

Statistical Service of Cyprus



QUARTERLY NATIONAL ACCOUNTS

INVENTORY

Nicosia

January 2022

Contents

Chapter 1: Overview of the System	4
1.1 Organisation and institutional arrangements	4
1.2 Publication timetable, revisions policy and dissemination of QNA.....	5
1.2.1 Publication timetable and dissemination of QNA	5
1.2.2 Revision policy	6
1.3 QNA compilation approach	7
1.4 Seasonal adjustment and working day adjustment	8
1.5 Balancing, benchmarking and other reconciliation procedure	8
1.6 Volume estimates.....	8
1.7 Additional information	8
Chapter 2: Publication timetable, revisions policy & dissemination of QNA.....	10
2.1 Release policy	10
2.2 Revision policy	11
2.3 Contents published.....	12
2.4 Special transmissions.....	13
2.5 Policy of metadata	13
Chapter 3: Overall QNA compilation approach.....	14
3.1 Overall compilation approach	14
3.2 Balancing, benchmarking and other reconciliation procedures.....	15
3.3 Volume Estimates	16
3.4 Seasonal and Calendar adjustments.....	16
Chapter 4: GDP components - the production approach.....	18
4.1 Gross value added, including industry breakdowns.....	18
4.2 The treatment of FISIM.....	21
4.3 Taxes less subsidies on products	21
4.3.1 Value Added Tax.....	22
4.3.2 Custom duties & Taxes on Imports	22
Chapter 5: GDP components - the expenditure approach.....	23
5.1 Household Final Consumption Expenditure (HFCE)	23
5.2 Other Final Consumption Expenditures	25
5.3 Capital Formation (CF).....	25
5.4 Imports – Exports.....	27
Chapter 6: GDP components - the income approach	29

6.1 Compensation of Employees, including components (Wages & Salaries and Employers' Social Contributions)	29
6.2 Taxes less subsidies on production and imports	30
6.3 Gross operating surplus & mixed income.....	30
Chapter 7: Population and employment	31
7.1 Population.....	31
7.2 Employment: persons.....	31
7.3 Actual Hours worked	32
Chapter 8: Flash Estimates	33
8.1 Flash GDP estimate.....	33
8.2 Flash employment estimate	37
Chapter 9: Main Data Sources used	38
9.1 Production approach	38
9.2 Expenditure approach	38

Chapter 1: Overview of the System

1.1 Organisation and institutional arrangements

The Statistical Service of Cyprus (CYSTAT) is the competent authority responsible for the compilation and the publication of most of the official statistical data in Cyprus. The Statistical Service, until January 2000 under the name Department of Statistics and Research, was set up in 1950 as a small administrative unit while its real function started after Cyprus became independent, in 1960. CYSTAT, although functions under the Ministry of Finance, maintains its autonomy in technical matters and has exclusive responsibility for the choice of methodology, technique, definitions and procedures for the realization of the programmes of statistical activities, as well as for the publication of the statistical data produced. Since the accession of Cyprus in the European Union in May 2004, an important part of the basic activities of CYSTAT include the continuous participation to several committees, working groups and educational programs as well as the collaboration with the Statistical Offices of the European Union (EUROSTAT).

CYSTAT is organised by subject matter on the basis of 4 main Divisions and 3 supporting Sections.

The main statistical Divisions are:

- National Accounts and Government Finance Statistics
- Business Statistics, Energy, Environment, Agriculture, Science & Technology and Foreign Trade Statistics, International Cooperation and Programming
- Methodology, Statistical Dissemination, Prices, Labour Market and Information Society
- Demographic, Social and Tourism Statistics

The supporting sections pertain to the following:

- Data Processing and Technical Support
- Registry
- Accounts

CYSTAT currently employs 97 permanent staff. Additionally, 56 persons are employed on a full-time basis on an indefinite contract, along with around 75 persons on a part-time basis, who are engaged in the various censuses and sample surveys, primarily at the data collection phase.

National Accounts and Government Finance Statistics Division consists of 4 units of 16 persons of permanent staff in total. These 4 units are:

- Annual National Accounts (ANA)
- Quarterly National Accounts (QNA)
- Government Finance Statistics (GFS) & Institutional Sectors (IS)
- Supply-Use and Input-Output Tables (SUIOT)

1.2 Publication timetable, revisions policy and dissemination of QNA

1.2.1 Publication timetable and dissemination of QNA

CYSTAT rendered its website as the main source of statistical information, without this entailing the suppression of other printed means of dissemination as publications, bulletins and statements via the press.

CYSTAT publishes on its website two types of release calendar: The annual release calendar which contains the dates of the Press Release and announcements of CYSTAT, which are preliminary scheduled to be released during the current year and the weekly release calendar, which contains the dates scheduled to be released in the following week.

The various statistical areas are categorised in five Statistical Themes as follows:

- Population and Social Conditions
- Economy
- Business Sector
- Science and Technology
- Energy, Environment

QNA are disseminated at the same time for all, national and external users, on its website (<https://www.cystat.gov.cy/>) under the Statistical Theme “Economy”.

CYSTAT set up its first effort in compiling QNA at the beginning of 2001 since Cyprus was obliged, among EU Member States, to produce QNA on a regular basis. Special acknowledgements are expressed to the Italian experts, Giovanni Savio, Marco Marini and Claudia Cicconi, for their valuable assistance for setting up the QNA Production System (QNAPS) in Cyprus as well as for their relevant written reports and views expressed.

Moreover, financial support was provided by the European Commission, which is here gratefully acknowledged (Grant Agreement, contract number 41100.2005.006-2006.546).

The first transmission to Eurostat took place at the beginning of 2002. Initially, only the GDP growth was transmitted to Eurostat, but since then, an effort has been made to achieve a full set of data transmission. Currently, the questionnaires tables T0101, T0102 and T0103 are regularly transmitted at t+2 months, in raw, working day and working day/seasonally adjusted form at current, chain-linked and previous year prices.

In addition, a flash estimate of GDP is calculated at t+45 days and transmitted to Eurostat since 2007. Concerning the length of the series, QNA data is available from the 1st quarter of 1995.

As already mentioned, the QNA are disseminated at the same time for all, national and external users. Consequently, the directive concerning the publication timetable of CYSTAT is driven by the coordinated release dates of QNA of Eurostat. As a result, for the time being, CYSTAT disseminates its QNA at t+45 days and at t+2 months.

1.2.2 Revision policy

The revision routine policy of QNA is closely related to that of ANA. A full set of annual data is available from 1995 onwards, while the last two years refer to preliminary estimates, till the results of the annual surveys are incorporated in NA estimates. As soon as the revised ANA are available, the econometric relationships are re-estimated, the Chow-Lin quarterly disaggregation procedure is running with the new estimated coefficients and thus, the quarters may be revised. In addition, occasional revisions of ANA and subsequently of QNA may be carried out irregularly according to particular needs.

