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LEBANESE 2004-2011
National Accounts

DATA SOURCES AND COMPILATION METHODS

Central Administration of Statistics

General Government

GDP

Imports

Taxes

Commercial trade

Supply use Tables

Banks

Output

Exports

Construction

Supply

Sector Accounts

Agriculture

Margins

Gross Domestic Product (GDP)

Services

Output

Demand

Gross

Constant Prices

Imports

Current Prices

Production

GDP deflator

Final Consumption

Production Accounts

GDP Commercial Trade

Manufacturing

Intermediate Consumption

Volume Indices

Central Administration for Statistics (CAS)

National Accounts of Lebanon: Data sources and compilation methods (2011)

July 2013

A   Introduction

The national accounts of Lebanon comprise a set of statistical tables that describe the structure and evolution of the Lebanese economy as far as it is possible to do. The primary focus is on annual time-series of the gross domestic product (GDP) and its components. There are also partial "sector" accounts (for government and the financial sector).The structure is presented in the form of a Supply-Use Table (SUT) for the year 2011.

This document sets out the various sources of data and the methods used by the Central Administration for Statistics (CAS) to compile the national accounts of Lebanon for 2011 and revised estimates for 2004-10, on the basis of new and additional set of data. In this Section (A), the background is described and issues concerning the scope of the national accounts are discussed. An overview of the main sources of data is presented in Section B.

In Lebanon, as in many countries, there are two main elements in the compilation of GDP:
- a "benchmark" Supply-Use Table (SUT) for a given year
- annual (and possibly quarterly) estimates extrapolating from this benchmark (until another benchmark can be constructed).

Ideally a new benchmark would be prepared at least every five years. However, this depends mainly on quality household budget survey data being available for the year concerned. These methods are described in Sections C and D respectively.

Background

For the period 1997 to 2010, the publication *Economic Accounts of Lebanon* (EAL) was prepared by a unit in the Office of the President of the Council of Ministers. These annual accounts and the estimates of gross domestic product (GDP) in particular, were compiled by establishing "benchmark" estimates for the year 1997 and by using a specific set of available annual statistics to produce estimates for subsequent years.

As the responsibility for preparing and publishing the national accounts was transferred back to CAS in line with government decision, the opportunity was seized to prepare a new benchmark and develop a new system for compiling the estimates annually, based on data previously unavailable or not used - a work done with the help of European Union Twinning project started in 2010 and completed this year under a consultancy funded by UNDP.

International standards

The 2008 edition *United Nations System of National Accounts* (SNA) sets out the latest internationally recognised standards for compiling national accounts. In particular, it provides a powerful framework for producing consistent estimates of the flows of goods and services in the economy. It is important to comply with these standards wherever possible.

However, the SNA was designed primarily for sophisticated economic analysis in large well-developed countries. It describes a comprehensive set of statistics on the interactions of the institutional sectors, using a complex accounting structure. It implies the availability of a wide range of detailed accounting and related data. In practice, the range of data required is rarely available, especially in small emerging economies characterised by large share of informal or unrecorded activity.

The scope of the accounts

The scope of the national accounts and the methods used to compile them depend on several practical factors, including in particular
- the needs of users
- the size and characteristics of the economy
- the resources available to produce the estimates, and
- the availability of data

More than with other types of statistics, compromises are essential in order to provide estimates of adequate quality at reasonable cost. Thus, in Lebanon, while the procedures for compiling the national accounts broadly comply with the main concepts and definitions of the 2008 edition of the SNA, inevitably it is not possible to follow them all precisely. The factors mentioned above are considered briefly in the following paragraphs.

User needs

Starting December 2010, a range of users were consulted as to their views on their need for national accounts. As expected, the primary requirement was for estimates of the level and the growth rate of the GDP (including its main components and related aggregates) that are both timely and reliable. There was particular interest in the performance of the various economic activities that contribute to GDP.

A concern was that only to a limited extent were the existing LEA estimates based on direct measurement of activity. Some users felt that existing GDP estimates overstated reality, while others felt that the GDP understated reality. This concern however was not substantiated by the results of the new, revised estimates, compared to the initial estimates.

A further stated need, for more detailed economic analysis, was for structural data in the form of an input-output table. This is closely related to a "Supply Use Table" (SUT), a framework used by compilers to assemble a wide range of data, leading (after necessary adjustments to ensure a balance between estimates of supply and demand) to benchmark estimates of the level of GDP.

In general the main user requirements emerging from the consultation were for:
- the estimates to be based on more direct measurement of activity, through a wider use of statistical surveys and other data sources
- greater transparency about the methods and data sources used

The economy

Lebanon is a relatively small country with an open economy. It has a resident population of around 4 million.GDP per capita is about $10,000 per year. However, Gross National Disposable Income (GNDI) is thought to be substantially higher, thanks mainly to the remittances of the large non-resident diaspora with family ties to Lebanon. (Because of a lack of sufficiently reliable regular data, it was not possible to make estimates of adequate quality of GNDI.)

To the extent that small businesses operate informally and are not fully captured in the tax system, there is also a problem of measurement. However the SUT framework referred to above does allow the size of it to be roughly estimated even if there is no direct information. Allowances amounting to around an additional 30% were included in the estimates of GDP.

