MONTHLY LFS DATA IN THE CZECH REPUBLIC

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Abstract

The history of monthly processing data from the Labour Force Survey (LFS) is very short. From 1993 to 2012 the Czech Republic produced only quarterly, not monthly data. The monthly unemployment rate was calculated for the purpose of Eurostat from quarterly results and administrative sources (registered unemployment rate from The Ministry of Labour and Social Affairs). The Czech Republic started with the monthly processing of LFS data in 2012. At present, thirteen member states obtain monthly unemployment estimates directly from the LFS as the only source. Before implementing the regular monthly data processing there were several options. Three basic methods are used in the current methodology of monthly processing: a direct calculation from the raw LFS data applying the same methodology as the quarterly processing, the three-month moving average using the last available three months and regression composite estimation. The analysis showed that regression composite estimation is the most suitable variant for monthly processing in the Czech Republic.

Keywords: Monthly unemployment rate, Labour Force Survey, Regression composite estimation

JEL code : J1, J4

Introuduction

The European monthly unemployment data are the most consulted of Eurostat's statistics. This is a sign that the topic is of interest, but also that the figures provide good information to users and are perceived as being of good quality (Massarelli, 2013).

The Labour Force Survey (LFS) as the main input source for the European monthly unemployment data ensures a high degree of cross-country comparability for these statistics, at least as regards the level of unemployment and of the unemployment rate and the mid-to-long term development. However, the LFS is primarily designed to give reliable quarterly results, not monthly results. For this statistics the longitudinal view is important (for example Halpern-Manners and Warren, 2012, Jones and Riddell, 1995). That means, for instance, what the probability value that an employed person would become an unemployed person during

the next period is (for example Ching-Yang and Hiroaki, 2012, Urwin and Shackleton, 1999, O'Conell at al., 2012). It is the important that every individual of the sample bears the weight over the entire reference period (Atkinson and Micklewright, 1991).

The LFS is performed in a continuous manner on the territory of the Czech Republic; the evaluation of results is carried out at respective calendar quarters (for example Employment and Unemployment in the Czech Republic, 2013). The aim is to inform about the level and structure of employment, unemployment and underemployment in the Czech Republic measured in compliance with international definitions and recommendations by the International Labour Organization (ILO). The definitions and contents of all Labour Force Survey indicators requested by Eurostat are fully applied and respected in the Czech Labour Force Survey (EU Labour Force Survey. Explanatory Notes, 2013).

At present, thirteen Member States obtain monthly unemployment estimates directly from the LFS as the only source. The accuracy of these figures of course depends on the quality of the LFS with regard to estimates of monthly frequency. There are a few options for processing of pure monthly data which are usually used in these thirteen Member States. Austria, the Czech Republic, Denmark, Germany, Greece, Italy, Finland, Romania and Sweden, countries which base the monthly estimates only on the LFS, calibrate single-month samples but using different estimators (e.g. Italy and the Czech Republic use a regression composite estimator, which makes use of the past information at a distance of 3 and/or 12 months, to reduce the volatility of the monthly samples). Estonia, Hungary and the United Kingdom calibrate 3-month rolling samples, while the Netherlands estimate monthly data by a structural time-series model (Massarelli, 2013).

The other countries do not use the direct LFS data for calculation of monthly data. For the monthly unemployment rate the mixed method from computation of several sources of data is used. In most cases the quarterly LFS is taken as a basic source and administrative data (monthly period) as a tool for the current development. But naturally the preference of Eurostat is using LFS as the only source.

1. Quality of LFS data

Sample surveys are usually connected with sampling and non-sampling errors. Sampling errors are expressed by the confidence intervals. The confidence intervals are intervals built around the point estimate in such a way that there is a certain probability that the value of the estimated characteristic is just within this interval. The most widely used is a

95% confidence interval, i.e. an interval within which the actual value of the estimated characteristic is found with 95% probability.

