community.

The main purpose of the Labour Force Survey is to collect analytical employment and unemployment data for household members aged 15 years or over.

Specifically, the objectives pursued are as follows: First, to record in detail the employment status of household members aged 15 years or over, combined with gender, age, and level of education in individual regions and the country as a whole. Second, to study the labour force structure (employed, unemployed) by sector of economic activity, occupational group, job, working hours, etc. Third, to monitor the duration of unemployment, together with gender, age, level of education, region and certain characteristics of the last job of each employee, such as sector of economic activity and occupational group. Fourth, to observe the employment status of household members a year earlier, the existence or not of a second job, etc.

7.1 Total employed persons (ELSTAT; quarterly indices)

Employment in construction is broken down into the following four categories (based on the employee's job) which, according to ELSTAT, are defined as follows:

7.1.a Self-employed employers

The self-employed employers are persons working in their own company or as freelancers working for profit or gain, which employ at least one person.

7.1.b Own-account self-employed

The own-account self-employed are persons working in their own company or freelancers working for profit or gain, which have no employees.

7.1.c Employees

Employees are defined as persons who work for a public or private employer and who receive compensation in the form of wages, salaries, payment by results, or payment in kind.

7.1.d Family workers

Family members working for a family business are defined as the family members helping each other in the operation of a family business, on the condition that they are not classified as employees (they receive no compensation and they have no immediate gain from the business).

8. CONSTRUCTION PROJECTS DATA (IKA)

The IKA publishes data on employment in construction on its website on a monthly basis, which stems from processing the "Analytical Periodic Report" (APD). In particular, the data published concern the number of construction projects, the number of insured construction workers, the average days worked per month, and the average wage.

8.1 Number of construction projects

It refers to the number of unique construction projects, i.e. if the same project is declared in different IKA branches, it is counted only once.

8.2 Number of insured workers

It refers to the number of insured workers, which does not equal the total number of workers insured with the IKA-ETAM, but only those included in the "Analytical Periodic Report", that have been cross-checked on the data processing date.

8.3 Average days worked per month

It refers to the average days worked per month (actual working days) for each job, not including total days worked in multiple projects.

8.4 Average wage of insured workers

It refers to average wages of workers per employment (not including total employment in case of multiple jobs). Actual working days were used to calculate the average wage. Salaries do not include bonuses and overtime work.

9. INVESTMENT IN CONSTRUCTION AND CAPITAL INFLOWS

9.1 Investment in construction (ELSTAT; quarterly indices)

The ELSTAT releases **quarterly** national account data concerning estimates of the main macroeconomic aggregates, including investment. The investment in construction index is given at constant prices and broken down into:

- Total construction (index 9.1.a)
- Dwellings (index 9.1.b)

9.2 Investment in construction as a percentage of GDP (quarterly indices)

The indices refer to investment in construction as a percentage of GDP; they are given at constant prices and broken down as in paragraph 8.1 into total construction (index 9.2.a) and dwellings (index 9.2.b)

9.3 Net capital inflows from abroad for the purchase of real estate in Greece (BoG; monthly index)

Net capital inflows from abroad for the purchase of real estate property in Greece is a sub-category of direct investment, which records financial flows between businesses, residents and non-residents as direct investment. A direct investment relationship is created when a Greek enterprise (direct investor) owns 10% or more of the share capital of a non-resident enterprise (direct investment enterprise) or, inversely, when a non-resident enterprise (direct investor) owns at least 10% of the share capital of a Greek enterprise (direct investment enterprise). Real estate transactions exclude the purchase of real estate abroad by the Greek government, or the purchase of real estate in Greece by foreign governments and international organisations, which are recorded under public services. Direct investment is analysed by country (of origin/destination of the direct investment) and by sector of economic activity. The economic activity sector also includes natural persons which mostly deal with the purchase and sale of real estate. For more information about direct investment see BoG website:

<http://www.bankofgreece.gr/Pages/en/Statistics/externalsector/balance/transactions.aspx>

10. CONSTRUCTION EXPECTATIONS (IOBE; monthly indices)

The Foundation for Economic and Industrial Research (IOBE) has compiled the quarterly construction expectations index since 1990. Since 1998, **monthly** business surveys have been conducted for the compilation of business expectations indices in industry,

services, retail trade and construction. The survey results are used to calculate the economic sentiment indicator at a European level and are summarised in European Union publications⁸.