Generally, it has been noticed that causes of routine revisions in QNA essentially include:

- i. Revisions due to changes in ANA
- ii. Revisions due to seasonal adjustment
- iii. Revisions due to the changes of the econometric relationships
- iv. Revisions due to changes/revisions of the short-term indicators used
- v. Revisions due to the availability of indicators and the replacement of forecasts, with actual data
- vi. Seasonally adjusted time series may be revised with every release irrespective of whether the original time series has been revised or not.

1.3 QNA compilation approach

QNA are an important part of National Accounts system, since they are the main source of information produced shortly (t+45 days & t+2 months) after the reference period (quarter) in order to analyse and evaluate the growth of Cyprus economy. Cyprus QNAPS accommodates a number of indicators, such as short-term economic indicators by activity, administrative data, quarterly employment data and price indices, in order to produce quarterly estimates of the value added by activity sector (production approach) and by type of expenditure (expenditure approach). Production and Expenditure approaches are the main procedures used to estimate GDP, with production approach to be the dominant one. Income approach is a residual item procedure due to the limited information available.

Cyprus set up its efforts in calculating and transmitting QNA data in 2001. Nowadays, data at current prices, Chain-Linked and previous-year-prices are regularly produced, published and transmitted to Eurostat at t+2 months, in unadjusted, calendar adjusted and working day/seasonally adjusted form. In addition, a flash estimate of GDP in volume is calculated at t+45 days, published and transmitted to Eurostat. The flash estimate is obtained by running the same estimation procedure as the one applied for the t+2 months calculation however, with less input information available.

QNA are compiled in accordance with the European System of Accounts -ESA 2010 as defined in Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013.

The lack of the same sources used at annual level does not allow to employ the same methodology at quarterly level. For this reason and on the basis of the guidelines of Eurostat, CYSTAT adopted an indirect approach in estimating QNA, instead of relying on direct estimates based on quarterly ad-hoc surveys. The annual data is temporally disaggregated by means of related indicators observed at quarterly frequency. The Chow-Lin's approach (1971) is used to this purpose, a well-known temporal disaggregation technique. The Chow-Lin's quarterly disaggregation procedure is applied to the annual data of the past years in order to obtain the estimates of the four quarters of the current year, using extrapolations considering the short-term paths of the pertinent related time series.

The quality of the relation between annual data and indicators is analyzed. Ad-hoc deterministic effects are introduced in some cases in order to improve the diagnostics of the regressions and thus their ability to extract the short-term information provided by the indicators.

1.4 Seasonal adjustment and working day adjustment

The model-based approach is used to seasonally adjust the time series. The process of seasonal adjustment is carried out on related indicators through the TRAMO-SEATS model based method. The preferred indicators are seasonally adjusted (SA) and then, the SA indicators are used to obtain seasonal adjusted versions of the NA aggregates.

The calendar adjustment is generally applied for three effects, associated to the calendar structure; working days, Easter and leap year. In the case of Cyprus only the two of them are taken into consideration, the working day and the leap year. The Easter effect is not applicable as for the Orthodox countries, Easter is either in April or May which then means that Easter is always during the 2nd quarter of the year. Thus, at quarterly level, Easter has no impact on working day adjustment.

1.5 Balancing, benchmarking and other reconciliation procedure

The coherency of the QNA to the ANA is guaranteed by the temporal disaggregation, while the QNA are benchmarked to the annual data produced by the end of September and their revisions.

Annual accounts are revised when the Supply and Use tables (SUT) are finalised, that is, approximately two years after the end of the statistical reference year.

The level of GDP is defined from the computations on the production approach, where Changes in Inventories and Gross Operating Surplus/Mixed Income are computed as residual items for the expenditure and income approach respectively.

1.6 Volume estimates

Annual and Quarterly National Accounts are estimated at current prices, previous year prices and chain-linked volumes. The purpose of the valuation in volume terms is to assess the dynamics of economic development irrespective of price fluctuations. Currently, the year 2010 is used as the reference year for the chain-linked volumes.

1.7 Additional information

Cyprus started compiling QNA at the beginning of 2001. At that time, only the GDP growth rate was published and transmitted to Eurostat.

From the 1st quarter of 2003 onwards, data on Production and Expenditure was compiled and transmitted, while a full set of analytical data has been available to users since the 3rd quarter of 2005. The data consists of the analysis of production, expenditure and income approach, in raw, working day and working day/seasonally adjusted form.

By the first transmission of data in 2006, CYSTAT transmitted a full dataset at approximately t+60 days. As most of the indicators were available at t+90 days, the new data resulted in significant revisions for consecutive quarters due to the forecasting of missing key-indicators in respect to the t+60 days transmission. Those revisions appeared to be more remarkable when QNA results were examined in more detail and specifically by economic activity.

CYSTAT started, in 2007, to produce and publish flash estimates at t+45 days. As a result of this, the publication policy changed in order to avoid having extensive revisions, that could create confusion to the users of statistical information. A derogation concerning QNA transmission program was granted to Cyprus and other countries; a full dataset would regularly be produced, submitted to Eurostat and published on the website at t+70 days in raw, working day and working day/seasonally adjusted form, which was in accordance with Eurostat regulation at that time.

The revisions' level was also reduced when the National Accounts Division took initiatives and arranged meetings with the data providers so that to examine ways of having the indicators available earlier than t+60 days. The result of these meetings was to achieve the timely provision of most of the indicators that are used as input sources to QNAPS. Furthermore, the reduction of the timeliness of the STS transmission program contributed significantly to the above achievement.

Since February 2021, Cyprus transmission program is in line with the transmission program of Eurostat of (t+2 months), since the derogation timeliness for QNA ended in 2020.

Chapter 2: Publication timetable, revisions policy & dissemination of QNA

2.1 Release policy

QNA and ANA estimations are closely related and take advantages from each other. The estimation of 4th quarter for the year T-1 is carried out each February. Consequently, the first annual estimate for year T-1 is compiled based on the 4 quarterly estimates of the year. This estimation is kept unchanged up to September, when the ANA proceed with a revised estimate for the year T-2 due to the information obtained from the annual economic surveys. Moreover, the ANA proceed to a limited extent revision of the year T-1, due to revised data sources (indicators) used for the compilation of QNA. In August, according to the transmission program, QNA are obliged to compile an estimation for the 2nd quarter of the current year (T). However, in September, an updated estimation is carried out by QNA, in order to incorporate the annual revised data.

There is a close relationship between annual and quarterly releases, as follows:

1. A first preliminary estimate of annual data for year “T” is released at the end of June (T-6 months). This preliminary release contains no breakdown and gives only some overview of the economic development in Cyprus.
2. A second annual estimate for the year is compiled in February (T+2 months) and it is based on the 4 quarterly estimates of the year as a result of the QNA data. The analysis of year “T” is extended and the maximum level of detail is given.
3. A third annual estimate is released at the end of September (T+9 months) and contains revised data for the years T-2 and T-1 and a limited revision of the year “T”.

According to this procedure, QNA estimates of the current year (T) are compiled without a priori knowledge of the ANA.