Non-sampling errors are a result, for instance, of administrative drop-outs of dwellings out of the sample, intentional non-response or errors produced by filling in the questionnaire (Employment and Unemployment in the Czech Republic, 2013). For example the interviewer's errors are associated with effects on respondents' answers stemming from different ways in which interviewers administer the same survey (Measurement Errors in Surveys, 1991). But once we begin to consider the possibility of alternative wordings, we seem to presume that there is something of which they are alternative versions: an abstract question that we can ask in different ways (The Psychology of Survey Response, 2000). The respondent error shows that different respondents have been found to provide data with different amount of error, because of different cognitive abilities or differential motivation to answer the questions well (Measurement Errors in Surveys, 1991). The meaning that we get from a word or a sentence must be relatively stable across people (The Psychology of Survey Response, 2000). The interpretation of a sentence has to be at least somewhat immune to differences in the amount of knowledge about the concepts.

2. Methodology of Labour status

The Labour Force Survey (LFS) is the main data source to analyse the Labour status, of which it is the main indicator monitoring basic changes on the labour market, from which other basic statistical indicators as the unemployment rate, employment rate, participation rate are derived from.

For the purposes of the LFS, the concept of work is used for work taking at least one hour in the reference week. Apprentices who receive wage, salary or remuneration like other persons are also considered employed. The same holds for students, horsepersons and other persons engaged above all in other than economic activities and, on top of that, employed in the reference period. On the other hand, persons on parental leave whose status is of a different nature according to the ILO methodology are not automatically included in the group of the employed.

The unemployed comprise all persons aged 15 and over who meet three conditions: they are not employed, are actively seeking job and are currently available for work. The active form of seeking a job includes registration with the labour office of private employment exchange, seeking a job direct in enterprises, placing or answering advertisement and so on (for example Employment and Unemployment in the Czech Republic, 2013).

Unless the persons are employed and do not meet at least one of the three conditions above, they are classified as economically inactive.

3. Implementation of monthly unemployment rate from the LFS data in the Czech Republic

The Czech Republic started with the monthly processing of the LFS data in 2012. Before the implementing of the regular data monthly processing there were several options which model for monthly computing used.

1. Direct calculation from the raw LFS data applying the same methodology as the quarterly processing. As the LFS is based on quarterly frequency, it can generate errors and there is a small sample being surveyed. There is no overlap between adjacent months.
2. The three-month moving average using the last available three months. There is a larger sample being surveyed, but the calculation is not suitable for the short-term analyses.
3. Regression composite estimation. The calculation is stable, it does not use external information and is consistent with the current calculation of the quarterly indicators.

For monthly processing data, reference weeks are selected according to the following condition – at least one day of the reference week is involved in the relevant month. Only surveyed persons are processed.

Picture 1 Direct monthly calculation of population weights is calculated by these variables

	X1 – X24
NUTS-3 regions (1..14)	Population by gender and age classes (12 groups)

The three-month moving average using the last available three months, so the development of this indicator is smoother. Naturally, there are some disadvantages. This indicator is not able to give a true picture of actual changes on the labour market. The other problem is with the last observation because we must estimate the level of unemployment in month+1.