According to the EC harmonised programme of business and consumer surveys, the sample size for Greece is 440 businesses and is representative of conditions in construction, the Greek economy and the Greek population as against the other EU Member States. The questionnaires are addressed to senior managers, and the survey is carried out during the first 2-3 weeks of the month; data is then delivered to the responsible European Commission services four working days before the end of the month.

The questionnaire consists of two sets of questions. The first set comprises five questions, which are the same as those used in the services survey. They refer to:

- the past development of the business situation;
- past and expected demand developments; and
- past and expected employment developments.

The second set of ten questions is part of the questionnaire once a quarter, i.e. the first monthly survey of each quarter. The quarterly questions refer to past and future assessments of the operating income, operating expenses, profitability, capital expenditure, and competitive position in the construction sector.

As regards the survey questionnaire, there are three different answer categories:

- increase/improve;
- remained unchanged; and
- decrease/deteriorate.

Replies are first weighted by company size. Then, at the EU level, replies are weighted according to two more variables: the size of the sector in which the company is active (e.g. construction) and the relative size of the country. Specifically in construction, replies are also weighted by the share of each company in private construction, other private construction, other buildings and public works (the latter also includes public housing).

The distribution of the various answer categories is used to aggregate the results in the form of net balances for each question. These balance series (measured as percentage points of total answers) are the difference between the share of positive and negative answering options.

The business expectations index in construction is calculated as the arithmetic average of the balances (in percentage points) of the answers to the questions on order books and employment expectations. The balances are seasonally adjusted.

The monthly results of the IOBE survey are published on the last working day of each month in a press release and are based on primary, analytical data collected by the said business surveys. For more information on the IOBE survey see the European Commission website (European Commission - Economic and Financial Affairs): http://ec.europa.eu/economy_finance/db_indicators/surveys/method_guides/index_en.htm

For more information on the questionnaire used by the European Commission and the IOBE, see the European Commission website (European Commission - Economic and Financial Affairs) concerning the Joint Harmonised EU Programme of Business and Consumer Surveys:

http://ec.europa.eu/economy_finance/db_indicators/surveys/documents/userguide_en.pdf, specifically Annex 5, to find a) the questionnaire (Section 5.1); b) the starting date of confidence indicators by country (Section 5.2), and the respective classification of different subsectors, such as private construction, public works, etc. (Section 5.3).

⁸ Monthly survey conducted by the IOBE at national level pursuant to the Joint Harmonised EU Programme of Business and Consumer Surveys of the European Commission (EC), managed by the Directorate-General of Economic and Financial Affairs (DG ECFIN).

Business expectations in construction included in the summary table presenting key short-term indicators for the real estate market are broken down into:

- a. Total construction
- b. Dwellings
- c. Other buildings
- d. Public works

10.1 Construction confidence indicator

The construction confidence indicator is calculated on the basis of planned future activity estimates (weighted percentage balances) and construction firms' employment expectations.⁹ It consists of the updated IOBE index for 1996-2006, which covers both dwellings and other private and public construction.¹⁰ Data is seasonally adjusted.

10.2 Months of assured production in construction

This refers to months of assured production in construction (in absolute terms).

10.3 Activity relative to previous quarter

It refers to activity relative to the previous quarter as a weighted percentage balance of positive and negative answers.

10.4 Planned future activity

It refers to planned future works as a weighted percentage balance of positive and negative answers.

10.5 Prospects of employment over the next 3-4 months

It refers to managers' prospects of employment in the 3-4 months following the survey, as a weighted percentage balance of positive and negative answers.

11. DOMESTIC MFI CREDIT TO HOUSEHOLDS (BoG; monthly indices)

This is compiled on the basis of data delivered by all credit institutions to the Bank of Greece on a monthly basis. In the table of key short-term indicators for the real estate market, domestic MFI credit is broken down to two categories:

- Net flow of credit to households (total; index = 11.1)

⁹ Find below some questions from the construction questionnaire:

Q3. Do you consider your current overall order books to be...?

