Macroeconomic and Statistical Analysis

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Outline

- Macroeconomic Analysis and Accounts
- Select building blocks of Macroeconomic Statistics
    - System of National Accounts (SNA)
    - Coincident and Leading Indicators
    - Consumer Price Index

I- Macroeconomic Analysis (1)

- Macroeconomics is concerned with how the overall economy works.

- It broadly focuses on explaining the movements of :
  - National output measured by the Gross Domestic Product ,
  - Unemployment and
  - Inflation.

I- Macroeconomic Analysis (2)

- It guides policymakers in their pursuit of economic objectives and policy formulation.

- Both the analysis of events and design of policies require accurate economic information and statistics that are made available in a systemic and timely fashion.

I- Four types of macroeconomic accounts

1. National Accounts → Real Economic Activity
2. Fiscal Accounts → Public Sector / Government Activity
3. Balance of Payments accounts → Rest of the World Activity
4. Monetary Accounts → Banking sector Activity

II- Select building blocks of Macroeconomic Statistics

A. System of National accounts
   - Methodology
   - Time Series

B. BDL Coincident and Leading Indicators
   - Purpose and Usefulness
   - Nature and frequency
   - Methodology
   - Time Series
   - Consistency
   - Usage by the IMF

C. Consumer Price Index
   - Methodology
   - Time Series

A-System of National Accounts

- The System of National Accounts (SNA) is the internationally agreed standard set of recommendations on how to compile measures of economic activity.

- The SNA describes a coherent, consistent and integrated set of macroeconomic accounts in the context of a set of internationally agreed concepts, definitions, classifications and accounting rules.

A- System of National Accounts

- The SNA provides an overview of economic processes, recording how production is distributed among consumers, businesses, government and foreign nations. It shows how income originating in production, modified by taxes and transfers, flows to these groups and how they allocate these flows to consumption, saving and investment.

A- SNA: Accounting Rules

The accounting rules and procedures used in the SNA are based on those long used in business accounting. The traditional double-entry bookkeeping principle, whereby a transaction gives rise to a pair of matching debit and credit entries within the accounts of each of the two parties to the transaction, is a basic axiom of economic or national accounting.

A- SNA: Accounting Rules

For example, recording the sale of output requires not only an entry in the production account of the seller but also an entry of equal value, often described as the counterpart, in the seller's financial account to record the cash, or short-term financial credit, received in exchange for the output sold.

As two matching entries are also needed for the buyer, the transaction must give rise to four simultaneous entries of equal value in a system of macroeconomic accounts covering both the seller and the buyer.

A- SNA: Sectoring

All resident institutional units are allocated to one and only one of the following five institutional sectors:

- The non-financial corporations sector;
- The financial corporations sector;
- The general government sector;
- The non-profit institutions serving households sector;
- The households sector

A-SNA : Classification

- National accounts include the following accounts for the economy as a whole and its main economic actors
  - Current accounts:
    - **Production accounts** = value of domestic output and the goods & services used up in producing that output = sum of value added = GDP
    - **Income accounts** = both the income generated in production (e.g. wages and salaries) and taxes and social benefit payments = disposable income = National Income
    - **Expenditure accounts** = disposable income (either consumed or saved) = saving

A- SNA : Classification

- Capital accounts: investment in non-financial assets and the funds that can be used to finance them = net lending/borrowing
- Financial accounts: "investment" in financial instruments, debts and forms of debts = net change in financial position
- Balance sheets: stock of assets, both financial and non-financial, and liabilities at a particular point in time

A-SNA : GDP Definition

- GDP is the most important aggregate derived from the production account.
- GDP measures the additional value of goods and services (VA) that are newly created in the economy and are available for domestic final uses or for exports. It reflects the aggregate production of a country, i.e. its economic growth.

A- SNA: The alternative approaches to measure GDP

According to the production and expenditure approaches:

$$GDP = \Sigma\ VA = C+I+G+(X-M)$$

C = Private & public consumption

I = Investment

G = Public expenditures

X-M = Exports - Imports = Trade balance

ΣVA = Sum of value added (Output - Intermediate consumption) of all the economic sectors

A- GDP Economic Sector Coverage

- GDP measures the production activity level in the following eight economic sectors:
  1. Agriculture and livestock
  2. Energy and water
  3. Industry
  4. Construction
  5. Transportation and communication
  6. Market services
  7. Trade
  8. Government

A- Nominal vs. Real GDP

- Nominal GDP → measures the value of the output of the economy at current prices.