Fig. 1 Unemployment rate 15-64 years (%) - comparison of three-month moving average data with raw data seasonally adjusted
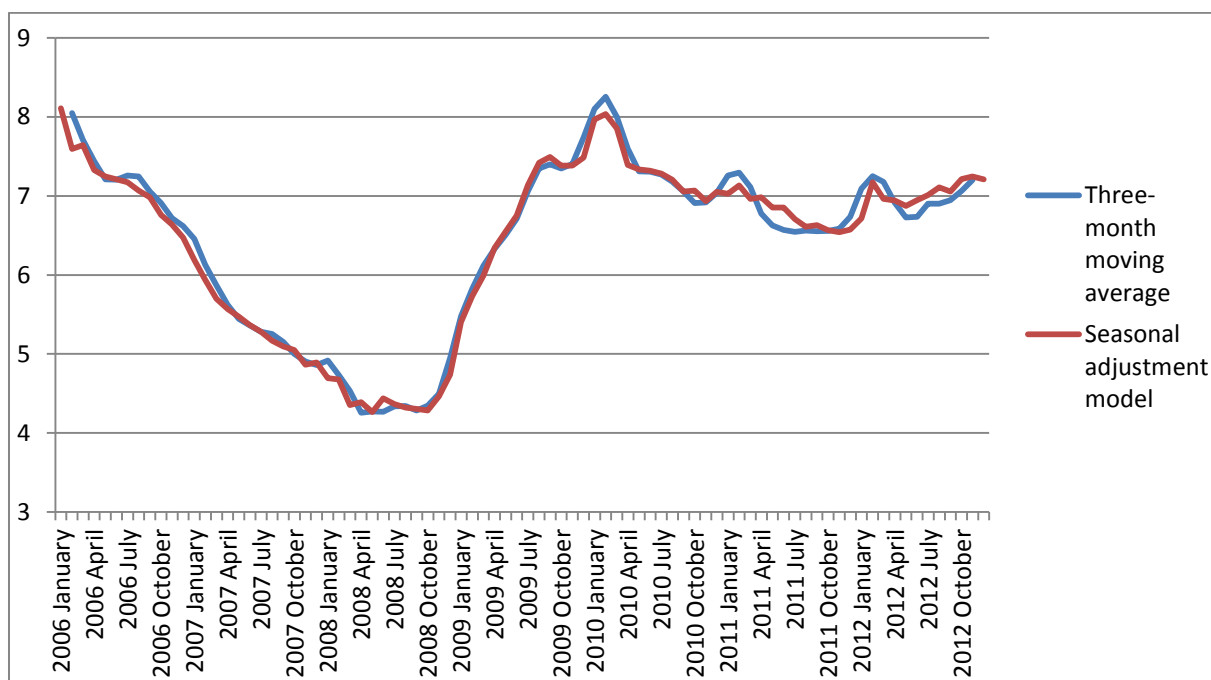
Source: CZSO-LFS

The level of the unemployment rate is different according to the source of data. Generally in the Czech Republic the registered unemployment rate according to the Ministry of Labour and Social Affairs (MoLSA) is higher than the unemployment rate according to the Labour Force Survey (LFS). The definition of an unemployed person in the Labour Force Survey is stricter but the development of both unemployment rates is quite similar.

Fig. 2 Comparison of monthly unemployment rate (%) by CZSO (moving average method) with MoLSA data (15+)
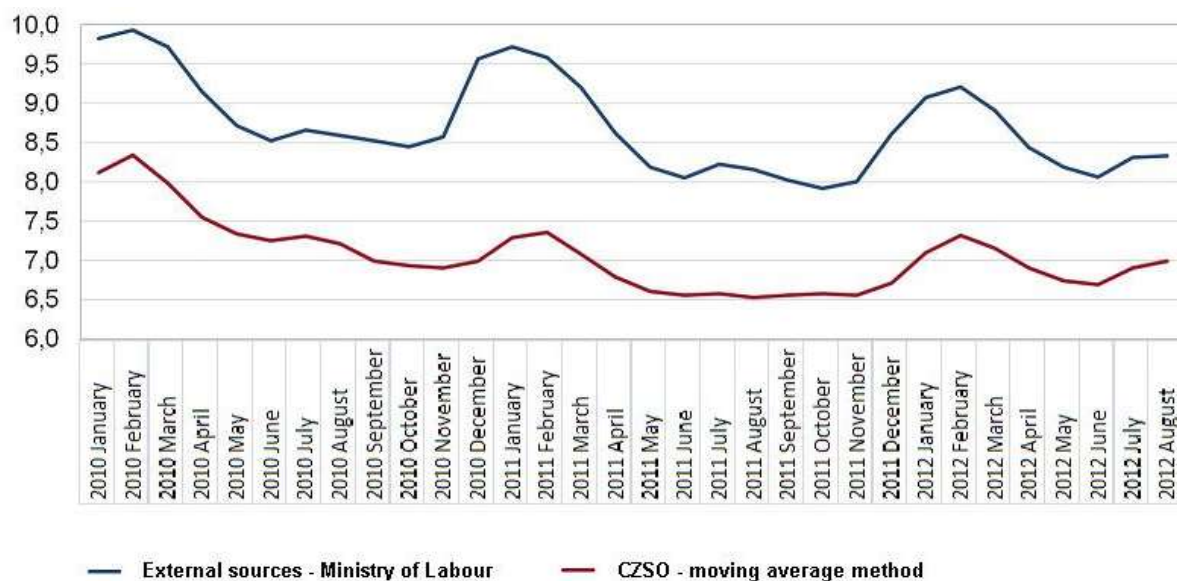
Source: CZSO – LFS, MoLSA

