TWINNING CONTRACT

JO/13/ENP/ST/23

Strengthening the capabilities of the Department of Statistics in Jordan

MISSION REPORT

on

Activity: 2.4 Training in seasonal adjustment

Mission carried out by
Roberto Iannaccone, ISTAT
Nigel Stuttard, NI-CO

18-22 May 2014

Version: Final

Expert contact information

Roberto Iannaccone
Istat
Via Cesare Balbo 16
IT-00184Roma
Italy
Tel:
Email:

Nigel Stuttard
NICO
Landmark House
5 Cromac Quay
Belfast, BT7 2JD
United Kingdom
Tel: +44 1708 221318
Email: nanddstuttard@hotmail.co.uk

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List of Abbreviations

DoS   Department of Statistics of Jordan
ToR   Terms of Reference

1. General comments

This mission report was prepared within the Twinning Project "Strengthening the capabilities of the Department of Statistics in Jordan". It was the first mission to be devoted to Seasonal Adjustment within Component 2 of the project.

The purposes of the mission were:
- To understand what seasonal adjustment is and why it is useful;
- To understand the two main approaches to seasonal adjustment, namely X-12-ARIMA and Tramo-Seats;
- To give practical experience in the use of JDemetra+, the EU-developed software that incorporates both of these approaches;
- To give insight into the issues surrounding the use of seasonal adjustment and the ways of dealing with these issues with reference to the ESS Guidelines on Seasonal Adjustment.
  .

The consultants would like to express their thanks to all officials and individuals met for the kind support and valuable information which they received during the stay in Jordan and which highly facilitated the work of the consultant.

The views and observations stated in this report are those of the consultants and do not necessarily correspond to the views of EU, DoS, Istat or NI-CO.

2. Assessment and results

Preliminary discussion with the course participants established that seasonal adjustment is not currently used in DoS but that the department did produce short-term indicators to which seasonal adjustment could be applied.

The seasonal adjustment of a time series involves the identification and removal of the seasonal component, that is those variations associated with the time of year and/or the arrangement of the calendar, from a time series. Its primary purpose is to allow users to understand more clearly the underlying movements in short-term indicators. Month-on-month (or quarter-on-quarter) measures of growth provide a more timely measure of what is happening in the economy than year-on-year measures.

The two main software packages used in official statistics to carry out seasonal adjustment are X-12-ARIMA, developed by the US Bureau of Census, and Tramo-Seats, developed by Agustin Maravall of the Bank of Spain. These packages use different approaches to seasonal adjustment, one non-parametric, one parametric, although they have borrowed from each other in recent years. Recently, Eurostat developed a software package, JDemetra+, that incorporates both approaches in a single Windows package that allows the user a choice between the two approaches and provides extensive graphical and diagnostic information.

The mission aimed to explain to the participants the different steps involved in seasonal adjustment:
- the preliminary analysis of the time series;
- the use of models to both forecast and 'clean' the series:
- the decomposition of the series into separate components that allows the removal of the seasonal component;
- the use of diagnostics to assess the quality of the seasonal adjustment.

Although JDemetra+ can carry out most of these steps automatically, seasonal adjustment does require judgment from the user so it is important to understand how the software works and what the output shows.

Participants were given practice with the software:
- to input data;
- to carry out the different steps of the seasonal adjustment process;
- to read and evaluate the output from the different processes.

Participants were introduced to the ESS Guidelines in Seasonal Adjustment. This booklet aims to present the theoretical aspects and practical implementation issues in a friendly and easy to read framework and is aimed at both non-experts and experts of seasonal adjustment. The participants' attention was drawn to some issues which need to be addressed within any organisation using seasonal adjustment, namely revisions, aggregation and short time series.

3. Conclusions and recommendations

There is no tradition of producing seasonally adjusted data either within Jordan or in the region as a whole. This means that the producers and users of statistics will need to go on a learning curve before they are in a position to produce and use information in this form. One way forward is for the department to start to produce seasonally adjusted versions of some of the more important short-term indicators, first for internal use and then for external use as experimental statistics. It should be noted that it is good practice to publish both seasonally adjusted and non-seasonally adjusted versions of time series to meet different users' needs.

The way in which seasonal adjustment is managed within National Statistical Institutions varies between countries. Some countries, including the UK, operate a centralised system, in which a group of seasonal adjustment experts work with the production branches to advise on how best to seasonally adjust the different series. Other countries, including Italy, operate a decentralised system in which each production branch is responsible for the seasonal adjustment of all of its series. On balance, we think that a centralised approach would be most suitable for Jordan. One advantage of this approach is that a small group of staff could be given the opportunity to develop expertise in the area. They would then be able to champion seasonal adjustment across the office and promote and support good practice.