A simulation process is also run, in order to compare the results obtained from QNA production process with and without the constraint of ANA estimates. To finalize the estimates for the year, the results coming out from the simulation process and any additional information available for the relevant activities are taken into account.

QNA are concurrently disseminated for both national and external users. In that way the directive concerning the publication timetable of CYSTAT is driven by the coordinated release dates of QNA of Eurostat. CYSTAT disseminates QNA at t+45 days and at t+2 months. These dates are communicated to CYSTAT’s website users through the Annual Release Calendar.

2.2 Revision policy

There are two important types of revisions, which represent the core of National Accounts compilation, namely (i) routine revisions and (ii) major revisions.

(i) Routine revisions

Routine revisions include all changes for a particular period that are in principle based on any changes that might occur in the data sources, or the adoption of the last available data. Their purpose is to achieve full comparability in volume and price changes with the previous year and for all data of a certain time period. The necessity for these revisions is arising as new data is made available between data transmissions.

In the case of QNA, the revision policy varies by quarter. In general, routine revisions for the quarterly data are due to (a) Revisions due to changes in the annual accounts; (b) Revisions due to changes/revisions in the short-term indicators used; (c) Revisions due to the replacement of forecasts with indicators that become available.

The availability of data dictates also the revision of the ANA results. The first annual estimates for the last completed year are compiled in February of the following year and are considered provisional. These estimates are based on the quarterly indicators, as well as administrative sources. The final estimates are published in September, 21 months after the end of reference year, when the annual economic surveys, which are the main source, become available (18 months after the end of the reference year).

(ii) Major Revisions

Major, or benchmark revisions, which are made every five years in September, include any revisions made to the NA data, mainly due to methodological changes, or significant changes in data sources. In particular, these revisions include:

Integration of new methodologies or introduction of new classifications (i.e. ESA 2010, transition to NACE Rev.2) and treatment of action points, as well as specific and transversal reservations according to Eurostat guidelines.

The QNA proceed to a re-estimation in order to be in line with the ANA estimates.

2.3 Contents published

As already mentioned, CYSTAT disseminates the QNA at t+45 days and at t+2 months.

At t+45 days a flash estimate is compiled and the GDP growth in volume terms, is transmitted to Eurostat, in working day and working day/seasonally adjusted form. Eurostat publishes the growth rate compared to the previous quarter and compared to the same quarter of the previous year for all member states and computes the quarterly growth rates at EU level.

The GDP level is provided for both raw and working day/seasonally adjusted data on CYSTAT's website (<https://www.cystat.gov.cy/>). As far as it concerns national users, the analysis in raw data still seems to be more important and more comprehensible and thus, CYSTAT publishes on its website the growth rate of GDP in raw data compared to the same quarter of the previous year and in seasonally adjusted form compared to the same quarter of the previous year and also to the previous quarter.

At t+2 months CYSTAT produces a full set of quarterly accounts which is submitted to Eurostat and also published on its website.

Questionnaire tables:

- 'T101VNN', 'T101VWN', 'T101VYN', 'T101LNN', 'T101LWN', 'T101LYN', 'T101YNN', 'T101YWN', 'T101YYN'
- 'T102VNN', 'T102VYN', 'T102LNN', 'T102LYN', 'T102YNN', 'T102YYN'
- 'T103VNN', 'T103VYN'

The first four characters denote the reference table, while the last three indicate the concept of the data (VNN: current prices, raw; VWN: current prices, working day adjusted; VYN: current prices, working/seasonally adjusted; LNN: volume, raw; LWN: volume, working day adjusted; LYN: volume, working/seasonally adjusted; YNN: previous year prices, raw; YWN: previous year prices, working day adjusted; YYN: previous year prices, working/seasonally adjusted).

The growth rate of GDP in raw data compared to the same quarter of the previous year and the growth rate of seasonally adjusted data compared to the same quarter of the previous year and to the previous quarter are also presented on CYSTAT's website. A brief description regarding the developments of the main economic indicators during the current quarter is also provided.

2.4 Special transmissions

The data is only transmitted to Eurostat and published on the website of CYSTAT.

2.5 Policy of metadata

Metadata information for National Accounts is available on the website of CYSTAT. A short summary with the developments of the main indicators is accompanied the publication of tables T0101 & T0102. Finally, a description of the aggregates estimated both on a quarterly and on an annual basis is presented on CYSTAT's website.

Chapter 3: Overall QNA compilation approach

3.1 Overall compilation approach

CYSTAT applies the indirect approach in estimating QNA, instead of relying on direct estimates based on quarterly ad hoc surveys. According to this method, QNA are generally constructed on the basis of short-term indicators using a temporal disaggregation technique (Chow-Lin's approach - 1971). Each account series is linked to one or more related quarterly series, available at the time of compilation of the account series themselves. Apart from the estimation of single series, statistical methods are also used in order to achieve the accounting relationships. It is noted that the quality of the final results in the estimation of QNA depends on a number of factors, the most important one being - for countries adopting an indirect approach - the quality of the indicators used. The ability of short-term indicators to give reliable and timely information on the evolution of the phenomena under study is an essential feature to be addressed at the very preliminary stage, in order to get reliable estimates.

The GDP level in Cyprus is determined from the production and expenditure approaches. Production approach is considered to be the dominant one, while the income approach is considered a residual item.

Based on the production approach, the table below shows the classification of Gross Value Added (GVA) by economic activity (NACE Rev. 2), with the relative weights and with respect of the GDP from 2010 to 2020. On average, the services sector accounts for about 74.2% of GDP for the period 2010-2020, while industry and agriculture contribute around 11.6% and 2.1 % to GDP respectively. Taxes less subsidies account for about 12.1% of the GDP.

Table 3.1: Percentage Distribution of Gross Value Added at current prices by Economic Activity

NACE Rev. 2	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Primary (A & B)	2,3%	2,3%	2,1%	2,1%	2,0%	2,0%	2,3%	1,9%	1,8%	1,8%	2,0%
Secondary (C to F)	14,2%	12,6%	11,7%	10,7%	9,9%	10,1%	10,8%	11,2%	11,9%	12,6%	12,4%
Tertiary (G to T)	71,6%	73,9%	74,9%	76,1%	75,8%	75,5%	74,5%	74,1%	73,3%	72,8%	74,1%
Taxes less Subsidies	11,9%	11,2%	11,3%	11,1%	12,4%	12,5%	12,5%	12,8%	13,0%	12,8%	11,5%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