- Real GDP → measures the value of the output of the economy using the prices of a fixed base year, referred to as constant prices.

A- GDP Time Series

	Nominal GDP (USD millions)	Real GDP growth rate
1997	14,865	-
1998	16,168	3.9%
1999	16,491	-0.8%
2000	16,679	1.1%
2001	17,065	3.9%
2002	18,712	3.4%
2003	20,083	1.7%
2004	21,790	7.5%
2005	21,861	0.7%
2006	22,190	1.4%
2007	24,958	8.4%
2008	29,684	8.6%
2009	34,650	9.0%
2010	37,124	7.0%

Source: IMF staff calculations

B- BDL Economic Indicators : The coincident and leading indicators

- Purpose and Usefulness
- Nature and frequency
- Methodology
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B- BDL Economic Indicators: Purpose and Usefulness

- The coincident indicator is a useful tool for conjunctural analysis and GDP estimation.
- The leading indicator is a useful tool for early prediction of economic slowdown or boom.
- Both indicators are a useful tool for policy makers in implementing appropriate economic policies (especially given the timeliness of National Accounts production in Lebanon).

B- Nature and frequency

- In Anglo-Saxon countries, three composite indicators are mostly used:
  - The Coincident Indicator that diagnosis current activity (monthly basis) and, accordingly, predicts the growth rate
  - The Leading Indicator that predicts future activity (quarterly basis)
  - The Lagging Indicator that traces previous activity
- In other countries, the business survey is used.

B- BDL Coincident Indicator Methodology

- The BDL Coincident Indicator is based on seven quantitative components which showed a strong positive correlation with GDP :
  1. Imports of petroleum derivatives
  2. Electricity production
  3. Cleared checks, deflated by the CPI
  4. Cement deliveries
  5. Number of passengers at the Beirut International Airport
  6. Foreign trade, deflated by the CPI
  7. Monetary aggregate M3, deflated by the CPI

B- BDL Coincident Indicator Methodology

- The correlation between each component and the GDP, was tested according to the following econometric relationship:

$$\text{Component} = a_i \, \text{GDP} + b_i$$

- The weight of each component in the Coincident Indicator is equal to the adjusted a_i factor, whereby $\Sigma \, a_i = 1$

B- BDL Coincident Indicator Time Series

Jan- Nov 2012

	Petroleum	EDL	Cheques	Cement	Foreign passengers	Foreign trade	M3	Coincident Indicator
Jan-12	169.9	167.8	207.4	188.1	429.7	185.1	523.9	**249.8**
Feb-12	178.3	168.0	215.8	218.7	436.3	226.8	531.2	**263.9**
Mar-12	178.6	168.1	216.4	236.8	439.4	204.1	532.1	**264.8**
Apr-12	181.9	166.8	213.0	243.2	529.1	191.1	528.3	**273.7**
May-12	181.5	164.9	209.8	248.6	453.2	190.6	527.6	**265.3**
Jun-12	177.6	161.8	219.6	202.9	450.0	211.3	538.0	**261.0**
Jul-12	181.4	158.2	217.4	188.8	375.4	190.1	538.8	**247.8**
Aug-12	185.5	154.5	202.6	118.8	332.6	193.9	536.1	**230.0**
Sep-12	186.7	151.4	194.4	182.2	375.7	201.0	526.3	**243.5**
Oct-12	186.8	149.2	190.2	206.6	472.7	185.0	528.1	**255.6**
Nov-12	181.1	148.9	206.0	216.7	499.7	183.3	527.6	**260.8**

