

CYPRUS REPORT – Breaks in the Times Series of LFS data due to the Implementation of IESS Regulation (EU) 2019/1700

As stated in the IESS Framework Regulation, Member States are required to send either corrected figures (covering data from 2009Q1 to 2020Q4) or correction factors, for the 14 Main Indicators of the Labour Force Survey, as a result of the possible impact of the implementation of the new regulation (in 2021) to the LFS data.

The Statistical service of Cyprus (CYSTAT), taking into account this obligation, studied the LFS results of the years before 2021 (old questionnaire) and made a forecast for the 2021 data (Q1 to Q4), based on specific methodology and taking into account also two other explanatory variables.

Specifically, the Registered Unemployment (from the Department of Labour) and the Employment (from the Social Insurance Services) were used as explanatory variables (for each age-group and sex for the 14 Main Indicators), in regression models with ARIMA errors, in order to forecast these indicators.

The p-value of the Breusch-Godfrey test (used to check the autocorrelation of the errors) for lags 1 to 16, the p-value of Lagrange multiplier test and Pormanteau Q-test (used to check the homoscedasticity of the errors) for lags 4, 8, 12, 16, 20, 24 and the p-value of Shapiro test (used to test the normality of the errors) were calculated. Additionally, diagnostics plots for the residuals and for the autocorrelation function of residuals were created.

The tests and plots described above were used to assess the fit of the model. Additionally, a plot with LFS figures and fitted values from the model was created. The estimate for the female of each age group was calculated as the difference between the total estimate and the estimate for male. The forecasts for employed and unemployed for the age-groups 65-74 and 75+ and the forecasts for inactive for all age and sex groups were calculated using an ARIMA model but without using an explanatory variable (since an appropriate explanatory variable was not available).

Therefore, for each of the 14 indicators, a forecast was calculated for the 4 quarters of 2021. Then, adjustment for linearity was applied in order to verify that the estimates for unemployed, employed and inactive sum up to the population estimates given by the Demography Section of CYSTAT. The following two steps were applied:

1. The first step was to adjust the forecast of each age-group /sex so that the sum of the forecasts for all age-groups/sex was equal to the forecast total employed/unemployed/inactive.
2. The second step was to adjust the forecast of employed/unemployed/inactive of each age-group/sex so that the sum of the forecasts of employed, unemployed and inactive in each age-group/sex was equal to the population estimate of the age-group/sex obtained from the Demography Section.

It is important though, to note that the use of the Registered Unemployment for the 2021Q3 and 2021Q4 forecasts was problematic, as due to the COVID-19 pandemic, important changes were made to the practice that the Department of Labour used for the registrations of the unemployed persons, leading to significant differences in figures.

In particular, prior to March 2020 the unemployed persons registered by presenting themselves at the District Labour Offices. From March 2020 to mid-June 2021 the unemployed persons did not need to present themselves at the District Labour Offices but registrations of unemployed people were renewed automatically without their physical presence, due to COVID-19 measures. As from 15th of June onwards, the automatic renewal of registrations was terminated and the registrations had to be done online through an online platform.

These changes in the practice used by the Department of Labour during 2020 and 2021 (two of the most important years that are part of the Break-In-Times-Series exercise), resulted in problematic Registered Unemployment figures. As a result, for 2021Q3 and 2021Q4, a forecast of the Registered Unemployment was used instead.

In summary the results are as follows:

The overall analysis shows very small differences when comparing the forecasted values of 2021Q1 and 2021Q2 with the real values. These numbers are below the standard errors, of both employment and unemployment which indicates that the implementation of the new questionnaire did not have an impact on the figures of employment and unemployment. If there was an impact, this should have been detected in these two quarters.

Additionally, employment estimates, changed after adjustment for linearity (note that inactive persons were estimated without an explanatory variable in the model, since such a variable was not available) and it is believed that the differences that appeared in estimates, before correction for linearity, reflect the outcome of the coronavirus on the labour force, and not the questionnaire's changes due to the new regulation. More specifically, there was a decrease in LFS employment in 2021Q1, and then a rapid increase in 2021Q2. This was caused by the fact that there was a lockdown in January 2021, many businesses also remained closed in February and March, causing these changes that could not be predicted by the model.

