

# **TWINNING CONTRACT**

**JO/13/ENP/ST/23**

## **Strengthening the capabilities of the Department of Statistics in Jordan**



### **MISSION REPORT**

**on**

#### **Activity 1.9: Supply and Use Tables and Its Relation to Input-Output Tables**

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## List of Abbreviations

DoS	Department of Statistics of Jordan
ToR	Terms of Reference
SUT	Supply and Use matrices
VAT	Value added tax (the general sales tax)
NA-products	National accounts products (the product classification used in the SUT)
FOB	Free on board
CIF	Cost, insurance, freight
IOT	Input-output table
GVA	Gross Value Added

## 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 seventh mission to be devoted to national accounts within Component 1 of the project.

The main purposes of the mission were:

- To continue training of the DoS staff so they during active balancing work become familiar with the balancing technique towards Industry and other target totals
- To introduce how automatic balancing can be used as a tool for final balancing of the SUT
- To make a first version of a completely balanced SUT for 2010
- To prepare the compilation of an Input-Output table on the basis of the balanced SUT

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

The views and observations stated in this report are those of the consultants and do not necessarily correspond to the views of EU, DoS or Statistics Denmark.

## 2. Assessment and results

The December-mission concentrated on the second step in the manual balancing of the SUT: The balancing towards target totals. The goal was to complete this part of the balancing process during the mission and leave the final (more automatically) balancing procedure to this January-mission.

During the December-mission we discussed some of the outstanding issues concerning the target totals but were only able to solve some of the problems. Some specific problems in connection with "medical tourism", phosphates and a big manufacturer of electronic machinery were left unsolved. Instead we urged DoS to arrange meetings with relevant persons from the Jordan central bank and the Ministry of Finance to get a better understanding of the figures.

In addition to this, the independent calculations of the informal economy, that is part of this component of the twinning project, also had to be taken into account.

While some additions to output from specific industries clearly were covering informal activity others were not and the necessity of a more systematic compilation approach towards the coverage of the informal activity was needed. In order to make these compilations, it was therefore crucial that the remaining calculations for the informal economy in accordance with the recommendations from ISTAT should be finalized and sent to the Danish experts by the end of 2014.

Following the method proposed by the experts from ISTAT, the DoS had calculated estimates of unobserved gross value added (GVA) distributed by industries, but with considerably less detail than the industry classification used in the SUT-framework for manufacturing and service industries. The Danish experts worked out a proposal for the further breakdown of unobserved GVA. It took into account that in certain areas observed supply seemed unable to cover the uses, but was mostly based on

the experience that certain industries usually contain many small informal units and – where other information was unavailable – on pure common sense.

To be useful for the SUT, the estimated values of GVA were supplemented by estimated values of intermediate consumption and output from the informal units. Finally the estimated output values for each industry had to be distributed by national accounts products.

This mission began with a discussion of the new Target totals, compiled by the Danish experts, where the new figures for the informal economy were taken into account. With a new set of Target Totals, the balancing towards the Targets could be continued. Repeating the balancing methodology with balancing techniques and the common rules for balancing, time was devoted to balancing work by the desks thereby training the Dos staff in the balancing towards Industry targets and other Target totals.

At the same time, the experts and a few people from DoS attended two prearranged meetings with people from the Jordan central bank and the Ministry of Finance (see Annex 3 with Persons met). First we met with relevant people from Jordan Central Bank.

The purpose of the meeting was to get more information about the figures for import and export of services. When trying to balance services, we faced the problem that the 2010 balance of payment presupposes an export of government services that exceeds the sales revenue shown as output from general government. The people from the central bank gave a clear description of their calculations and a result from the meeting was an updated and more detailed specification of the figures for export of transport services. The Central bank staff would look forward to receive the results from DoS's work on SUTs and I-O tables.

In the meeting in the Ministry of Finance we tried to get an impression of how government output is calculated. It turned up, however, that the immediately available information about the public budgets was not easily comparable with the figures that lies behind the figures used for national accounts and a number of questions were still left unanswered. It could clearly be recommended that a kind of agreement is established between the Central Bank and the Ministry of Finance on the size and sort of exported government services.