Resources

The Central Administration for Statistics has limited resources. The methodology was therefore designed to minimise the resources required to produce the estimates. The main output is a standard set of tables, together with a brief summary of the highlights. No attempt was made to develop a detailed description of the economy which the *Economic Accounts of Lebanon* contained.

In a small economy, the resources that can be allocated to compiling economic statistics are limited. It is therefore imperative to exploit all possible existing sources of data. Some surveys are essential, to supplement administrative sources, but they are disproportionately costly when compared with those carried out in large economies. No statistical surveys were conducted during this period, except for the Household Budget Survey and the regular collection of price data for the Consumer Price Index (CPI).

Available sources of data

Timely estimates of GDP can only be compiled from readily available data (together with a number of assumptions).After some time, more reliable data may become available on different aspects of the economy and the estimates can then be improved. (This procedure for compiling national accounts is standard practice, inevitably leading to revisions of the earlier estimates. If they occur regularly, analysis of these revisions may be used to improve the way the first estimates are produced.)

Although no new statistical surveys took place during the project period, new sources of data became available and were analysed. These are described in Section B.

B   Data sources

The principal new sources of data used for the first time in Lebanon's national accounts are:

- Value Added Tax (VAT) returns
- the Household Budget Survey for 2011-12
- CAS surveys of enterprises over 2004-08

In addition, the results of the 2007 Survey of Manufacturing carried out by the Ministry of Industry were also referred to and data from business income tax returns for 2010 were analysed. Particular care was taken to preserve the confidentiality of the information provided by individual survey respondents and taxpayers.

Several key types of data are available quickly (and not normally subject to subsequent revision).As in the previous system, the well-established monthly statistics of foreign trade in goods (based on Customs documents) formed a key input to the accounts. Some other indicators, such as the production of cement and electricity, are also available every month.

The VAT statistics mentioned above are available within a few weeks of the end of each quarter. They are based on the returns made quarterly to the VAT Department of the Ministry of Finance by registered traders. The traders are classified by the Ministry of Finance according to their (primary) kind of activity. In Lebanon VAT was introduced in 2002. As this source was not available when the former system of Economic Accounts was set up, it was not used in the EAL.

Data on the budgetary operations of Central Government were also readily available, but the accounts of other Government bodies, including local authorities, cannot be quickly and easily obtained, so partial information had to be extrapolated. The Central Bank provided details of the transactions of the banking sector and of the Balance of Payments.

For crop and livestock production, the traditional source was the Ministry of Agriculture. However, the Ministry was not able to provide estimates for recent years, so data was obtained from CREAL (Centre de Recherche & d'Etudes Agricoles Libanais)**.**

Good quality data on price movements are essential. The CPI produced by CAS since December 2007 was a readily available source. Unit value indices were also derived from the Foreign Trade Statistics. Ideally producer prices would be available, but it has not yet been possible for CAS to establish a regular collection system.

Other important sources of data may not be available readily or regularly. One is a Households Budget Survey. Households Budget surveys are expensive and few countries can afford to conduct them every year. In Lebanon the latest such survey was carried out between September 2011 and October 2012 and preliminary results were available in April 2013.The previous survey referred to 2004.This year (2004) also saw a Census of Buildings, Dwellings and Establishments which provided a useful count of establishments by kind of activity.

Another important source is an Economic Survey of enterprises. CAS conducted such surveys for each year between 2004 and 2008.These surveys are difficult to conduct and to analyse, and the effective samples were relatively small. This can make the surveys unreliable as a source of aggregate data for the levels. But they are important for establishing key ratios for use in the estimation system, such as

- input output ratios
- for the trade sector, margins to turnover ratios

More recently, similar data available in the Ministry of Finance from the business income tax system was explored. Although it is likely that incomes are often understated, this source has

the merit of covering a large proportion of businesses. On the other hand, the tax return does not provide all the details necessary for national accounting purposes. Also taxpayers sometimes fail to allocate their incomes and expenditures to the appropriate categories. While this failure may not affect their tax liability, it affects reliability of the detailed information.

C   The benchmark

Establishing a "benchmark" level for a particular year is a necessary first step in producing annual estimates of GDP and its components. The benchmark is done by compiling a Supply-Use Table (SUT).In what follows, the words "demand" and "use" are synonymous.

Supply Use Tables

The standard SUT is described in Chapter 14 of the SNA (2008). In the standard view, on the next page, details of supply are shown in the top part of the table and those of demand (use) underneath. A simplified version, on the following page, shows a summary of supply and demand for each product group (commodity flow or goods and services accounts) and below this "the intermediate demand matrix" and value added by activity (the production accounts).These two tables are linked by the total output of, and the intermediate demand for, products.

Looking horizontally from left to right, the commodity flow accounts consist of columns showing the main categories of supply and demand, classified by product group (in rows).These main categories are, on the supply side
* Imports
* Total output
* Margins
* Taxes (less subsidies) on products

and on the use side
* Intermediate demand
* Final consumption
* Gross capital formation
* Exports

The production accounts are arranged vertically, showing output, intermediate consumption (by product group) and hence value added (in rows), classified by activity (in columns). The Lebanese classification of Products by Activity (LPA) constructed for this purpose consists of 140 detailed product groups arranged within 30 activities, based on ISIC Rev.4.

