Current Methodologies and Results of Seasonally Adjusting Selected Philippine Time Series Data

by

The Technical Working Group on Seasonal Adjustment of Philippine Time Series
(Chaired by Lisa Grace S. Bersales)

For additional information, please contact:

Author’s name : Dr. Lisa Grace S. Bersales
Designation : Chair TC and TWG on Seasonal Adjustment of Philippine Time Series
Affiliation : School of Statistics, University of the Philippines
Address : Diliman, Quezon City
Tel. no. : (0632) 929-2875 / (0632) 981-8500 local 3503
E-mail : lisa_grace.bersales@up.edu.ph / lsbersales@gmail.com
Current Methodologies and Results of Seasonally Adjusting Selected Philippine Time Series
by
The Technical Working Group on Seasonal Adjustment of Philippine Time Series
(Chaired by Lisa Grace S. Bersales)

ABSTRACT

This paper presents the current methodologies and results of seasonally adjusting selected Philippine time series. Seasonal adjustment is the identification, estimation and removal of seasonal variations from a time series. Since seasonality of a time series can “mask” trend and cause difficulty in analyzing it, seasonally adjusted series are generated to provide appropriate analyses. Thus, enhancing the relevance and effectiveness of statistics as a tool for planning and decision-making.

In recognition of the importance of seasonally adjusting the most critical Philippine time series, the National Statistical Coordination Board (NSCB), in 1994 and 1996, designated the generation and release of seasonally adjusted time series of the following: (a) Palay production and prices by the Bureau of Agricultural Statistics (BAS); (b) Monetary aggregates/M3 by the Bangko Sentral ng Pilipinas (BSP); (c) Consumer Price Index (CPI), in particular, CPI for food, beverages and tobacco (FBT) and non-FBT items in the National Capital Region (NCR) and in areas outside the NCR (AONCR), by the National Statistics Office (NSO); and (d) National Accounts of the Philippines, specifically, the Gross National Product (GNP), Gross Domestic Product (GDP), GVA for the Agriculture, Fishery and Forestry (AFF) sector, Industry sector, Services sector and the Personal Consumption Expenditure (PCE), by the NSCB.

The designated time series of BAS and NSCB are being released quarterly while that of BSP and NSO are on a monthly basis. The seasonally adjusted time series of BAS, BSP and NSCB were first released in the second quarter of 1994 while the seasonally adjusted CPI of NSO was first released in August of 1996. The program X-11 ARIMA 2000 of Statistics Canada was used to seasonally adjust all the designated time series. Currently, the designated seasonally adjusted time series of NSCB and NSO are being released simultaneously while that of BSP and BAS have some time lag.

In line with the thrust of the Philippine Statistical System to continuously search for other time series for possible deseasonalization and designation, the Bureau of Labor and Employment Statistics (BLES) and the NSO have conducted tests of seasonality for their employment series. Results of the seasonality tests and seasonal adjustment for said series will be presented in this paper although these have not yet been designated.

I. Introduction

The development of the Seasonally Adjusted Philippine Time Series (SAPTS) in the Philippine Statistical System (PSS) was initiated in 1992 under the Asian Development Bank (ADB) Small-Scale Technical Assistance for the Seasonal Adjustment of Philippine Time Series. The project’s objectives were to upgrade the system of generating and analyzing the

---

1 A paper presented during the 10th National Convention on Statistics as a contributed paper under the session on Forecasting Techniques and Applications/Statistical Data Analysis. EDSA Shangri-La Hotel, 1-2 October 2007.
2 The system of designated statistics is a mechanism that identifies and generates the most critical and essential statistics required for social and economic planning/analysis based on approved criteria. The system defines the agency responsible, frequency of data production and schedule of data dissemination. It also indicates the major data items to be collected and the geographic level of disaggregation, among others.
statistical data series as practiced by different statistical agencies, and to institutionalize the seasonal adjustment of Philippine time series.

The ADB-assisted project saw its culmination through the institutionalization of seasonally adjusted Philippine time series in different statistical agencies like the Bangko Sentral ng Pilipinas (BSP), Bureau of Agricultural Statistics (BAS), Bureau of Labor and Employment Statistics (BLES), National Statistical Coordination Board (NSCB) and the National Statistics Office (NSO).

To provide technical supervision on the generation and analysis of seasonally adjusted Philippine time series, the NSCB Executive Board created the Technical Committee on Seasonal Adjustments of Philippine Time Series (TC-SAPTS) through NSCB Memorandum Order No. 6, Series of 1993. Subsequently, the TC-SAPTS created the Technical Working Group (TWG) on SAPTS. The TC-SAPTS was initially responsible for the release of seasonally adjusted series to the public but this was eventually taken on by the concerned agencies. The TC-SAPTS coordinates with all government agencies within the PSS in identifying which of the time series generated are to be tested for seasonality and other systematic components while the TWG is tasked to do the seasonal adjustments.