A specific problem is the size of “medical tourism” in Jordan by non-residents. There seemed to be agreement between the Central Bank and Ministry of Finance that some figures circulating on the internet are exaggerated or could include services that are not really health-related. On the other hand it should still be investigated whether the supply of services for travellers can be consistent with the more moderate estimates by, for instance, the US Department of Commerce.

Despite such outstanding issues the plan was followed: To present a first version of a balanced SUT at the end of the mission. Before this could be done it was necessary to introduce some corrections to the original figures for import of goods and to perform a number of supplementary adjustments to the columns of intermediary consumption. Final adjustments to ensure that supply is equal to use for trade margins, taxes and VAT could then be performed using the build-in facilities of the Excel macro-system.

It was underlined that this first balanced version of the SUT for 2010 would need to be looked through thoroughly and that changes caused by the above mentioned unsolved issues may still lead to significant changes in main aggregates of the national accounts. The first results should preferably be treated with discretion.

During the week we also had the opportunity to discuss the further work on an Input-Output Table (IOT) for Jordan for 2010. Peter Rørmose made an introduction to the compilation of IOT on the basis of supply and use tables.

The extensive work on supply and use tables for Jordan carried out so far has laid a solid foundation for the IOT. In order to compile the same type of IOT as is produced in Denmark and many other countries only a few additional steps are required.

1. In terms of data the supply and use tables covers everything except for Gross Value Added (GVA) by industry. The total GVA by industry is sufficient to close the IOT so the row totals and column totals are equal. However, for analytical purposes later on it is advisable to work with GVA split into three components
  - Other taxes on production, net
  - Compensation of employees
  - Gross operating surplus and mixed income

Data for these three items has been compiled already by the staff, and during the mission they were gathered, aggregated into 60 industries and put together in a table. However, before these data are ready for the IOT they need to be updated with some additions to the compensation of employees as a consequence of the inclusion of the informal sector in the SUT. It will be taken care of by the experts before the next mission.

2. In order to build a bridge between the SUT and IOT it is required that the compiler make one main assumption. In the input-output manuals 4 different assumptions that can be taken, leading to 4 different input-output tables are listed. Two assumptions lead to product by product IOT and the other two assumptions lead to industry by industry IOT. The presentation touched very briefly on the different choices. The experts suggested to follow the Danish way and to make the assumption about “*fixed product sales structure*” which means that it is assumed that “*the relative shares in which a product is supplied (from domestic production industries and import) is the same no matter to which use the product is supplied*”. It will lead to an industry by industry IOT, and complies best with the Danish principles of avoiding as far as possible any alterations of the original data. It is suggested to make the same assumption regarding the Jordanian SUT and thus, to compile an industry by industry IOT.
3. Imports can be represented in an IOT in various ways. In the most advanced tables it is represented by an import matrix with the same dimensions as the domestic matrix of input in production. Alternatively, the same imports can be represented by just a single row. It was decided to work with just one row of imports, but to investigate further what it requires to compile the full table of imports.
4. With all data and the central assumption in place the IOT can be compiled with a few mathematical operations as presented on the first day. The formulas will be explained in more depth on the next mission.
5. When the first version of the IOT is compiled there are just a few things to change and that is primarily a reallocation of the trade margins to the 2 (3) trade industries. More detail about this on the next mission as well.

The software required to compile the IOT was discussed. In principle the calculations can be done in Microsoft Excel, but it is strongly advised to start using some software dedicated to matrix operations. There are a lot of such software available on the market but at very high prices. Therefore it is suggested to start using the free software **R** for compilation of the tables as well as for subsequent modeling and analyses with the data. After R is installed the software RStudio can be installed on top, which gives some additional possibilities.

It can be downloaded from here:

- <http://cran.r-project.org/>
- <http://www.rstudio.com/>

### 3. Conclusions and recommendations

The first version of a balanced SUT will without doubt need some adjustments before it can be presented to a larger public. Among issues that still may lead to changes are:

- The output-value from construction may be changed in the light of available construction materials.
- Some food may still be added to input in general government to take into account the use by military, prisons, hospitals etc.
- The additional household consumption that is in fact consumed by non-residents should be reconsidered in connection with decisions on how to treat medical tourism. Purchases of health services, pharmaceuticals, accommodation and food serving services should be checked for credibility and consistency with the BOP figures for travel.
- The distribution of cars between household consumption and gross fixed capital formation may be validated using any type of information on the number of cars by various types of ownership.
- The gross value added table (usually placed below the columns for intermediate consumption) shall be added to the SUT framework, and consistency with figures for output and input by industries must be ensured by any necessary correction.
- The new main aggregates should be compared to the figures from the previously existing national accounts and major differences between old and new figures should be explained.