NACE Rev. 2	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
A	2,1%	2,2%	2,0%	2,0%	1,9%	1,9%	2,2%	1,8%	1,7%	1,7%	1,9%
B	0,2%	0,2%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%
C	5,1%	4,6%	4,2%	3,9%	4,1%	4,3%	4,6%	4,8%	5,3%	5,4%	5,4%
D	1,3%	1,2%	1,5%	1,7%	1,3%	1,5%	1,5%	1,0%	0,9%	1,0%	0,8%
E	0,6%	0,6%	0,7%	0,8%	0,8%	0,7%	0,7%	0,7%	0,7%	0,6%	0,6%
F	7,3%	6,2%	5,3%	4,3%	3,7%	3,5%	4,0%	4,6%	5,0%	5,6%	5,5%
G	10,0%	9,6%	9,5%	8,9%	9,2%	9,1%	9,3%	9,8%	9,8%	9,6%	9,8%
H	6,6%	7,1%	6,4%	6,8%	6,7%	6,9%	6,4%	6,2%	6,5%	6,5%	6,2%
I	4,6%	5,1%	5,4%	5,5%	5,8%	5,7%	6,2%	6,1%	6,1%	6,0%	3,8%
J	3,2%	3,2%	3,2%	3,8%	4,2%	4,2%	5,1%	5,5%	5,6%	5,8%	6,3%
K	7,8%	8,5%	9,4%	10,6%	10,8%	11,2%	9,9%	9,1%	7,4%	6,8%	7,2%
L	8,3%	8,8%	9,3%	9,2%	8,4%	8,3%	8,3%	8,3%	8,8%	8,8%	9,8%
M	6,6%	6,8%	6,6%	6,6%	7,0%	7,2%	7,3%	7,4%	7,3%	7,3%	7,7%
N	1,4%	1,4%	1,3%	1,4%	1,5%	1,5%	1,5%	1,6%	2,0%	1,9%	1,9%
O	9,6%	10,1%	10,4%	10,0%	8,9%	8,4%	7,8%	7,7%	7,4%	7,4%	8,2%
P	5,8%	5,4%	5,4%	5,8%	5,8%	5,6%	5,4%	5,3%	5,4%	5,4%	5,9%
Q	3,4%	3,4%	3,5%	3,7%	3,7%	3,5%	3,5%	3,4%	3,5%	3,5%	3,8%
R	1,5%	1,7%	1,8%	1,5%	1,5%	1,5%	1,4%	1,4%	1,4%	1,5%	1,4%
S	1,7%	1,5%	1,5%	1,4%	1,4%	1,5%	1,4%	1,4%	1,4%	1,4%	1,4%
T	1,1%	1,2%	1,1%	1,0%	1,0%	0,9%	0,9%	0,8%	0,8%	0,8%	0,9%

3.2 Balancing, benchmarking and other reconciliation procedures

During a calendar year, nine processes are performed for the production of QNA; four estimation processes concerning the so called “Flash Estimate” and five estimation processes concerning the “Regular Estimation”. The fifth regular estimation is resulting from the need to incorporate in QNA the revised ANA which are available at the end of September each year. The revised QNA are then recalculated, published and re-transmitted to Eurostat in order to achieve coherency between the annual and quarterly data. Also, in February, the first provisional estimation of the value added of the previous year (T-1) is computed within the QNA framework as the sum of the 4 quarters. Normally, this 1st estimation is not changed until September, when a revision of ANA and QNA is performed.

The GDP estimate is computed from the production approach, for which the quality of short-term indicators available is higher than those of the expenditure approach. In addition to temporal disaggregation techniques, statistical methods are also applied in order to achieve the accounting

relationships defining QNAs. As no quarterly indicator is available for changes in inventories and gross operating surplus/mixed income, these are computed as residual items. Changes in Inventories is the residual item between the GDP obtained from the production approach and the expenditure approach. On the other hand, operating surplus/mixed income is the residual item between the GDP obtained from the production account and the “Compensation of Employees” plus the “Taxes on Production & Imports less Subsidies” from the income approach.

3.3 Volume Estimates

QNA are produced at current prices, previous year prices and chain-linked volumes for all the components of both the production and expenditure approaches. Currently, the year 2010 is used as the reference period for the chain-linked volumes. The above is applied for raw, seasonal adjusted and working day adjusted data.

3.4 Seasonal and Calendar adjustments

Calendar and seasonal adjustments are performed using the TRAMO-SEATS programs. However, they are not performed on quarterly aggregates but on the indicators level. Calendar and seasonally adjusted indicators are then used in temporal disaggregation to produce the adjusted quarterly estimates coherent with the annual data.

Calendar adjustment is only performed on monthly indicators. The only calendar effects that are removed, if significant, are the working days and leap year.

The regressors for removing working days are constructed taking into account the national calendar of Cyprus and are normalized so as to eliminate the seasonal component associated to the calendar, removing long run period-specific averages. A preliminary analysis is performed using JDemetra+ to test the significance of the effects and the selected calendar adjustments are then implemented in the estimation procedure where, TRAMO-SEATS is let free to automatically identify the appropriate ARIMA model and the outliers at each estimation round. Finally, calendar adjusted monthly indicators are aggregated at quarterly frequency before being seasonally adjusted.

For seasonal adjustment, a preliminary analysis is performed with JDemetra+ as to exclude non-seasonal series and to identify eventual problematic series for which the automatic model selection is not satisfactory. In addition, special attention is devoted to the most important series. For the problematic series, a suitable model specification is selected and imposed in the estimation procedure, while TRAMO-SEATS automatically identifies the outliers and estimates the parameters at each estimation round. For all the other series, a concurrent strategy is adopted by letting TRAMO-

SEATS free to identify automatically model & outliers and estimate the parameter at each estimation round.

Several tools were developed for monitoring the quality of seasonal adjustment, like the output files produced by TRAMO-SEATS (i.e summary information that presents the main statistics that assess the quality of the outcomes). In addition, the estimation system allows the user to create and save tables that can be used in order to assess the quality of seasonal adjustment.

Chapter 4: GDP components - the production approach

The production approach of GDP consists of the estimation of Gross Value Added (GVA) at basic prices by industry and taxes less subsidies on products. GDP at market prices is obtained by adding to the value added at basic prices the net taxes on products.

4.1 Gross value added, including industry breakdowns

For the compilation of GVA, the aim is to use volume indices and proceed to the compilation of the current prices at a second stage. All quarterly indicators, which are used in the production approach, comprised of volume indicators with the exception for activities K65 & K66.

The following table presents the indicator used by economic activity (NACE Rev. 2) and the respective deflators which are mainly based on Production Price Index, Consumer Price Index (CPI) and Harmonised Index of Consumer Prices (HICP).