Compiling a benchmark SUT involves the following steps:
* setting up a Lebanese classification of Products and Activities (LPA)
* building bridge tables between the classifications in the source data and the LPA
* preparing the IT system for compiling the SUT
* assembling the data
* filling the SUT with data as far as possible
* balancing the SUT

Supply Use Table - general view

		Supply					Total supply at market prices
	Imports of goods & services	Production			Totals	Margins	Taxes on products less subsidies	
		Total output at basic prices						
		Activities						
Products								
Totals								

	Total uses at market prices	Use				
		Cost of production		Totals	Final consumption	Gross capital formation	Exports of goods & services
		Intermediate consumption					
		Activities					
Products							
Totals							
Gross value added	Income components						
	Total GVA						
Total ouput at basic prices							

Goods & services accounts from the supply use table

Supply				Total supply at market prices		Total uses at market prices	Uses			
Imports of goods & services	Total output at basic prices	Margins	Taxes on products less subsidies				Intermediate consumption	Final consumption	Gross capital formation	Exports of goods & services
					Products					
					Totals					

Summary production accounts from the supply use table

		Production accounts	
		Activities	Totals
Intermediate consumption	Products		
	Total IC		
Gross value added	Income components		
	Total GVA		
Total ouput at basic prices			

The last step (balancing) normally requires two or three iterations. It is a key exercise for establishing the best estimate of the level of GDP and its main components, within a consistent framework which incorporates all available information.

Populating the SUT in practice

The main data sources and procedures for populating the SUT were as follows (in order of complexity, and using the simplified paradigm above in which one or more columns are available for each dataset):

a. First, Customs data on the **imports** and **exports** of goods were converted from the Customs (Harmonised System) codes into LPA categories and entered into the appropriate columns, and similarly for balance of payments estimates for trade in services. Balance of payments data were adjusted to deduct the CIF/FOB adjustment from the import of transport (and insurance) services. The figures for travel credits and debits are entered in a special row. Travel debits do not need to be classified by product. Travel credits (expenditure by non-residents visiting Lebanon), initially a single figure, have to be allocated between the products purchased in a special column. In the absence of a survey of departing visitors, the allocation was provisional and subject to adjustment at the balancing stage.

b. Next, Household Budget Survey data was entered as **final consumption expenditure**, together with the estimates of government final expenditure (on public administration services, education and health).An allowance was also added for the consumption of Palestinian refugees and also (in 2011) for that of refugees from the Syrian conflict.

c. While some initial estimates, based on imports of machinery and equipment, were entered, **capital formation** was mostly estimated at the balancing stage.

d. Turning to total **output**, in the simplified format of the SUT it is assumed that businesses classified to a given activity produce only the characteristic products of the activity. The following sub-categories were used:
    o Output by VAT-registered businesses
    o Output by non-VAT businesses
    o Other specialised sources
    o Non-market output
Box 1 explains the approach in each case.

e. For each type of wholesaler and retailer, data on the overall **margins** included in the turnover of the traders were available from the Enterprise Survey. However in the SUT framework these have to be allocated to products. There were two possible approaches:
    o First, the margin percentages of each kind of trader can be allocated to the corresponding types of goods sold, separately for wholesalers and retailers. Both the retail and wholesale percentages would then be applied to the estimates of final consumption, while the wholesale margins alone would be applied to the other demand categories. Reconciliation with total estimated margins would be required during the balancing stages.
    o Alternatively, the margins earned by each type of trader can be spread between the products sold using the total supply of such goods as a guide.
The results of the two methods were compared and adjustments made accordingly.

> **Box 1: Measuring output**
>
> For **VAT businesses**, turnover as recorded in their VAT returns was taken as output of the products typical of that activity. For those engaged in wholesale or retail trade, however, their output (gross margin) was calculated from VAT turnover by applying margin ratios from the enterprise survey.
>
> For **non-VAT businesses**, the approximate number was established by subtracting the number VAT-registered businesses from the total number of establishments recorded in the 2004 Census of Buildings and Establishments. When multiplied by average output from the 2004 Enterprise Survey, this figure gave an initial estimate of non-VAT output. In the 2011 SUT, an extrapolated estimate of the 2004 estimates was used as the starting point.
>
> For **crops and for livestock**, for 2004 production data from the Ministry of Agriculture was used, while for 2011 similar data from CREAL was used. For **banks** aggregated profit and loss accounts were provided by the Central Bank and for **insurance** by the Ministry of Economy.
>
> Finally**, non-market output** was derived from the government accounts and included estimates of the consumption of own-account production, in particular the imputed rental value of owner-occupied dwellings.

f. **Taxes** on imported goods, including VAT collected on them by Customs, are available along with the CIF value of the goods. Taxes (including VAT) and subsidies on locally produced goods and services were also included. Details of the allocation of VAT to products are described in more detail in Annex 1.

g. The final category to be considered was **intermediate demand**. For most activities, average **input-output ratios** were obtained from an analysis of the Enterprise Surveys. Overall inputs by each activity were thus obtained by applying these ratios to the total output figures, (as adjusted subsequently in the balancing process).Each of the totals of intermediate demand had to be allocated to LPA products. The Enterprise Surveys provided partial information for this purpose, so provisional allocations were made and adjusted during the balancing process.