Source: Statistics & Economic Research staff calculations

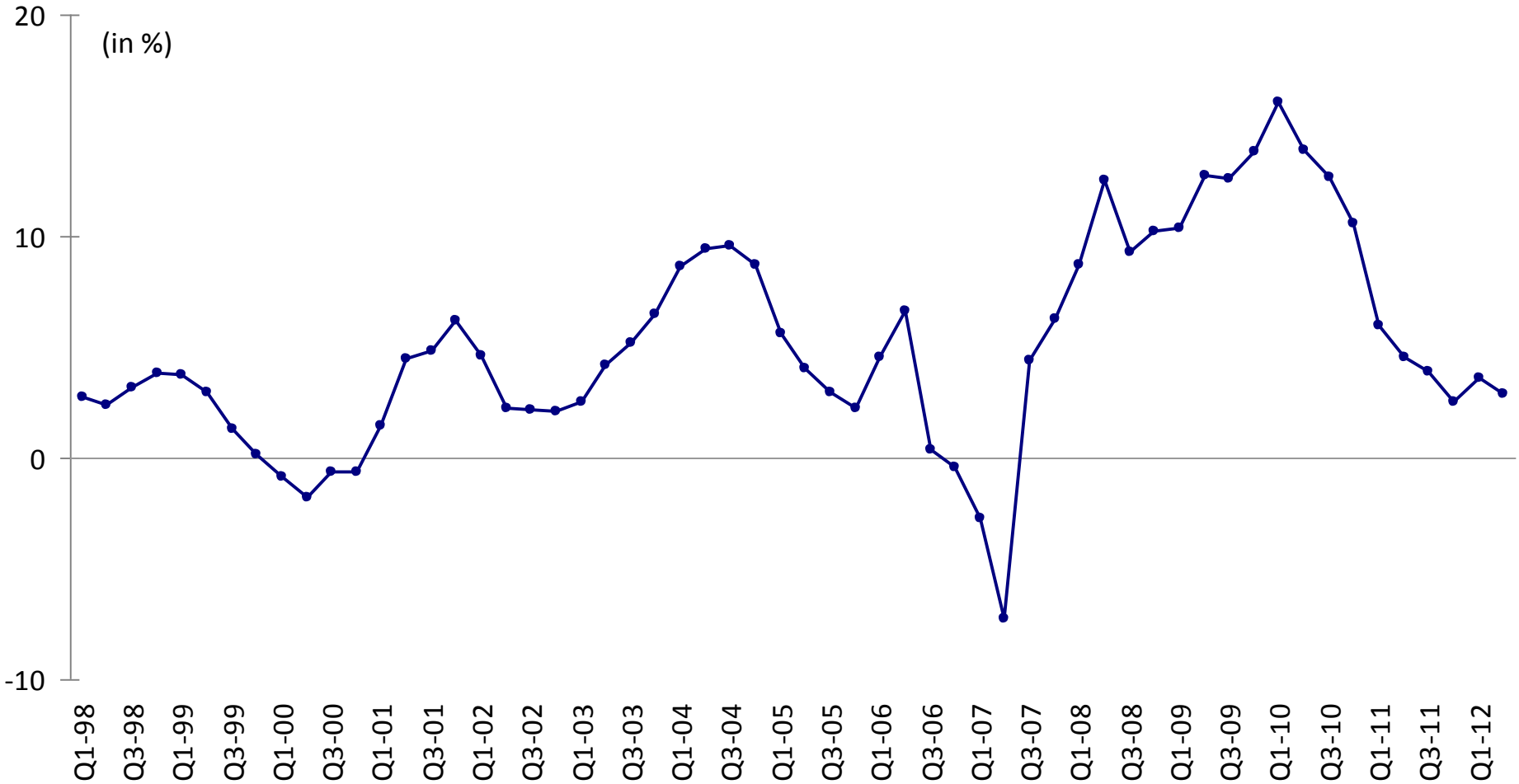
B- Consistency

- The BDL Coincident Indicator is strongly correlated with real GDP growth as shown by the national accounts. The relationship between these two variables is the following:

$$\text{GDP Growth} = 0.7 \times \text{BDL Coincident Indicator Growth}$$

- Over the past years, it has been proved that this equation gives an accurate estimate of GDP