Table 4.1: Short-term indicators used for the quarterly disaggregation of annual accounts

Economic Activity (NACE Rev. 2)	Related indicators	Deflators
A – Agriculture, forestry and fishing	Volume index based on total hours worked	CPI for Local Agriculture Commodities
B – Mining and quarrying	Production volume index of Mining and Quarrying	Composite price index: Price index of mineral aggregates (sand, gravel and road aggregates)
C – Manufacturing	Production volume index of Manufacturing	Production Price Index of Manufacturing
D – Electricity, gas, steam and air conditioning supply	Production of Electricity in 000's kwh	Consumption of Electricity in euro per kwh (€ / Kwh)
E – Water supply; sewerage, waste management and remediation activities	Production volume index of Water supply, sewerage, waste management and remediation activities	HICP on Water Supply and miscellaneous related to dwelling
F – Construction	Composite index • Production Volume Index in Construction • Building permits in volume with 9 months time lag	Hourly labour cost index in Construction

Economic Activity (NACE Rev. 2)	Related indicators	Deflators
G – Wholesale and retail trade; repair of motor vehicles and motorcycles	Composite weighted index • Retail sales volume index • Turnover value index of sales of vehicles • Turnover value index of wholesales	Composite weighted price index • CPI of petroleum products • Implicit deflator of retail sales excl. petroleum products • CPI of Imported goods (wholesales)
H – Transportation and storage	Composite weighted index • Turnover value index for Land transport • Turnover value index for Water transport • Turnover value index for Air transport • Turnover value index for Warehousing and Supporting activities • Turnover value index for Postal	Composite weighted price index • HICP on land transport • CPI on cruises (water transport) • HICP on air transport • HICP on Transport Services • HICP for postal services
I – Accommodation and food service activities	Composite index • Tourists Arrivals (for Accommodation Services) • Turnover Restaurant Index	CPI for Restaurants
J – Information and communication	Turnover index for Information & Communication	CPI for Telecommunication and Total CPI
K64 – Financial Service Activities, except Insurance & pension funding	Central Bank's Index for FISIM & non-FISIM	Relevant COICOP indicator
K65 – Insurance, reinsurance & pension funding, except compulsory social security	Premiums for Insurances minus Claims	Relevant COICOP indicator
K66 – Activities auxiliary to financial services and insurance activities	Foreign Investment Companies	Relevant COICOP indicator
L– Real Estate Activities	New additions of Dwellings	HICP on Actual Rentals for housing

Economic Activity (NACE Rev. 2)	Related indicators	Deflators
M – Professional, Scientific and Technical Activities	Hours Worked	CPI
N – Administrative and Support Service Activities	Hours Worked	CPI
O – Public Administration And Defence; Compulsory Social Security	Persons	Composite index: • Wages • Wages cut off
P – Education	Hours Worked	CPI for Education
Q – Human Health and Social Work Activities	Hours Worked	CPI for Health
R – Arts, entertainment and recreation	Hours Worked	CPI for Arts, entertainment and recreation
S – Other service activities	Hours Worked	CPI for Other service activities
T – Activities of households as employers	Hours Worked	Annual implicit deflator for Activities of households as employers

In order to estimate GVA at current prices, the annual deflators for each branch of economic activity are disaggregated to the quarters using the monthly-quarterly deflators, as shown in the above table. This approach follows in a similar way the corresponding practices which are followed in the compilation of ANA.

The estimation procedure of the production approach covers the following steps, as described below:

- i. after the volume/value indicators and price indices are loaded to QNA Production System (QNAPS), any missing observations are forecasted and the calendar adjustment on indicators is performed. For section C and G both working days and leap year effects are removed, while for section B, D, E and I only the working days effect are removed. Any monthly calendar adjusted indicators are aggregated to quarterly frequency and thus, a complete set of quarterly calendar adjusted indicators is generated. Afterwards, seasonal adjustment of the indicators and prices is performed followed by the temporal disaggregation of chain-linked annual data for which volume indicators are available. This is done, using unadjusted, calendar adjusted and seasonally adjusted indicators.
- ii. temporal disaggregation of annual implicit deflators of industries A to T (NACE Rev. 2)

- iii. temporal disaggregation of annual data at current prices of industries for which value indicators are available (activities K65 and K66, taxes on products and subsidies on products)
- iv. computation of quarterly estimates at current prices for those industries which the volume indicators are available, by multiplying the chain-linked quarterly estimates with the quarterly deflators and benchmark them to the corresponding annual total
- v. completion of the estimation by computing the quarterly estimates of chain-linked value added for activities K65 and K66 and dividing the quarterly estimates at current prices by the quarterly chain-linked deflators and benchmark them to the corresponding annual data.

4.2 The treatment of FISIM

Another important issue in quarterly Accounts is the calculation of FISIM. Two approaches could be followed in QNA system based on an indirect approach:

1. Disaggregation of the annual series including FISIM with the usual indicators.
2. Consider the amount of FISIM separated from the rest of each series and estimate this part as an independent item.

The second approach is considered the most appropriate when information on quarterly FISIM is available and sufficiently reliable. Unfortunately, this is not the case of Cyprus. The information used to calculate and distribute FISIM to different economic agents at annual level is not available on a quarterly basis. Given the lack of quarterly sources, the first approach is considered as the most feasible solution for the time being. The direct estimation of FISIM remains nevertheless an important issue of QNA, and it is going to be considered as a priority in the future activities of CYSTAT.

Therefore, the adoption of the first approach enables the production of QNA with FISIM allocated and all QNA data is now consistent with the corresponding annual data in this respect.

4.3 Taxes less subsidies on products

The indicators that are used for taxes and subsidies on products, they are themselves estimates at current prices, provided by GFS.

Table 4.3: Short-term indicators used for Taxes & Subsidies

Economic Activity (NACE Rev. 2)	Related indicators	Deflators
Taxes	Taxes on Products (D21)	GVA Implicit Deflator
Subsidies	Subsidies on Products (D31)	GVA Implicit Deflator

Due to the lack of quarterly information on the price component of taxes and subsidies on products, these two accounting items are not estimated in volume terms at quarterly frequency. Net taxes of products in volume are estimated by assuming that the price component of net taxes has no effect on the dynamics of GDP in volume. This is achieved by imposing that the year-to-year growth rate of chain-linked GDP equals the year-to-year growth rate of chain-linked GVA at basic prices. On an annual basis, GDP growth rate in volume equals to the corresponding growth rate of GVA.

Quarterly estimates at previous-year-prices are computed implicitly by combining the estimates at current prices and those at chain-linked volumes.

4.3.1 Value Added Tax

The Value Added Tax (VAT) is collected by the Tax Department. Data is provided on a monthly basis at 15 to 20 days after the end of the reference month.

4.3.2 Custom duties & Taxes on Imports

Custom Duties is defined as the amount paid on goods of a particular type when they enter the economic territory.

Taxes on Imports are defined as taxes on goods/services that become payable at the moment they cross the national or customs frontiers of the economic territory or when these services are delivered by non-resident producers to resident institutional units.

Data, for the above variables, is collected from an administrative source (Financial Information Management Account System - FIMAS) on a monthly basis at 15 to 20 days after the end of the reference month.

Chapter 5: GDP components - the expenditure approach

The expenditure approach consists of the Household Final Consumption Expenditure (HFCE), Non-Profit Institution Serving Households Final Consumption (NPISH FC), General Government Final Consumption (GGFC), Gross Fixed Capital Formation (GFCF), Changes in Inventories and Imports/Exports. The expenditure side is balanced with the production approach by using changes in inventories as a residual item.