Balancing the SUT

The SUT framework requires that (a) for each product category, supply equals demand (use), and at the same time (b) intermediate demand for products equals the expected intermediate consumption by activity given the total output and the input-output ratios. Achieving a balance requires adjustments both (a) to the main supply and/or use categories (135 rows by 8 columns) and (b) to the intermediate consumption matrix (135 rows by 30 columns).

There are two kinds of adjustments in balancing a SUT. First, those made to imports, exports, and other final demand categories in order to balance the row, affect GDP and its components but do not have any indirect effects. Secondly, adjustments to output usually have consequential effects on the estimated intermediate demand for other products because they are linked by the input-output ratios. Also, if an adjustment to intermediate demand is made to achieve a balance in one row, this may imply changes to intermediate consumption in other rows. These second kind of adjustments do not affect GDP directly, but can affect the distribution of GDP between activities.

It was evident from a number of LPA rows that the data from the Household Budget Survey understated the expenditure of households to a significant extent .This is typically because important expenditures of certain types or by the wealthiest households tend not to be fully captured. It was therefore decided to make a global adjustment to household expenditure by giving significant additional weight to households in the top quintile (20 per cent) of total spending recorded.

On the other hand, it was also evident within the SUT framework that the balance of payments (BOP) estimates of expenditure by non-residents visiting Lebanon were far in excess of supply of goods and services typically purchased by the visitors, for example on accommodation and food in hotels and restaurants. An adjustment was therefore made to reduce both this figure and the figure for residents' spending abroad. In 2011, adjustments were also made to other categories of trade in services data from the BOP, as for example the value of credits far exceeded the corresponding value of output in Lebanon and the value of debits also exceeded the likely value of demand for such services by Lebanese businesses.

Following these global amendments, adjustments had to be made to each row on a case by case basis. The general principle was to increase rather than to decrease the existing figures in order to obtain a balance which is largely a matter of judgment. Thus allowance was included for unrecorded (informal) activity. Initially a near balance between the main components of supply and demand was obtained for each product, with total intermediate demand not too different from the total obtained via the production accounts. Then attention turned to balancing the intermediate demand matrix. This was an iterative process. Eliminating discrepancies in the rows of the matrix leads to discrepancies in the columns and vice versa. Plausible adjustments were made until a near balance was achieved, including some changes to the input-output ratios. The remaining differences were eliminated by an automatic raking process (RAS).

D   Annual estimates of GDP

The overall approach

The benchmark estimate of GDP derived from the SUT is effectively a combination of the "expenditure" and the "production" approaches to its measurement. In principle, it would also include the "income" approach, making use of direct estimates of the earnings of employees; company profits and the "mixed" incomes of the self-employed. But such data were not readily available.

The most direct method of estimating GDP on an annual (and also quarterly) basis is to extrapolate the benchmark using the production approach. This is done both at current and at constant prices. At constant prices, this is essentially equivalent to compiling an "index of production" for all activities in the economy. The procedures for doing this are described in this section. (See Annex 1 for a discussion of fixed base and chain-linked methods for compiling estimates at constant prices.)In what follows the words "quantity" and "volume" are used synonymously.

Value and quantity indices

As a result of the SUT, estimates for total output at basic prices are available for every kind of activity in the benchmark year. In most cases, estimates for each subsequent period are made by extrapolating the benchmark estimates using two types of indicators. These indicators are in the form of **value indices** (for current price estimates) and **quantity indices** (for constant price estimates).Usually, in order to calculate one or other of these indices, an appropriate **price index** is needed.

There are two main ways of estimating the value indices, and three main ways of compiling quantity indices, as follows.

Value indices (for current prices)

1. If estimates of the turnover of all the producers involved in a given activity are available directly, these can be used as an estimate of total output at current prices, or converted into an index to extrapolate the benchmark[1]. For many activities, the turnover data are readily available quarterly from the VAT system (for registered businesses) and also from the accounts of government and the banks. An allowance has to be made for businesses not registered for VAT for whom data are not so readily available (see below for details).

2. Alternatively, if turnover estimates are not available directly, a value index can be obtained by multiplying a quantity index by an appropriate price index.

Quantity indices (for constant prices)

1. If a value index is available directly (case 1 above), a quantity index can be derived by dividing the value index by an appropriate price index. (The SNA recommends this method should be used wherever possible.)

2. If estimates of quantities produced are available (e.g. for agricultural products), they can be converted into index numbers using a fixed set of prices. There is a danger with this method: if new products are not included, a downward bias can result.

3. If neither values nor reliable quantities are available, proxy indicators of quantity may have to be used. For example, to estimate the overall output of the construction industry, an indicator based on the quantities of cement available may be used. Occasionally, in the absence of anything better, the quantity indicators may have to be based on the estimated growth rate of the population.

Appropriate price indices

Ideally the price indices used in these calculations will reflect the change in the basic price (i.e. the "factory gate" price, excluding VAT, excise duties and similar taxes on products, but including subsidies) of the particular goods or services in question. The most readily available indices are the components of the Consumer Price Index (CPI).Though not ideal, these indices can be adjusted if necessary to reflect changes in tax rates and in margins (less obvious) in the absence of a series of producer price indices. For agricultural products, data on prices (and hence the value of production) are available. For some products information on the price of exports may provide a guide.

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[1]In principle, for activities where finished goods are stocked or work is in progress, an adjustment should be needed for such changes in the inventories, but reliable information on inventories is not usually easily available and the effect on GDP is small.