With the establishment of the balanced SUT and the GVA data obtained the work on the IOT can begin. The experts will start working on the IOT and hope to present some results at the next mission in the beginning of March 2015. In that light it is hoped that the next mission should contain the following elements

1. Presentation of Jordanian input-output table 2010
2. Introduction to R
3. Careful review of the R-programme for making the IO-table including a discussion of the steps taken to compile the table. The review should conclude with advice about how to compile the table for 2011.
4. Introduction to input-output analysis with an IO-model. Textbook suggestion; [Miller and Blair \(2009\)](#)
5. Analyses with the Jordanian IO-model for 2010
  1. Employment multipliers
  2. CO2 multipliers?
  3. Others

In preparation for the next mission the staff is encouraged to

1. Take a look at the formulas for making the IOT as presented on powerpoints during the January mission and see if they make any sense.
2. Have the software **R** and **RStudio** installed on computers.

***Annex 1. Terms of Reference*****Terms of Reference****EU Twinning Project JO/13/ENP/ST/23****24 -29 January 2015****Component 1: National Accounts****Activity 1.9: Supply and Use Tables and Its Relation to Input-Output Tables****0. Mandatory results and benchmarks for the component**

- The national accounts system in Jordan updated to SNA 2008 (Apr 2015)
- The national accounts system in Jordan will cover the informal sector (Apr 2015)
- Assessment report on current situation (Jan 2014)
- Review of the GDP methodology (Apr 2014)
- Plan for how to change base year in the fixed price calculations (Jan 2015)
- Plan for how to improve the current accounts (Jan 2015)
- Present and discuss the concept of different types of agricultural accounts (Jan 2015)
- Data sources, compilation methods, and balancing in relation to supply and use tables reviewed and updated towards SNA08 principles (Apr 2015)
- Provide recommendations on how to update input-output tables (Apr 2015)
- Update the methodology for calculation the informal sector (Apr 2015)

**1. Purpose of the activity**

- Continued familiarization of the DoS staff with the IT-tool for SUT
- With balanced supply and use for every product
  - To adjust industry inputs and final demand categories in the direction of the target totals
  - To proceed with the final balancing
- To discuss the relationship between SUT and Input-output tables (IO)
  - To identify the steps from the SUT to the IO
  - To identify the data items the SUT needs to be supplemented with
  - To discuss IT-solutions for the compilation of the IO
- Special focus on changes needed in the current system in order to comply with the ESA10/SNA08
- To introduce the DoS staff to requirements regarding supply and use tables and input output tables in the ESA 2010 / SNA2008

**2. Expected output of the activity**

- DoS staff further familiarised with the IT-tool for SUT
- Balanced SUT for the year 2010
- Recommendations prepared on the next steps in relation to going from the SUT to IO
- A lining up of work programme for the next activity (1.10, scheduled for 1 – 5 March 2015)
- DoS staff introduced to the Danish and in general European experiences in compiling Supply and Use tables and Input-Output tables



### **3. Participants**

#### DoS:

Mr Moawiah Alzghoul Director of National Accounts Directorate, and component leader

#### Annual national accounts

Amal Abu Afeefeh - Head of the Annual Accounts Division

Khairallah Almarzoug

Farhan Mohammad

Loay Alrawashdeh

Ali Zaitoun

Aycha Abou Shairah

#### Input-output division

Murad Omari

Aysha Hashim Abu-Shaira

#### Quarterly accounts division

Walid Battah - Head of the Quarterly Accounts Division

Jaber Alfazza

Walaa Gharram

#### MS experts

Mr. Jens Holst Jensen, Senior Adviser, National Accounts division, Statistics Denmark