B- BDL Coincident Indicator Growth

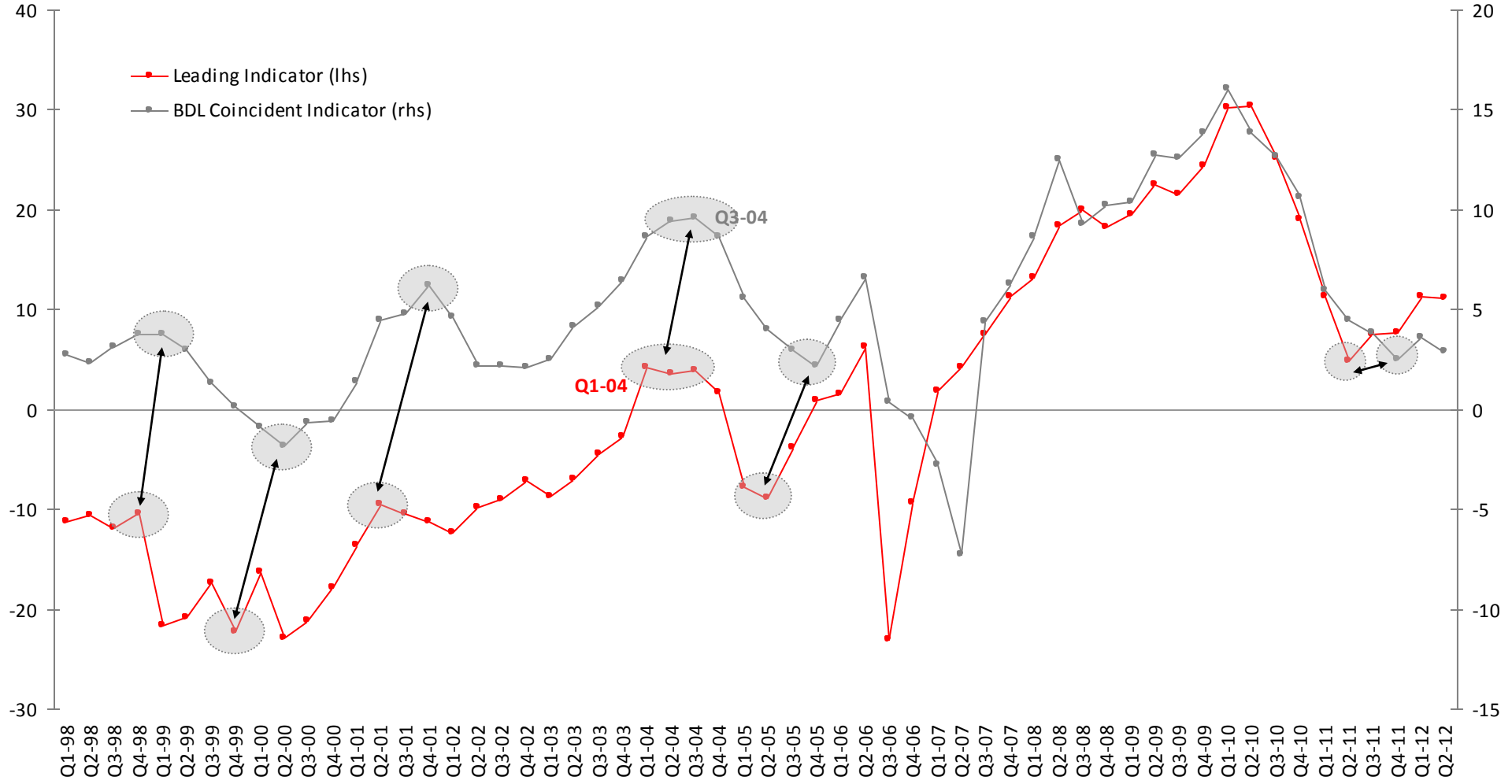


- 2007-mid 2010: Strong growth (between 7% and 8% annually)
- Mid 2010-2012: Downturn (yearly growth of 2%)

B- Leading Indicator Methodology

- The Leading Indicator is based on three business survey qualitative indicators, equally weighed:
  1. Registered orders in the Industrial sector
  2. Investment in the Industrial sector
  3. Portfolio of projects in the Construction & Public Works sector
- The Leading Indicator provides an early indication of changes in the BDL Coincident Indicator, and gives a preview of the GDP trend before the change occurs.

B- BDL Leading & Coincident Indicators



B- BDL Leading & Coincident Indicators

- The comparison between the two curves indicates that the Leading Indicator precedes the Coincident Indicator by one or two quarters:

	Leading	Coincident
Peaks:	Q4-98	Q1-99
	Q2-01	Q4-01
	Q1-04	Q3-04
Troughs:	Q4-09	Q2-00
	Q2-04	Q4-04
	Q1-05	Q3-05
	Q2-11	Q4-11

B- BDL coincident indicator & the IMF

- The International Monetary Fund (IMF) growth forecasts are mainly based on BDL indicators.
- Over the period 2007-2012, the coincident indicator trend goes along with the IMF statistics on economic growth.