Output indicators

As described above, the main requirement when estimating GDP is to measure the output of each activity. The main source of data for this purpose was the VAT system.

VAT data

Registered VAT traders make returns every quarter to the Ministry of Finance showing their sales (both taxable and non-taxable) and purchases, together with the corresponding "output" tax collected from customers and "input" tax already paid to suppliers or on importation. Based on the detailed coding of activities by the Ministry, quarterly estimates of turnover were compiled for 30 major activity categories.

However, since its inception in 2002, the coverage of the VAT system has increased greatly. Trends in the total turnover of VAT traders in a given activity will therefore tend to overstate the increase in turnover of all businesses in the activity. To overcome this problem a method was devised to produce indicators that compensate for the increasing coverage. This is described in Annex 1.

For many of the major activity categories the adjusted indicators were used directly as indicators of output at current prices. Indicators of quantity were obtained by dividing by a suitable price index, usually a combination of components of the consumer price index (CPI).

Other output indicators

For some sectors, where the VAT information is not appropriate, other sources of data were used, as in the SUT compilation. For example, statistics and accounting information provided by Middle East Airlines were used for calculating the output of the local air transport industry.

The main indicator of construction activity is the deliveries of cement. Building permits were not used as a source, as there is no indication of if and when the buildings were actually constructed. There is no direct information on the total value of construction work, most of which is informal.

When it came to estimating the output of wholesale and retail trade activity (margins on traded goods) at constant prices, the mark-ups were assumed to be constant. There are at least three ways in which the estimates can be made, but the approach adopted was to extrapolate the benchmark margins using the adjusted VAT indices, deflated by appropriate combinations of the detailed CPI components.

The same applied to the EdL. Total output of general government was calculated from the government sector accounts (see Section F) and split between Public Administration, Education and Health.

A summary of the methods used for each activity is given in Annex 2.

Estimating gross value added

The most important estimates to be made annually (or quarterly) are those of total output by activity, especially at constant prices. The next step in estimating GDP involves calculating gross value added (GVA) defined as the difference between total output and intermediate consumption. Finally taxes on products (including VAT) are added and subsidies subtracted.

GVA by activity at constant prices

Given the estimates of total output for a particular activity, gross value added (GVA) at constant prices can be estimated on the assumption that the average input-output ratio for each activity does not change over time at constant prices. In other words, if the *quantity* of output increases by 10 per cent (say) then the assumption is that the *quantity* of inputs required to produce the output will also have increased by 10 per cent. In most situations this is a reasonable assumption in the short term. For example, the output of a lorry depends on the distance it travels. The further it travels the more fuel it will require. Of course, if a more fuel-efficient lorry replaces the old one, this assumption will break down. Attempting to improve on the assumption by trying to measure the actual intermediate consumption at constant prices directly (known as double deflation), while theoretically correct, would require a very much more sophisticated body of data and analytical resources, which is beyond the scope of most countries. It is more important to focus on the *sine qua non*: good quality assessments of total output. The assumption of fixed input-output ratios implies that, at constant prices, the same quantity indicator of total output can be used for extrapolating gross value added (and intermediate consumption).

GVA by activity at current prices

Where detailed annual accounts of producers are available, direct estimates of GVA at current prices can be made. This is the case for the financial sector, the general government, sector and some public enterprises.

Potentially, the most comprehensive source of such data for the private sector is held by the Ministry of Finance based on business income tax returns. However, the tax data may take more than a year to become available. In fact, only data in relation to the year 2010 were available to CAS at the time the 2011 (and previous years' figures) were compiled. Initial analysis indicated that this source may not provide data of sufficient quality for regular use. However, further investigation may in future reveal ways to make use of this important resource.

In the meantime, an alternative extrapolation method was used for most activities, where direct information was not available. The starting point was the assumption (described above) that the input-output ratios are fixed at constant prices from one year to the next. First, price changes of the total supply (imports and local production) of each product were calculated. These price changes were weighted by the structure of intermediate consumption of each activity, in order to determine the overall price changes of the intermediate consumption of each activity. These price changes were applied to the intermediate consumption at constant prices to obtain the current price equivalent.GVA at current prices was then found by subtraction. This process would ideally be described as "deflation-inflation", as output is generally deflated but inputs inflated.

It may be noted that this approach can lead to volatile deflators at the level of activities. This is a natural consequence of the methodology, reflecting different price changes between inputs and outputs which may either squeeze profits or generate extra income in the short term. Although the precision of the estimates may be weak at this level, as they are aggregated statistical theory dictates that the precision improves, so we can be reasonably confident of the estimates of overall GVA.

Taxes and subsidies on products

To go from Gross Value Added (GVA) at basic prices to Gross Domestic Product (GDP) at market prices, taxes on products have to be added and subsidies on products subtracted.

In the national accounts, taxes on products are those taxes that directly affect the price of the products paid by purchasers. In Lebanon these include

- (Non-refundable) Value Added Tax (VAT)
- Import duties
- Excise duties on petroleum products, tobacco and motor cars
- Taxes included in the price of air tickets.

In addition, some public sector enterprises are considered to be fiscal monopolies (SNA2008 para 7.96) and their profits treated as a tax on products. In Lebanon, this applies to the telecommunications industry, which is operated exclusively by enterprises owned by the government.