5.1 Household Final Consumption Expenditure (HFCE)

The quarterly estimates are obtained at the two digits level of the Classification of individual Consumption by Purpose (COICOP). The available quarterly indicators are organized into two separate structures, volume and price indicators, corresponding to the COICOP functions. The annual data is used as input to the estimation procedure and has the same structure with the quarterly data and it is measured at current prices and chain-linked with reference year 2010.

The quarterly indicators are loaded in the QNA Production System (QNAPS) and any missing observations are forecasted. Afterwards, indicators and prices are seasonally adjusted followed by the temporal disaggregation of chain-linked annual HFCE, using the indicators in raw and seasonal adjustment form in order to produce the corresponding quarterly estimates.

Finally, the chain-linked deflators are temporally disaggregated, producing the corresponding quarterly estimates in unadjusted and seasonally adjusted form. Quarterly estimates of the aggregates at current prices are obtained by multiplying the chain-linked estimates with the chain-linked deflators. The result is then benchmarked to the corresponding annual aggregate at current prices. Quarterly estimates at previous-year-prices are obtained implicitly by combining the estimates at current prices and chain-linked.

The quarterly indicators refer to volume indices of the various COICOP categories at two-digit level and in many cases, they combine corresponding indicators of employment and turnover volume. The price indicators refer mainly to CPI at two-digit COICOP level.

Table 5.1: Short-term indicators & deflators used for HFCE estimates

Product Classification (COICOP)	Related indicators	Deflators
CP010	Volume index of retail sales of the corresponding product category	CPI of the corresponding product
CP020	Volume index of retail sales of the corresponding product category	CPI of the corresponding product

Product Classification (COICOP)	Related indicators	Deflators
CP030	Volume index of retail sales of the corresponding product category	CPI of the corresponding product
CP040	Volume of Electricity supply	CPI of the corresponding product
CP050	Volume index of retail sales of the corresponding product category	CPI of the corresponding product
CP060	Volume Composite index: • Employment on Health • Turnover Volume index of retail sales on pharmacies	CPI of the corresponding product
CP070	Volume Composite index: • Cypriots travelling abroad • Turnover of wholesale, retail sale and maintenance of vehicles deflated by a composite weighted index of CPI for vehicles & total CPI • Turnover of Automotive fuel in specialized stores deflated by the price index of petroleum products	CPI of the corresponding product
CP080	Composite volume index • Turnover of telecommunications deflated by the price index for telecommunication • Turnover of postal services deflated by the total price index	CPI of the corresponding product
CP090	Employment: • R: Arts, entertainment • S: Other service activities	CPI of the corresponding product
CP100	Employment of Education	CPI of the corresponding product
CP110	Composite volume index: • Tourists Arrivals (for Hotels) • Turnover Restaurant Index (deflated with CPI for Restaurants)	Price index on Hotel & Restaurants
CP120	Employment: • R: Arts, entertainment • S: Other service activities	CPI of the corresponding product

5.2 Other Final Consumption Expenditures

The category of Other Final Consumption Expenditures consists of:

- i. Final residents' consumption expenditures abroad
- ii. Final non-residents' consumption expenditures in Cyprus
- iii. Final consumption expenditures of Non-profit organization serving households
- iv. Final individual consumption expenditures of General government
- v. Final collective consumption expenditures of General government

The indicators that are used for the production of QNA for the above mentioned categories are the deflated travel index with the price index of imported/exported travel services, employment indices, Government Consumption aggregates at current prices and Consumer Price Index (CPI). Annual data is available at current prices and chain-linked volumes.

For the compilation of the above items, the relevant indicators are loaded into the QNAPS, any missing observations are forecasted, seasonal adjustment is performed and finally, unadjusted and seasonally adjusted indicators are saved. The latter are then used in temporal disaggregation of chain-linked consumption of residents abroad, chain-linked consumption of non-residents in Cyprus and chain-linked consumption of NPISH. The quarterly disaggregation of chain-linked implicit-deflators is also performed.

The quarterly estimates for the consumption of residents abroad, non-residents in Cyprus, and NPISH at current prices are obtained by multiplying chain-linked estimates with the deflators and benchmarking the results to the corresponding annual data. Estimates of individual and collective consumption of the General government are in current prices. The corresponding quarterly chain-linked (volume) estimates are obtained by dividing the estimates at current prices by the quarterly estimates of the deflators and benchmarking the results to the corresponding annual data.

5.3 Capital Formation (CF)

Capital Formation consists of Gross Fixed Capital Formation (GFCF), Changes in Inventories and Net Acquisition of Valuables.

The estimation of Gross Fixed Capital Formation is set up at a finer level than that required by the transmission program. Some of the aggregates are estimated directly (not through temporal disaggregation techniques).

The available indicators are organized into separate structures; indicators in volume, value and prices for the assets of Dwellings, Other buildings, Ships & Aircrafts, ICT, Machinery & Equipment, Weapons,

Tree plantation assets, Breeding live stocks, Animal slaughtered, Mineral exploration, Software, R&D, Literacy and artistic originals. Relevant indicators for valuables (acquisitions & disposals) are also used.

Table 5.3: Short-term indicators & deflators used for CF estimates

Type of Asset	Related indicators	Deflators
Dwellings	Volume Composite index: • Production index (dwellings) • Building permits	Composite index: • Labour cost index in construction • Price index of construction materials
Other Buildings	Volume Composite index: • Production index (dwellings) • Building permits	Composite index: • Labour cost index in construction • Price index of construction materials
Motor Vehicles	Registrations of motor vehicles	Harmonised price index of motor vehicles
Ships - acquisitions	Corresponding value from Trade Statistics	Producer price index by commodity for Transportation - Ships
Ships - disposals	Corresponding value from Trade Statistics	Producer price index by commodity for Transportation - Ships
Aircraft - acquisitions	Corresponding value from Trade Statistics	Producer price index by commodity for Transportation - Aircraft & Aircraft equipment
Aircraft - disposals	Corresponding value from Trade Statistics	Producer price index by commodity for Transportation - Aircraft & Aircraft equipment
ICT	Corresponding value from Trade Statistics	Harmonised price index
Machinery and equipment	Corresponding value from Trade Statistics	Price index for imported Capitalized Goods
Weapons	Corresponding value from administrative data	Corresponding price index
Tree plantation assets	Corresponding value from Agricultural statistics	Corresponding index from Agricultural statistics
Breeding live stocks	Corresponding value from Agricultural statistics	Corresponding index from Agricultural statistics
Animal slaughtered	Corresponding value from Agricultural statistics	Corresponding index from Agricultural statistics

Type of Asset	Related indicators	Deflators
Mineral exploration	Corresponding value from administrative data	Corresponding price index
Software, R&D, Literacy, artistic originals	Corresponding value from Trade Statistics	Harmonised price index
Valuables - acquisitions	Corresponding value from Trade Statistics	Gold price index
Valuables - disposals	Corresponding value from Trade Statistics	Gold price index

After the relevant indicators are loaded to QNAPS, any missing observations are forecasted, followed by the seasonal adjustment procedure. Afterwards, temporal disaggregation for those assets which a direct estimate is not possible, is performed, while the estimates of the other assets are produced directly.