As it was mentioned in the introduction, the LFS questionnaire enables to survey persons in five consecutive quarters. On the basis of the data obtained the Labour Status of persons can be compiled for the period of one year. This way defines labour status career from the basis of longitudinal studies consisting in monitoring of changes at respective persons over time.

Picture 2 Rotation scheme of LFS

1quarter2012	a5	b4	c3	d2	e1							
2quarter2012		b5	c4	d3	e2	f1						
3quarter2012			c5	d4	e3	f2	g1					
4quarter2012				d5	e4	f3	g2	h1				
1quarter2013					e5	f4	g3	h2	i1			
2quarter2013						f5	g4	h3	i2	j1		
3quarter2013							g5	h4	i3	j2	k1	
4quarter2013								h5	i4	j3	k2	l1

The method can be used for repeated surveys with partially overlapping samples. The method is used to improve the level of research in time and changes over time. It is based on a monthly data selection and overlapping data from the previous period (quarter). Sample units remain in the survey during 5 consecutive quarters, the quarter-to-quarter overlap is 80% and the year-to-year overlap is 20%.

The weight is calculated according to these demographic variables: NUTS3 region, gender, 14 age groups. Furthermore, the approach compares employment and unemployment with a previous period. This information is used for the overlapping of choice in 80% from the previous period to ensure the trend components of the calculation.

Picture 3 Table of auxiliary variables used for calibration

X1 – X336		
Population by NUTS-3 regions, by gender and 14 age classes	Employed at t-3 by NUTS-3 regions, by gender and 14 age classes	Unemployed at t-3 by NUTS-3 regions, by gender and 14 age classes
constraints are the same as for Monthly calibration estimator	specific constraints based on information on the previous condition (3 months before)	

The regression estimate takes specific variables as a linear combination between the estimate of the level and the estimate of the changes. These variables are recalculated on population structure in the current month.

We ensure the consistency between monthly and quarterly data using the combination of Labour Status x Gender x Age groups (0-14, 15-24, 25-34, 35-44, 45-54, 55 years or more). We use the traditional indirect approach according to the model of Eurostat via program Demetra. The seasonal adjustment is that the identification and the estimation of the models are done once a year. This means that we freeze the parameters (models and coefficients) for a whole year and we change the parameters in January of the next year.

Historically, the Czech Statistical Office has produced the quarterly news releases (CZSO. News Releases – quarterly, 2013) and from January 2013 has produced also the monthly releases (CZSO. News Releases – monthly, 2013) with recalculation of monthly data to 1998. Eurostat takes the Czech monthly data for computing of the unemployment rate 15-74 years by the gender and age groups (Eurostat. New Releases, 2013).

Conclusion

The LFS is primarily designed to give reliable quarterly results, not monthly results and the history of monthly processing data from the Labour Force Survey (LFS) is very short. From 1993 to 2012 the Czech Republic produced only quarterly data, not monthly data. The European monthly unemployment data are the most popular Eurostat's statistics, so there is a great pressure for processing data on the national level. At present time there are several options for processing of monthly data. It is possible to use the direct calculation from the raw

LFS data applying the same methodology as the quarterly processing but it can generate errors because there is a small sample being surveyed. The three-month moving average using the last available three month is favourable in the United Kingdom, Hungary or Estonia. But for the case of the Czech Republic the most suitable method is the using of the Regression composite estimation. The calculation is stable and consistent with the current calculation of the quarterly indicators.

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