At constant prices, fixed tax rates are applied to appropriate volume indicators.

Equally, persistent losses of such bodies (financed by the government) are treated as subsidies (SNA2008 para 7.105).This applies to Electricité du Liban, which since 2004 has effectively been subsidised. This major subsidy is the only one that has been treated as a subsidy on a product. Further details are given in Annex 1.

E   Expenditure components of the GDP

Unless high quality data on household consumption is available every year, reliable independent estimates of GDP cannot be produced using the expenditure approach.

However, the supply-use framework can be used to estimate the final consumption expenditure of households using the commodity flow approach (goods and services accounts).The framework may also be used to validate or modify the estimates made using the production approach.(These goods and services accounts were the main basis of the *Economic Accounts of Lebanon* in which estimates of imported inputs were used as indicators of output.)

The expenditure components of GDP are

- Final consumption expenditure of households, non-profit institutions and government
- Gross fixed capital formation, changes in inventories and the acquisition less disposal of valuables
- Exports *less* imports of goods and services

Overall estimates of these components were derived as follows (in reverse order):

Exports and imports

For periods since 2008, a new monthly Foreign Trade Statistics system was established in CAS with the aim of providing statistics of trade (according to the LPA classification and main use) together with volume and price indices. The estimates for the import and export of goods are based on this system.(For earlier years the annual data series were used.)

For services, the intention was to use the Balance of Payments data provided by the Banque du Liban (BdL).The overall CIF value of imports were converted to FOB using the same ratio (7%) used by the BdL. The BdL estimated trends in travel credits and debits were also used, although the level of these estimates was substantially reduced in line with the adjustments

used in the benchmark SUT. Unfortunately, changes made to the methodology used by BdL since 2009 rendered their trade in services data unusable in the context of the national accounts time series, so an alternative method was needed to extrapolate the benchmark. For the export of each service, the indicator of the output of the service was used as a proxy, while for debits a global indicator of the intermediate consumption of Lebanese producers was used as a proxy. The whole area of trade in services ("invisible trade") needs improvement, and this will only be possible through a programme of targeted surveys to be conducted by CAS in the future when the necessary resources would be available.

Capital formation

For **gross fixed capital formation** (GFCF), the benchmark estimates are extrapolated at current and constant prices using estimates of the output of the construction industry together with data on the imports of capital goods.

There are no data regularly available on **changes in inventories** (the value of the physical increase).If estimates were made, they would have to be based on judgments about the likely changes, in relation to other components. However, a category for the **acquisition less the disposal of valuables** (in the case on Lebanon, gold ingots) was included.

Final consumption

The figures for general government final consumption expenditure come from the accounts of the sector. In the absence of information (except in 2004 and for 2011-2012) the estimates of household final consumption are then obtained as a residual by subtracting the other components from the estimates of GDP. Thus this component is the least reliable as it contains all the errors and omissions in the estimates of GDP and the other expenditure components (for example, but not only, changes in inventories).

F   Sector accounts

Compiling full accounts for each institutional sector (non-financial companies, the financial sector, general government and households) depends mainly on the availability of two kinds of data:
- that found in profit and loss (or income and expenditure) accounts, flow of funds and balance sheets for sectors other than households
- specifically transactions with the rest of the world (balance of payments data)

The methods then amount to allocating the various transactions shown in these accounts to the corresponding national accounting (SNA) transaction category. In some cases assumptions may have to be made in order to allocate an item between more than one of the categories.

Largely based on the existing economic accounts methodology, a system for producing accounts was developed for the following sectors:
- Financial sector (in particular, the banks)
- General government

In the **financial sector**, a key element was missing – the transactions of the Central Bank. The data for all other banks was complete up to 2011.Full accounts were produced for all years since 2004.The insurance sector data was also available up to 2011.The production

account was developed but not the other accounts so the accounts of the insurance sector won't be published. The accounts of the banks (S122) are published.

The **government sector** consists of the following subsectors:
- Central government: Budget and Treasury transactions (mainly from the *Public Finance Annual Review* of the Ministry of Finance)
- Central government(extra budgetary accounts):
  - CDR (2007, 2010 and 2011 accounts were missing but key variables estimated)
  - Other autonomous bodies (includes only limited estimates based on transfers from the Budget).
- Municipalities (based on data up to 2008, estimated for 2009-2011)
- Compulsory Social Security
  - NSSF accounts)
  - Civil servants' cooperative

A prototype system was also developed for the following sectors:

- Rest of the world sector
- Non-bank private sector

The **rest of the world sector** was a reworking of the balance of payments data (from the Banque du Liban) converted from US dollars into Lebanese pounds. In an effort to complete the picture, estimates were also made (by residual) for what should be the "**non-bank private sector**", making use of the overall estimates of GDP and its components (the **goods and services account)** and the above sector accounts. However, these accounts were not considered sufficiently robust to publish because of the adjustments that had to be made to the balance of payments estimates and the need to include figures for both the Central Bank and other Public Enterprises.

With currently available data (and for the foreseeable future) it is not possible to compile meaningful accounts for the non-financial corporate sector, for households and for non-profit institutions separately. Even if the data could be obtained, it is doubtful whether the benefits of attempting to compile such accounts in Lebanon would exceed the costs.