Regarding GFCF, several assets may have negative or zero value at annual and/or quarterly level. In such cases the chain-linked estimates of these aggregates are derived by dividing the estimates at current prices with the quarterly deflators and then benchmarked them to annual totals.

Changes in inventories is the residual item and its estimate is the result of the balancing between the expenditure and production approach.

5.4 Imports – Exports

Imports and Exports are comprised of Goods and Services during the production of QNA estimates. The Input data variables are the indicators of imports and exports in value and price indices respectively. Special treatment is applied for estimating the deflator of imports and exports of goods.

Table 5.4: Short-term indicators & deflators used for Imports-Exports

Category	Related indicators	Deflators
Exports of goods	Value of Exports of goods	Composite index: • Price index on Ships • Price index on Airplane • Price index on exports of goods
Exports of services	Value of Exports of services	Price index on exports of services

Category	Related indicators	Deflators
Imports of goods	Value of Imports of goods	Composite index: • Price index on Ships • Price index on Airplane • Price index on imports of goods
Imports of services	Value of Imports of services	Price index on imports of services

For the compilation of QNA estimates imports and exports, the relevant indicators are loaded into the QNAPS, any missing observations are forecasted, followed by seasonal adjustment of the indicators. Afterwards, temporal disaggregation of annual aggregates at current prices and of annual deflators is performed. Quarterly estimates of chain-linked aggregates are obtained by dividing estimates at current prices with the corresponding deflators and benchmarking the results to chain-linked annual data. Quarterly estimates at previous-year-prices are obtained implicitly, combining the estimates at current prices and the chain-linked volumes.

Chapter 6: GDP components - the income approach

Income approach for estimating GDP consists of the Compensation of employees (CE), Gross operating surplus/Mixed income (GOS), Taxes on production and imports (T) and Subsidies on production and imports (S). The formula for calculating GDP is the following:

$$\begin{aligned} \text{GDP} = & + \text{Compensation of employees (CE)} \\ & + \text{Gross operating surplus/Mixed income (GOS)} \\ & + \text{Taxes on production and imports (T)} \\ & - \text{Subsidies on production and imports (S)} \end{aligned}$$

As already mentioned, production approach is considered to be the dominant one for estimating the level of GDP. Therefore, the estimates of production approach are used as benchmarks for the income approach.

Given the above, it was decided to estimate independently the Compensation of employees, the Taxes and Subsidies on production and imports and derive the Gross operating surplus/Mixed income as a residual item in the income approach.

For the compilation of QNA for the income approach, temporal disaggregation of annual data with quarterly indicators is applied to the components of income aggregates. The procedure assures the coherency of annual and quarterly series and it is based on an indirect estimation of the aggregates, such as for the components of production and expenditure approach, since the data sources, on which the annual estimations are based, are not available on quarterly frequency.

The income approach corresponds to table T0103 of ESA 2010 transmission programme. The variable Compensation of employees is estimated at A10 level and it is comprised of Wages & Salaries and Employers' Social Contributions. Taxes on production and imports and Subsidies on production and imports are estimated at the total economy level. Gross operating surplus/mixed income is calculated as a residual item based on the balancing with the GDP in production approach. It is noted that the data of the above variables is produced at current prices only.

6.1 Compensation of Employees, including components (Wages & Salaries and Employers' Social Contributions)

Compensation of employees is defined as the total remuneration, payable by an employer to an employee in return for the work done by the latter during the accounting period. It is composed by:

- Wages and salaries
- Employer's social contributions

Wages & salaries include basic wages and salaries payable at regular intervals, paid for overtime work, weekends, official holidays, etc. They include also the amount for any social contributions, income taxes, etc. which are paid by the employee.

The social contributions paid by employers are recorded under the Compensation of employees since they represent the future entitlements of employees to social benefits.

The indicators that are used for the compilation of QNA estimates of income approach are the following:

- i. Average Earnings Index in Agriculture
- ii. Labor Cost Index
- iii. Wages and Salaries Index
- iv. Hours worked by economic activity

As soon as the above indicators are loaded into QNA Production System (QNAPS), any missing observations are forecasted, followed by the seasonal adjustment of the indicators for the per capita Compensation of employees and per capita Wages and Salaries. Afterwards, temporal disaggregation is applied on annual data of Compensation of employees and Wages and Salaries. The estimates on Compensation of employees' per-hour and wages per-hour are then multiplied by the quarterly estimates of hours worked, in order to get the total Compensation of employees and Wages & Salaries.

Finally, the estimates are benchmarked to the corresponding annual series. Final results are saved in unadjusted and seasonally adjusted form. Social contributions are estimated as a residual item by subtracting Wages and Salaries from Compensation of employees.

6.2 Taxes less subsidies on production and imports

Taxes less subsidies on production and imports are obtained directly from the General Government Accounts, where the seasonal adjustment of the direct estimates is performed through the TRAMO-SEATS programs.

6.3 Gross operating surplus & mixed income

Given the lack of data on Gross operating surplus & mixed income, this component is calculated as a residual item of the balancing with the GDP in production approach.

Chapter 7: Population and employment

7.1 Population

Population is the quarterly average number of persons present in the economic territory of a country. By convention, the economic territory includes embassies, military bases and ships and aircraft abroad. On a given date, the total population of a country consists of all persons, national or foreign, who are permanently settled in the economic territory of the country, even if they are temporarily absent from it. In Cyprus, population data refer to the Government controlled area.

Population estimates are based on Census figures, which are updated annually to take account of the components of change, births, deaths and net migration. Intercensal estimates are revised when new Census figures become available. Population estimates for the period 2002-2011 have been revised on the basis of the results of the last Census of Population in 2011.

For ANA, the average population is used, calculated as the average of the population as at 1st January of two successive years. Monthly population estimates are also compiled, by using the component method. The quarterly population figure is taken as the average of the population as at the beginning and the end of each quarter (i.e. average of 1st January and 31st March).

7.2 Employment: persons

The original source for the estimations of the Employment is the Employment and Vacancy Survey. The survey provides an estimate of the total number of persons employed by division of NACE Rev.2-2-digit codes (employees).

Moreover, additional data sources used are the Labour Force Survey (LFS) and the Social Insurance Registry.

For the economic activities of NACE O and NACE A the number of employees is provided by administrative sources (Treasury of the Republic of Cyprus and the Social Insurance Registry).

Employment Survey is conducted quarterly and covers all enterprises employing 30 or more employees and a sample of 1000 smaller enterprises. It is a telephone survey on establishments which is supplemented by administrative data for persons employed by government (employing almost 15% of the persons employed).