The TC-SAPTS, which was later reconstituted in 2005 through NSCB Memorandum Order No. 6, Series of 2005, is composed of experts in the field of time series analysis/seasonal adjustment and representatives of various agencies within the PSS. At present the TC is chaired by Dr. Lisa Grace S. Bersales, Dean of the UP-School of Statistics, with Dr. Romulo A. Virola, Secretary General of the NSCB, as Co-Chair. Members of the TC include Directors and immediate supervisors of the agency staff. Technical staff of BAS, BLES, BSP, NSCB, NEDA, NSO and SRTC who underwent training on seasonal adjustment methods and analysis, are members of the TWG. (*The full composition of the TC-SAPTS and TWG-SAPTS are in Appendix A and B, respectively.*)

In recognition of the importance of seasonally adjusting the most critical Philippine time series, the NSCB, in 1994 and 1996, designated the generation and release of seasonally adjusted time series of the following: 1) Palay production and prices by the BAS; 2) Monetary aggregates/M3 by the BSP; 3) Consumer Price Index (CPI), in particular, CPI for food, beverages and tobacco (FBT) and non-FBT items in the National Capital Region (NCR) and in areas outside the NCR (AONCR), by the NSO; and 4) National Accounts of the Philippines, specifically, the Gross National Product (GNP), Gross Domestic Product (GDP),
Personal Consumption Expenditure (PCE) and GVA for the Agriculture, Fishery and Forestry (AFF) Sector, Industry Sector, and Services Sector by the NSCB.

Also, in line with the thrust of the PSS to continuously search for other time series for possible deseasonalization and designation, the BLES and the NSO have conducted tests of seasonality for their employment series. Results of the seasonality tests and seasonal adjustment for said series will be presented in this paper although these have not yet been designated.

This paper contains 7 sections: Section 1 gives some background on the development and institutionalization of SAPTS in the PSS; Section 2 is a discussion on the basic concepts of seasonal adjustment; Section 3 describes the original time series of variables/indicators that are being deseasonalized for each agency covered; Section 4 provides information on the methodologies of generating seasonally adjusted series; Section 5 presents the seasonally adjusted time series by agency; Section 6 is devoted to the description of the peculiarities of the data series considered; and Section 7 lays out the future directions.

II. Seasonal Adjustment

A. What is seasonal adjustment?

A time series is a set of observations on a variable recorded for consecutive time intervals. Seasonal adjustment is an analysis technique that identifies, estimates and removes seasonal variations from a time series. It identifies the different components of the time series thereby reflecting its true behavior. Examples of seasonal variations are changes attributed to events that occur at a certain period every year such as Christmas season, school opening, planting season and moving holidays such as Easter and Ramadan.

In Chart 1, Gross Domestic Product (GDP) consistently exhibits slight upturns during the second quarter, drops in the third quarter, big increases in the fourth quarter, and reversals in the first quarter. This behavior of the time series that is repeatedly shown every year is called seasonality. Since seasonality occurs within a year, the time series that is adjusted for seasonality have time intervals of less than one year, say quarterly or monthly.
B. Why do we need to seasonally adjust?

Seasonality of the time series can “mask” trend movements and distort the economic picture. From Chart 1, it is difficult to discern turning points and the direction of the data. The movement of the data that keeps on recurring in one-year is known as the seasonal pattern. Turning points are the periods in a time series where the movements of observations start to change. Turning points are the “peaks” or the “troughs” of a series. The “peak” points are usually followed by a series of down trends called “recession”. On the other hand, a series of up trends after “depression” is called “recovery”.

Seasonal adjustment is mainly carried out for policy makers or policy advisers to enable them to see and analyze the trend from an economic time series without being obscured by seasonal movements. Knowledge of seasonal fluctuations is also of great use to corporate commercial policy. It explains short-term changes in variables such as demand for a certain product, e.g., daily fluctuations related to days of the week in retail sales, and hourly fluctuations related to hours of the day for electricity consumption.

For the unadjusted or original series, year-on-year growth rates are computed instead of period-on-period, i.e., the current period is compared to the same period of the previous year. This is done to ensure that the true movements in the series are captured and not just the fluctuations due to seasonality. In Chart 1, a comparison of the third quarter and the fourth quarter shows a very high growth because of the effects of agricultural harvests and the rise in consumer expenditures during All Saints Day and the Holiday Season (Christmas and New Year) during the fourth quarter. This means that industries produce more products
to be sold during the fourth quarter. In the same way, comparison of the first quarter with the fourth quarter manifests a significant contraction in growth because seasonal factors in the fourth quarter were not present in the first quarter of the following year. On the other hand, comparing the fourth quarter of the current year with the fourth quarter of the previous year assumes that the economic climate is the same, i.e., the fourth quarter of the current year and the previous year both have the effects of agricultural harvests, All Saints Day and the Holiday Season. However, the disadvantage of the year-on-year comparison is the delayed detection of turning points, that is, the peak or depression of the economy, because the seasonal effects hide its movement. It shows the same movement every year (Chart 1). Further, this method still includes some moving seasonal elements such as Easter holidays, which either fall during the first or second quarter, and irregular events, such as the eruption of Mt. Pinatubo and the 1990 earthquake, affecting both the current and previous periods. The use of year-on-year growths, therefore, is inadequate in mapping the trend of the economy on a quarterly basis. The trend shows the direction where the economy is going and can be used for predicting the quarterly performance of the economy. In a year-on-year comparison, the quarterly trend is obscured by seasonal and irregular factors. Hence, predicting the economy becomes less accurate.