Annex 1

Technical issues

The following specific issues affect the compilation procedures and the results. They are discussed in more detail below:

- Constant prices: a fixed base or chain linked?
- Correcting for increasing coverage of the VAT system.
- Allocation of VAT to products
- Revenue from telecommunications
- Electricity subsidies
- Electricity bought by households from private suppliers
- Calculating FISIM (Financial intermediation services indirectly measured)

Constant prices: a fixed base or chain-linked?

Aggregate estimates at constant prices may be calculated in one of two ways, which give slightly different results:

- the prices of a fixed base year, moved forward every five years or so, whenever a new "benchmark" can be prepared; or
- the prices of the previous year, chained to show a continuous series.

Using previous year prices (PYP) avoids those revisions that come from changing the base year less frequently. Changes in relative prices are thus accounted for on a continuous basis. However this method has the disadvantage that a series of annual figures at PYP is meaningless. To overcome this problem it is usual to rescale (or chain-link) the figures to provide continuous series equal to the current price figures in a specific reference base-year. Unfortunately, when this is done, the constant price figures only add up in two years: the reference year and the year after it.

In common with countries of the European Union, the former *Economic Accounts of Lebanon* (EAL) used the PYP approach (chained series were not however provided). It was decided to retain the PYP method in calculating aggregate GDP at constant prices and to present the results as chain-linked series. The choice of reference year does not affect the growth rates of a chain-linked series and is therefore an arbitrary one. Often a benchmark year is chosen or the beginning of a decade. The year 2010 was chosen on this occasion, it being the last year for which the former system of estimation was used.

Correcting for the increasing coverage of the VAT system

The following solution was adopted to compensate for the increasing coverage of the VAT system. Each quarter, separate data for VAT traders making returns for the first time was obtained, together with information on the year in which the businesses were actually first registered (sometimes several years before they joined the VAT system).The increase in VAT turnover each quarter was then adjusted to exclude the turnovers of new VAT traders if they had existed before the current or the previous year. The resulting reduced changes were then cumulated in index form to provide an indicator of the overall output for each activity. These indicators were applied to the benchmark estimate which included estimates for non-VAT activity.(Based on these assumptions, a rough idea of the output of businesses outside the VAT system may then be obtained by subtraction.)

Allocation of VAT to products

The allocation of VAT to products in the Supply Use Table (SUT) is not straightforward. "Output VAT" (the tax charged to customers) is available by kind of activity and converted to LPA products. However, the calculation is complicated by the need to consider wholesale and retail trade as a special case, as only the output VAT on the margins is to be included in the SUT. "Input VAT" is available in total classified by the economic activity of the purchaser. The intermediate demand matrix is used to allocate the input VAT to products. Again a special procedure is required for commercial trade. Finally, adjustments are made to ensure the net VAT applicable to a product is not negative.

Revenue from Telecommunications

The profits received by the government from the telecommunications industry is treated as "non-tax" revenue in the reports of the Ministry of Finance. However, as the industry is operated entirely by publicly owned enterprises and as prices are set at a level far above the costs of production, the SNA requires the revenues to be treated as a tax on the product. The output of the industry at basic prices therefore excludes the profits transferred to government and so is relatively small in comparison to the total turnover.

A proportion of the profits, including the net VAT collected on sales, are earmarked for municipalities. Some of these funds were not transferred to the Ministry of Finance but held in the Banque du Liban. CAS does not have the full information necessary, but a rough estimate has been included to account for these flows.

Electricity subsidy

According to the SNA, public enterprises that operate at a loss (funded by transfers from central government) because the selling price does not reflect the costs of production should be considered as receiving a subsidy on the product. This is the case with electricity supplied by Electricité du Liban (EdL). The method of computing the subsidy is as follows.

The value of transfers made to EdLis published by the Ministry of Finance. These are taken as the indicating the general level of the subsidy at current prices, but the figures are adjusted to an accruals basis by relating the value to the annual costs of production, together with an allowance to cover financing costs, bad debts, etc.

Calculating the cost of production from data on purchases involves some assumptions. The precise quantity of fuel used in the production of electricity each year is uncertain, so it is calculated by multiplying the quantity of electricity produced by a (fixed) technical ratio. The ratio is derived from the available data on fuel consumed. So are the prices, which are used to calculate the cost of the fuel inputs. The cost of other inputs is added, including the cost of electricity purchased from other producers or imported.

The total of these costs and the allowance for financing is the value of total supply at basic prices. The subsidy is the difference between this value and the invoiced sales. The subsidies thus calculated differ somewhat from the transfers made to EdL by the government to pay for the fuel.

At constant prices the estimates are based on the quantities of sales, production and of inputs, multiplied by corresponding base year prices. The value of the subsidy at constant prices is measured using the total quantity of supply as the indicator. The value added of EdL at constant basic prices is measured by subtraction (double deflation).

The methods described above make the best use of the data available for national accounts purposes. More complete data from annual balance sheet and profit and loss accounts of EdL would allow more precise estimates.

VAT on electricity

According to the VAT data, EdL charges VAT on its sales, but the amount is much less than the amount already paid by EdL on inputs (mainly fuel).This implies a substantial refund of VAT is due to EdL.It is not clear whether this is in fact repaid and how it is accounted for.