Labour Force Survey is conducted on a quarterly basis and covers people (not jobs) that live in a household or intend to live in a household in Cyprus, for at least a year. This data is corrected by using the following coverage adjustments to be consistent with the national account's concepts:

- a) Turkish-Cypriots who reside in Cyprus (in the areas not controlled by the Government) and come to the Government controlled areas for employment, are added
- b) Foreign workers that work in farms on a short-term basis (less than a year) are added in NACE A
- c) Foreign workers that work in the tourist industry on a short-term basis (less than a year) are added in NACE I.
- d) Monks and nuns are added because they do not live in households
- e) Conscripts in the National Guard are added to NACE O since they are not covered by the survey
- f) People that work on ships that are owned by Cypriot companies with headquarters in Cyprus are added

7.3 Actual Hours worked

For the calculation of hours worked, the number of persons for each NACE activity is multiplied by the weekly actual average hours worked, for which are considered the benchmark year of Labor Cost Survey (LCS), the previews quarter and the change trend of Labour Force Survey (LFS). The result is multiplied by thirteen (13) that are the weeks of the quarter.

Chapter 8: Flash Estimates

To satisfy the continuously increasing demand from both foreign and local users and at the same time to comply with ESA 2010 transmission program, CYSTAT produces an earliest picture of the economy based on preliminary data as soon as possible after the end of the quarter, by using a more incomplete set of information than the one used in the regular QNA estimation.

Flash estimates of GDP and employment are considered important for the reason that, they are diffused to the users earlier than the analytical QNA estimations.

8.1 Flash GDP estimate

Methodology used for producing GDP flash estimate is as close as possible to the one used for the regular production of analytical QNA estimates. This approach ensures consistency with the regular QNA production at t+2 months and also coherence with the analytical QNA estimates of production and expenditure approach.

Given the use of an indirect approach to QNA estimation, forecasting using ARIMA models is applied to related indicators in case of missing data. Any other relevant information along with the forecasts obtained, replace the missing values of the indicators and enter into the Chow-Lin's procedure.

Bearing in mind the relative importance of the sectors, the availability of the indicators within the fixed-lag of 45 days is examined and presented in the table 8.1.1 below. Some of the indicators are monthly, while some others are quarterly; the aim of this analysis is to determine how much information is available on which, QNA Production System (QNAPS) could rely on at 45 days from the end of the reference quarter. Table below presents the volume indicators used for each sector along with some useful information on the time of availability of these indicators.

Table 8.1: Short-term indicators used for flash GDP estimate

Economic Activity (NACE Rev. 2)	Related indicators	Frequency	Available at t+45 days?	Notes
A – Agriculture, forestry and fishing	Hours worked	Quarterly	No	
B – Mining and quarrying	Volume Index of Mining & Quarrying	Monthly	2 out of 3 months	
C – Manufacturing	Volume Index of Manufacturing	Monthly	2 out of 3 months	
D – Electricity, gas, steam and air conditioning supply	Production Volume of Electricity in 000's KWh	Monthly	2 out of 3 months	
E – Water supply; sewerage, waste management and remediation activities	Volume Index of Water supply, sewerage, waste management and remediation activities	Monthly	2 out of 3 months	
F – Construction	Composite Volume Index • Production Volume Index in Construction • Building permits in volume with 9 months time lag	Quarterly	No Yes	Estimation on production volume index is provided from STS
G – Wholesale and retail trade; repair of motor vehicles and motorcycles	Composite Weighted Volume Index • Retail sales volume index • Turnover value index of sales of vehicles (deflated with the cpi of sales of vehicles) • Turnover value index of wholesales (deflated with the price index for imported goods)	Monthly	2 out of 3 months No No	Estimation is provided from STS Estimation is made based on related information

Economic Activity (NACE Rev. 2)	Related indicators	Frequency	Available at t+45 days?	Notes
H – Transportation and storage	Composite Weighted Volume Index • Turnover value index for Land transport (deflated with the harmonised index for land transport) • Turnover value index for Water transport (deflated with CPI on cruises) • Turnover value index for Air transport (deflated with the harmonised index on air transport) • Turnover value index for Warehousing and Supporting activities (deflated with the harmonised total index) • Turnover value index for Postal (deflated with the harmonised index for postal services)	Quarterly	No	Estimation is provided from STS
I – Accommodation and food service activities	Composite Volume Index • Tourists Arrivals • Turnover Restaurant Index (deflated with CPI for Restaurants)	Quarterly	Yes No	Estimation is provided from STS
J – Information and communication	Turnover index for Information & Communication deflated with the CPI for Telecommunication	Quarterly	No	Estimation is provided from STS on Tele-Communication
K64 – Financial Service Activities, except Insurance & pension funding	Index of FISIM & Non-FISIM provided by Central bank and deflated with CPI	Quarterly	No	Estimation is made
K65 – Insurance, reinsurance & pension funding, except compulsory social security	Premiums for Insurances minus Claims	Quarterly	No	Estimation is made

Economic Activity (NACE Rev. 2)	Related indicators	Frequency	Available at t+45 days?	Notes
K66 – Activities auxiliary to financial services and insurance activities	Composite value index • Cyprus Stock Exchange • & Foreign Investment Companies	Quarterly	No	Estimation is made
L– Real Estate Activities	Volume of Dwellings additions	Quarterly	No	Estimation is made
M – Professional, Scientific and Technical Activities	Hours worked	Monthly	Yes	
N – Administrative and Support Service Activities	Hours worked	Monthly	Yes	
O – Public Administration And Defence; Compulsory Social Security	Persons	Monthly	Yes	
P – Education	Hours worked	Monthly	Yes	
Q – Human Health and Social Work Activities	Hours worked	Monthly	Yes	
R – Arts, entertainment and recreation	Hours worked	Monthly	Yes	
S – Other service activities	Hours worked	Monthly	Yes	
T – Activities of households as employers	Hours worked	Monthly	Yes	

The forecasting results, as they are produced by the TRAMO-SEATS programs, are checked against other available sources by that time and they are adjusted accordingly.

The analysis of revision is the most important tool to validate the accuracy of preliminary estimates in quarterly accounts. Comparing the preliminary GDP estimate with the one obtained at t+2 months allows CYPSTAT to evaluate the reliability of sources and methods employed at t+45 days.

8.2 Flash employment estimate

Methodology and sources used for producing employment flash estimate are the same to the ones used for the regular production of analytical employment estimates at t+2 months (see section 7.2). The only difference is that the sources available at t+45 days contain provisional information which is then updated/finalized at t+2 months and used for the production of analytical employment estimates for the regular transmission.

Chapter 9: Main Data Sources used

The QNA data sources are discussed extensively in the Chapters 4 to 8. This section provides a summary of the most important sources.

9.1 Production approach

The data sources, for the QNA estimates of the production approach, are mainly the STS along with the price indices available. Administrative data is also used especially for Public sector, Financial Services and for Taxes less Subsidies component. For Services activities, hours worked from LFS is the main source of indicators.

9.2 Expenditure approach

The data sources, for the QNA estimates of the expenditure approach, are mainly the volume retail sales indices of various products of Final Consumption, the employment figures regarding services provided, the BoP data and Trade statistics regarding Imports/Exports and GFCF and the GFS data for government expenditure.