- + more than sufficient (above normal)
- = sufficient (normal for the season)
- not sufficient (below normal)

Q4. How do you expect your firm's total employment to change over the next 3 months? It will...

- + increase
- = remain unchanged
- decrease

¹⁰ According to European Commission estimates, any decline or increase in the construction confidence indicator is often largely associated with seasonal factors.

- Net flow of housing loans (index = 11.2).

These comprise loans and securitised loans and are made public on a monthly basis in Bank of Greece Press Releases. They refer to the net flow of credit through the banking system, at the end of each reference period.¹¹ For more information, see the Bank of Greece website: <http://www.bankofgreece.gr/Pages/en/Statistics/monetary/financing.aspx>

12. INTEREST RATES ON HOUSING LOANS (BoG; monthly indices)

The Bank of Greece started collecting data about interest rates on bank deposits and loans in October 2002. This data is collected from all credit institutions operating in Greece, either with a registered office in Greece or as branches of foreign credit institutions. The interest rate is calculated after allowing for any compound interest on the basis of what credit institutions pay and receive on their own account. It should also be noted that the calculation of loan rates only takes into consideration interest paid by credit institution customers for the loan, excluding other expenses. Specifically for housing loans, banks also report the total annual charges for the customer. Additionally, housing loans include repair loans and monthly rates refer to end-of-period values.

The interest rate tables are updated on the 26th working day after the end of the data reference month and are available on the Bank of Greece website: http://www.bankofgreece.gr/Pages/en/Statistics/rates_markets/deposits.aspx.

12.1 Interest rates on new housing loans

It refers to interest rates on new loans (including repair loans), together with borrower's charge, and non-interest charges (handling fees, mortgage registration, etc.) at the end of each reference period.

The index is published on the Bank of Greece website, at the following link: Statistics ==> Financial Markets and Interest Rates ==> Bank Deposit and Loan Interest Rates ==> Bank interest rates on new euro-denominated deposits and loans vis-à-vis euro area residents (Table 1 and 1a): http://www.bankofgreece.gr/Pages/en/Statistics/rates_markets/deposits.aspx

12.2 Interest rates on outstanding housing loans with an initial maturity of over 5 years

It refers to interest rates on the outstanding balance of housing loans (including repair loans), excluding borrower's charges at the end of each reference period.

The index is published on the Bank of Greece website, at the following link: Statistics ==> Financial Markets and Interest Rates ==> Bank Deposit and Loan Interest Rates ==> Bank interest rates on the outstanding amounts of euro-denominated deposits and loans vis-à-vis euro area residents (Table 2 and 2a): http://www.bankofgreece.gr/Pages/en/Statistics/rates_markets/deposits.aspx

¹¹ The Bank of Greece publishes data on bank credit on a monthly basis. As a rule, all monetary and bank statistics data is based on monthly financial statements that, pursuant to applicable Bank of Greece Governor's Acts, are submitted by monetary financial institutions (MFIs) to the Bank of Greece. The MFIs include the Bank of Greece, credit institutions operating in Greece, as well as money market funds. A list of Greek MFIs is published on the Bank of Greece website: <http://www.bankofgreece.gr/Pages/en/Statistics/monetary/catalogue.aspx>

13. FINANCIAL STRESS INDICATORS (BoG; quarterly indices)

13.1 Non-performing housing loans ratio

It is compiled by the Bank of Greece on a quarterly basis and represents the share of non-performing housing loans (to total housing loans). Primary data is collected from all commercial banks active in Greece. The data is presented in various Bank of Greece reports (Governor's Report, Monetary Policy Report and Financial Stability Report).

13.2 Housing loans to households as a percentage of GDP

This represents changes in housing loans as a percentage of GDP. It is compiled by the Bank of Greece on a quarterly basis. Housing loans include securitised loans and refer to end-of-period data. The Gross Domestic Product is published on a quarterly basis in the ELSTAT press releases with the quarterly National Accounts.