On the other hand, when comparing some of the forecasted values of 2021Q3 with the real ones, bigger differences are observed. More precisely, the forecasted unemployment for 25-64 age-group females is higher than the real one (overestimated) while the forecasted employment for 25-64 as well as for 20-64 age-groups females are lower than the real ones (underestimated). This is explained by the following reasons:

- The explanatory variables used for the forecasted values of 2021Q3 could not be used, as already stated before. Therefore the forecast of 2021Q3 is not as accurate as those of 2021Q1 and 2021Q2.
- The real values of employment and unemployment, in 2021Q3, have changed significantly compared to 2021Q2, due to the reopening of the businesses that were previously closed (or were operating partially) because of the COVID-19 pandemic. The reopening of the businesses led to an increase in employment and a decrease

in unemployment, since persons that were not working for a significant period of time returned back to work. This significant change between 2021Q2 and 2021Q3 was not a normal situation.

- Both 2020 and 2021 are two very unusual years, and that is something that the forecast model could not have predicted. Therefore the comparison is problematic.

In general, the changes of the LFS, due to the implementation of the new questionnaire in 2021, under the IESS Regulation (EU) 2019/1700 are as follows:

Employed - up to 2020

(persons 15 years and over)

(a) Persons who during the reference week worked for at least 1 hour for pay or profit. Unpaid family workers are also included.

(b) Persons who had a job from which they were temporarily absent during the reference week:

- due to sick leave or maternity or paternity leave,
- due to other reasons with duration of absence 3 months or less,
- due to other reasons with duration of absence longer than 3 months and receiving at least 50% of their salary.

Unemployed - up to 2020

(persons 15 - 74 years old)

- Persons who do not meet the criteria for employment (above)

and

- are available to start work within 2 weeks

and

- seeking for a job or have already found a job which will start within a period of at most 3 months.

Employed - as from 2021 onwards

(persons 15 - 89 years old)

(a) Persons who during the reference week worked for at least 1 hour for pay or profit. Unpaid family workers are also included.

(b) Persons who had a job from which they were temporarily absent during the reference week:

- due to holidays or leave, working time arrangements, sick leave, maternity or paternity leave or job related training,
- due to other reasons with duration of absence 3 months or less,
- seasonal workers who continue to perform regular duties for their job during the off-season.

Unemployed - as from 2021 onwards

(persons 15 - 74 years old)

- Persons who do not meet the criteria for employment (above)

and

- are available to start work within 2 weeks

and

- are actively seeking for a job or have already found a job which will start within a period of at most 3 months.

It seems that the above changes for employment and unemployment, cancel each other out. Therefore the overall figures did not show any break in the series.

Additionally, it should be noted that no other changes were made due to the implementation of the new regulation (for example, the concept of fixed reference weeks, that is now more clearly defined though the IESS Regulation, was already used prior to 2021, the data collection

modes before and after the new regulation are the same, also the weighting methodology did not change). Therefore, there was no deviation from the previous situation.

Taking into account all the above, we conclude that the implementation of the new regulation as from 2021 onwards did not have any impact on the LFS results.

On the contrary, the COVID-19 pandemic had affected both employment and unemployment, as the measures taken by the government for the restraint of the pandemic have affected businesses of various economic activities, (i.e. total or partial suspension of operation). As a result, persons employed in these businesses did not work for a significant period of time (more than 3 months) and therefore were not considered as employed. Additionally, persons who were not employed were not actively seeking for work (since there were no jobs) although they were available to work within 2 weeks following the reference week and hence were not considered as unemployed.

Finally, it is obvious that abrupt changes in the data have occurred in 2020 and 2021, indicating that the COVID-19 pandemic had impacted the LFS results and both these years were dramatically affected. It is also important not to extend this in the back series data.