C- Consumer Price Index

- Inflation measures : GDP Deflator vs. CPI
- Methodology
- Time Series

C- GDP Deflator

- Index that measures the average price level of an economy's output relative to a base year.
- GDP Deflator = $\left\{ \frac{\text{Nominal GDP}}{\text{Real GDP}} \right\} \times 100$
- Percentage change in GDP Deflator measures the rate of price increases of all goods and services in the economy.

C- Consumer Price Index

- The Consumer Price Index CPI* is an Index of the cost of a fixed market basket of goods and services, purchased by a typical household for consumption.

- The CPI basket is divided into 12 components, weighted according to the household's average expenditures and designed to measure the annual and monthly inflation

- Monthly inflation = $\left\{ \frac{CPI_m}{CPI_{m-1}} - 1 \right\} \times 100$

**Source: Central Administration of Statistics (CAS)*

C- CPI vs. GDP Deflator

Main Differences :

1/ Types of goods and services in the basket

2/ Fixed vs. Variable weights

3/ GDP Deflator : only domestic goods

C- Major CPI components and weights

Components	Weights
1. Housing water, Electricity, Gas & Other fuels	25.7%
2. Food & Non-alcoholic beverages	19.9%
3. Transportation	12.3%
4. Education	7.7%
5. Health	6.8%
6. Clothing & footwear	6.2%
7. Communication	4.8%
8. Furnishings, household equipment & routine household maintenance	3.9%
9. Recreation , Amusement & Culture	3.7%
10. Restaurant & Hotels	2.7%
11. Alcoholic beverages, tobacco	2.1%
12. Miscellaneous goods & services	4.2%

C- CPI Time Series

	CPI Index (CAS)	CPI annual growth (CAS)	CPI Index (adjusted by BDL)	CPI adjusted annual growth
Apr-10	110.1	4.7%	110.1	4.7%
May-10	110.0	4.9%	110.0	4.9%
Jun-10	109.1	3.4%	109.1	3.4%
Jul-10	109.3	2.9%	111.8	5.3%
Aug-10	110.1	3.4%	112.6	5.8%
Sep-10	111.0	4.0%	113.6	6.4%
Oct-10	113.0	4.8%	115.6	7.2%
Nov-10	113.5	4.3%	116.1	6.7%
Dec-10	114.1	4.6%	116.7	7.0%
Jan-11	114.4	6.0%	117.0	8.5%
Feb-11	114.7	5.8%	117.3	8.2%
Mar-11	114.9	4.9%	117.5	7.3%
Apr-11	115.9	5.3%	118.6	7.7%
May-11	116.2	5.6%	118.9	8.1%
Jun-11	115.7	6.0%	118.4	8.5%
Jul-11	115.6	5.8%	120.9	8.1%
Aug-11	116.2	5.5%	121.5	7.9%
Sep-11	116.3	4.8%	121.6	7.1%
Oct-11	117.0	3.5%	122.4	5.9%
Nov-11	117.6	3.6%	123.0	5.9%
Dec-11	117.6	3.1%	123.0	5.4%
Jan-12	117.7	2.9%	123.1	5.2%
Feb-12	118.6	3.4%	124.1	5.7%
Mar-12	119.4	3.9%	124.9	6.3%
Apr-12	120.0	3.5%	125.5	5.8%
May-12	119.6	2.9%	125.1	5.3%
Jun-12	118.0	2.0%	123.5	4.3%
Jul-12	125.9	8.9%	125.9	4.1%
Aug-12	127.0	9.3%	127.0	4.5%
Sep-12	128.2	10.2%	128.2	5.4%
Oct-12	130.1	11.2%	130.1	6.3%
Nov-12	129.6	10.2%	129.6	5.4%

CPI Annual Growth in Nov 2012 = ((129.6/123) -1) *100 =

C- CPI Time Series

- From Jun-10 till Jun-12, the CAS did not register any increase in the Housing component of the CPI, as it did not have the means to assess the increase in housing rent. In July 2012, this component registered a 33% increase.

- BDL adjusted the series by orderly distributing the increase registered in Jul-12 across the 3 years.

- As a result, today's BDL measure of CPI growth rate is lower than CAS one.

Thank You