Arrangements of the calendar, for example the number of working days in a month or the timing of national holidays, have an impact on economic time series. This effect needs to be removed as part of seasonal adjustment. Often these arrangements, known collectively as calendar effects, are specific to a particular country. JDemetra+ has a default calendar of regressors built in and allows the user to modify the regressors by constructing a calendar that incorporates the holidays and special events of a particular country. The DoS will need to build such a calendar for Jordan. This is not an easy task particularly as the calendar will need to take into account any effects associated with Ramadan. However, the linked paper by N A Kocak of the Turkish Statistical Institute provides a very useful description of how this has been done in Turkey.

Introducing seasonal adjustment can appear to be a daunting task. There are some difficult issues, revisions policy and aggregation, for example, that are not easily resolved. However, a number of the newer members of the European Union have introduced seasonal adjustment in recent years and JDemetra+ has made it easier for those new to the field to get started.

Action	Deadline	Responsible person
DoS start to produce seasonal adjusted series, initially for internal use and then for external use on an experimental basis.		6
Develop a centre of expertise for seasonal adjustment.		
Develop a calendar of regressors for Jordan.		

Annex 1. Terms of Reference

Course on Seasonal Adjustment
EU Twinning Project JO/13/ENP/ST/23
18-22 May 2014

Expected output of the activity:
o   Knowledge gained on the state of the art of seasonal adjustment methods
o   Knowledge gained on software solutions using JDemetra+
o   Knowledge gained on X-12-Arima (US Census Bureau)
o   Knowledge gained on Tramo/Seats (Bank of Spain)).
o   Recommendations prepared on how to implement seasonal adjustment calculations in DoS.
o   Transfer of the Italian and United Kingdom, and in general the European Union, experience in seasonal adjustment

18th May 2014
Brief overview of Time Series Analysis (carried out with examples and exercises):
–   General characteristics of Time Series
–   Preliminary analysis of Time Series: Plots
–   Preliminary analysis of Time Series: Stationarity
–   Preliminary analysis of Time Series: Transformations

Why to seasonally adjust time series?:
–   Presentation of STS regulation;
–   Presentation of EU Guidelines on seasonal adjustment.

19th May 2014

How to carry out the seasonal adjustment?
–   Unobserved component in time series
–   Different approaches for seasonal adjustment
–   Sofware: Tramo Seats vs X12-ARIMA, JDemetra+

Really short description of models for time series (from white noises to Reg-Arima models) – Part 1

20th May 2014

–   Really short description of models for time series (from white noises to Reg-Arima models) – Part 2
–   Calendar Effect and its components, Outlier
–   Really short description of background for X12-Arima
–   Using JDemetra+ (Part 1 - carried out with examples and exercises)
    o   How to create input
    o   How to seasonal adjust

o   Calendar Adjustment

21st May 2014

Using JDemetra+ Part 2
   o   Outliers
   o   How to read output
         ▪   Plot
         ▪   Revision History
         ▪   Sliding spans
         ▪   Test
   o   Exercises with real time series

22nd May 2014

Discussion on open problems
   –   Revisions
   –   Aggregation

Annex 2. Persons met

<u>DoS:</u>

Mr Abed Wadood Matouk; Project Leader

Methodologies and Statistical Techniques Directorate:
 Mrs Ghaida Khasawneh, Head of Sampling Division (component leader)
 Mr Abd Alnaser Aljarere, Statistician in Sampling Division
 Mr Abdullah mostafa, Statistician Assistant in sampling Division
 Mr Ayman AlQasem, Statistician in Frames Division

Economic Directorate:
 Mr Khaled AlZeitawi, Head of Internal Trade Division
 Mr Firas Mesleh , Head of Service & Finance Division

Agricultural Directorate:
 Mr Raed Smadi, Statistician in Crops Production Division
 Ms Hanan Alshabkeh, Statistician in Live Stock Production Division
 Ms Munia AlBasti, Statistician in Agricultural Economy Division

Directorate of National Accounts:

 Mr Walid Battah , Head of Quarterly Accounts Division
 Mr Jaber AlFazza, Statistician in Quarterly Accounts Division

<u>RTA Team:</u>

Mr Thomas Olsen, Resident Twinning Adviser (RTA)
Ms Amal Aliah, RTA assistant
Mr. Emad Talafha, Interpreter
Ms Ahlam Jaradat, Interpreter
Mr Khalid Jradat, Interpreter