Electricity bought by households from private suppliers

From time to time (on a total of six occasions) since December 2007, CAS conducted a survey of around 1,000 households for the purpose of measuring the price of rents and related items for the CPI. One of the items covered was the cost of electricity supplied by private producers when the EDL supply is not available. The latest survey took place in April/May 2012.The results were included in the July 2012 CPI. The data was analysed for use in the national accounts.

Financial Intermediation Services Indirectly Measured (FISIM)

This section explains how Financial Intermediation Services Indirectly Measured is calculated in the national accounts of Lebanon and how it is allocated as an imputed expense of depositors and of borrowers.

In the Lebanese national accounts, FISIM in total is measured as the difference between interest received by banks from borrowers and interest paid to depositors. In line with previous international recommendations, this method is the one used in the former *Economic Accounts of Lebanon*. A method based on current international recommendations, set out in the 2008 edition of the UN *System of National Accounts 2008* (SNA), was considered but rejected (see below).

Half of total FISIM is allocated to borrowers and half to depositors. This method differs from the one used in the former LEA, in which the cost of FISIM was allocated entirely to borrowers, including to Government in respect of Treasury bills held by banks. The new method is more in line with the current SNA approach. It excludes Treasury bills from consideration because in principle they can be held by anybody.

The distribution of FISIM between sectors and activities is based on the distribution of loans outstanding and on assumptions about the characteristics of depositors.

Divergence from the latest international standards

In the SNA 2008, a more sophisticated method is set out. It will not be described here, except to say that it involves applying a "reference interest rate" to loan assets and deposit liabilities. An attempt was made to implement this method, but the results were not satisfactory. In Lebanon, Treasury bills and bonds represent a very substantial proportion of the assets of the commercial banks. When these are excluded, the loan assets are relatively small compared with deposit liabilities. Current inter-bank rates generally differ from current or average Treasury bill rates. The available data did not allow a reference rate to be calculated with any confidence.

Although the new international standards are theoretically appealing, in practice there are complications that lead to anomalies and they remain under review. The best solution was

therefore to retain the historical method. An important practical advantage of this method in a small country like Lebanon lies in its simplicity, avoiding the need for detailed data and calculations of uncertain accuracy.

Annex 2

Summary of output indicators

Activity	Code	Values (CP)	Quantity (KP)	Prices
Agriculture & forestry	A1	Ministry of Agriculture& CREAL	Ministry of Agriculture& CREAL	V/Q
Livestock & livestock products; fishing	A2	Ministry of Agriculture& CREAL	Ministry of Agriculture& CREAL	V/Q
Mining & quarrying	B	P*Q	Cement available	Construction prices
Manufactured food products	C1	VAT sales adjusted	V/P	CPI components
Beverages	C2a	VAT sales adjusted	V/P	CPI components
Tobacco	C2b	Regie de Tabac accounts	V/P	CPI component
Textiles& clothing	C3	VAT sales adjusted	V/P	CPI components
Wood, paper & printing	C4	VAT sales adjusted	V/P	CPI components
Chemicals, rubber & plastics	C5	VAT sales adjusted	V/P	CPI components
Non-metallic mineral products	C6	VAT sales adjusted	V/P	CPI components
Metal products, machinery & equipment	C7	VAT sales adjusted	V/P	CPI components
Furniture & other manufactures	C8	VAT sales adjusted	V/P	CPI components
Electricity (public)	Da	EdL data	EdL data	V/Q
Electricity (private)	Db	P*Q	Rent survey for CPI	V/Q
Water supply& waste management	E	VAT sales adjusted	V/P	CPI component
Construction	F	P*Q	Cement availability & imports of construction materials	Construction prices from Infopro website Import prices
Commercial trade	G1a	VAT sales adjusted for each trade category	V/P	CPI components
Triangular trade	G1b	P*Q	Port statistics on trans-shipments	Commercial trade deflator
Vehicle maintenance and repair	G2	P*Q	No. of vehicles	CPI components
Road transport	H1	P*Q	No. of taxis, buses, lorries	CPI components
Air transport	H2	MEA accounts	MEA pax- & freight-kms;	V/Q

Activity	Code	Values (CP)	Quantity (KP)	Prices
Other transport	H3	VAT sales adjusted	V/P	CPI components
Hotels & restaurants	I	VAT sales adjusted	V/P	CPI components
Publishing	J1	VAT sales adjusted	V/P	CPI components
Telecommunications	J2	VAT sales adjusted & additional estimates	V/P	CPI components
IT services	J3	VAT sales adjusted	V/P	CPI components
Financial services	K	BdL for banks MoE for insurance	V/P	CPI all items
Real estate	L	P*Q	Assumed change in no. of households	CPI components
Professional services	M	VAT sales adjusted	V/P	CPI components
Administrative services	N	VAT sales adjusted	V/P	CPI components
Public administration & international	O	Govt accounts, CDR, NSSF, Municipalities	V/P	CPI all items & estimated wage increases
Education – public	P1	Govt accounts	Number of students by level	V/Q
Education – private	P2	P*Q	Number of students by level	CPI components
Health – public	Q1	Govt accounts	V/P	CPI components
Health – private	Q2	VAT sales adjusted	V/P	CPI components
Personal services	R,S,T	VAT sales adjusted P*Q	V/P No of foreign domestic workers	CPI components

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