Mr. Søren Larsen, Senior Adviser, National Accounts division, Statistics Denmark

Mr. Peter Rørmose Jensen, Senior Adviser, National Accounts division, Statistics Denmark

***Annex 2. Programme for the mission***

Time		Place	Event	Purpose / detail
Sunday, morning	08.30 – 10.00	Hotel /DoS	Meeting with RTA	To discuss the programme of the week
Sunday, morning	10.00 – 12.00	DoS	Meeting with BC Component Leader and BC Experts	Information and follow-up on activities since activity 1.14. What is the status regarding the balancing?  Brief introduction to the relationship between SUT and IO.  IT-solutions for the IO work
	12.00 – 01.00		Break / Preparations / Report writing	Break / Preparations / Report writing
Sunday, afternoon	01f.00 – 03.30	DoS	Meeting with BC Component Leader and BC Experts	Work on balancing the SUT and discussions of the link to IO.
	03.30 – 04.00		Preparations / Report writing	Preparations / Report writing
Monday, morning	08.30 – 09.00	DoS	Preparations / Report writing	Preparations / Report writing
	09.00 – 11.00		Meeting with BC Component Leader and BC Experts	Continued from Sunday afternoon.
	11.00 – 12.00		Meeting with the Central Bank	Briefing on work with SUT as well as questions to data from the Central Bank
	12.00 – 01.00		Break / Preparations / Report writing	Break / Preparations / Report writing
Monday, afternoon	01.00 – 03.30	DoS	Meeting with BC Component Leader and BC Experts	Continued from Monday morning.
	03.30 – 04.00		Preparations / Report writing	Preparations / Report writing
Tuesday, morning	08.30 – 09.00	DoS	Preparations / Report writing	Preparations / Report writing
	09.00 – 12.00		Meeting with BC Component Leader and BC Experts	Continued from Monday afternoon.
	12.00 – 01.00		Break / Preparations / Report writing	Break / Preparations / Report writing

Tuesday, afternoon	01.00 – 03.30	DoS	Meeting with BC Component Leader and BC Experts	Continued from Tuesday morning.
	03.30 – 04.00		Preparations / Report writing	Preparations / Report writing
Wednesday, morning	08.30 – 09.00	DoS	Preparations / Report writing	Preparations / Report writing
	09.00 – 12.00		Meeting with BC Component Leader and BC Experts	Continued from Tuesday afternoon.
	12.00 – 01.00		Break / Preparations / Report writing	Break / Preparations / Report writing
Wednesday, afternoon	01.00 – 03.30	DoS	Meeting with BC Component Leader and BC Experts	Continued from Tuesday afternoon.
	03.30 – 04.00		Preparations / Report writing	Preparations / Report writing
Thursday, morning	08.30 – 09.00	DoS	Preparations / Report writing	Preparations / Report writing
	09.00 – 11.30		Meeting with BC Component Leader and BC Experts	Discussions of open issues. Discussions of work programme until next mission (1-5 March 2011)
			Ad-hoc meetings	Final clarifications with BC Experts, preparation of report and presentation for BC Project Leader
Thursday, morning	11.30 – 12.30	DoS	Meeting with BC Component Leader	Presentation for BC Project Leader
Thursday, noon	12.30 – 01.00	DoS	Debriefing with BC Project Leader	Conclusions and decisions and their consequences for the next activity and the implied work programme for BC Experts

### ***Annex 3. Persons met***

#### DoS:

Mr Moawiah Alzghoul Director of National Accounts Directorate, and component leader

#### Annual national accounts

Amal Abu Afeefeh - Head of the Annual Accounts Division

Khairallah Almarzoug

Farhan Mohammad

Loay Alrawashdeh

Ali Zaitoun

Ayman Nasir

#### Input-output division

Murad Omari

Aysha Hashim Abu-Shaira

#### Quarterly accounts division

Walid Battah - Head of the Quarterly Accounts Division

Jaber Alfazza

Walaa Gharram

#### Central Bank of Jordan

Nidal Azzam

Issa Hijazin

Ghada Sharaf

Batoul Dodeen

#### Ministry of Finance

Assemah Doqan

Sahar Qoraan

#### **RTA team**

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RTA Assistant, Christine Salman

Interpreter, Riham Abdelhadi