C. How does a seasonally adjusted series look like?

If the time series is seasonally adjusted, seasonal variations are removed. Quarter-on-quarter changes due to the effect of identifiable, regularly repeated influences on the series are removed. Again, in Chart 1, high agricultural harvests, All Saints Day and the Holiday Season are regular events that occurred every fourth quarter of the year that affected the performance of the economy. Seasonal adjustment of a series would show a smoother series pattern. Chart 2 illustrates what happens to the series in Chart 1 after the seasonal fluctuations are removed. The effects of high agricultural harvests, All Saints Day and the Holiday Season in the fourth quarter are removed. Likewise, all other systematic seasonal fluctuations in all quarters are also taken out, like the Easter holiday, school openings and end of school year, among others. With all calendar-related influences removed, comparing the performance of the economy on a quarter-on-quarter basis now depicts an undistorted trend than the year-on-year comparison. With the seasonally adjusted series, economic policy-makers and analysts can accurately monitor short-term developments in the economy.
D. How do we adjust for seasonality?

Typically, an economic time series (O) has four unobserved components, namely:

- **Trend** (T) – the long term upward or downward movements of the time series due to influences such as population growth, price inflation and general economic development
- **Cyclical fluctuations** (C) – a quasi-periodic fluctuation characterized by alternating periods of expansion and contraction which is hypothesized to relate to economic fluctuations
- **Seasonal fluctuations** (S) – a regular periodic pattern that repeats from year to year; and
- **Irregular component** (I) – represents the non-systematic movements of the series caused by events of all kinds not captured by the other components; which may include outliers due to floods, typhoons, strikes or political crises

To remove the effects of seasonality, decomposition models are used. Decomposing a time series highlights important components of the data. A simple way to decompose is to make an assumption that any time series is made up of four basic components as discussed in the preceding paragraph: trend, cyclical fluctuations, seasonal fluctuations and irregular component. When choosing a decomposition model, the aim is to pick a model that yields...
the most stable seasonal component. For the national accounts series, two decomposition models are used:

- **Additive** \( O = T + C + S + I \)
- **Multiplicative** \( O = T \times C \times S \times I \)

Taking out the seasonal factor from the original series produces the following seasonally adjusted series:

- **Additive** \( O^\ast = O - S = T + C + I \)
- **Multiplicative** \( O^\ast = O \div S = T \times C \times I \)

To choose an appropriate time series model, data of the original series should be examined and tried for both models to choose the one that yields the more stable seasonal component. The original series is processed using the seasonal adjustment program and the seasonal component is tested for stable seasonality. The decomposition model that gives the more stable seasonality is the appropriate model that fits the series.

In an additive decomposition model, it is assumed that the components of the series are independent of each other, which implies that movements in trend do not affect the movements in seasonal component. This model is used if the seasonal effects are the same every year. The trend of the series changes but the magnitude of the seasonal fluctuations remains approximately the same.

The multiplicative decomposition model, on the other hand, is based on the assumption that the variation in the seasonal component is affected by the level of the trend. It means that the absolute size of the components of the series is directly related and dependent on each other. In addition, it means that as the trend increases (decreases), the amplitude of the seasonal component also increases (decreases).
III. DESCRIPTION OF THE ORIGINAL TIME SERIES

A. BAS

The BAS is the principal government agency under the Department of Agriculture (DA) mandated to collect, process, analyze and disseminate official statistics on agriculture and fisheries as inputs to policy and decision towards a sustainable agricultural development. Its major strategic thrust is the conduct of national surveys and monitoring activities for generating data on production and prices, marketing, costs of production and other socio-economic data in agriculture and fishery.

Current data series for which the BAS officially releases seasonally adjusted series are palay production and farm price, and wholesale and retail prices of rice. Data on palay production is collected by the BAS through its quarterly Rice and Corn Production Survey (RCPS) while farm, wholesale and retail prices are gathered through its Weekly Cereals and Fertilizer Price Monitoring (WCFPM). Price series on special palay was used for farm price levels while data on special or well-milled rice was considered for both wholesale and retail levels. In order to come up with a parallel series of production and prices, quarterly price series was derived as simple averages of the monthly average prices.

A.1 Palay production

As shown in Chart 3, palay production from 1988 to 2007 generally peaks during the fourth quarter of the year (Chart 3). The troughs were observed normally every third quarter but from 2003 to 2006, the lowest production level was shifted to the second quarter because of the movement of harvest from the fourth to the third quarter.

A.2 Farm prices of palay

As expected, farm prices of palay exhibited an upward trend from 1988 to 2006 with the biggest and abrupt increase observed in the 2nd quarter of 1995 (Chart 4). Highest average farm prices were recorded during the third quarters while the lowest were on the 4th quarter of each year.
A.3 Wholesale prices of rice

Wholesale prices of rice exhibited substantial increase in the 2nd quarter of 1995 (Chart 5). Peaks were noticeable every 3rd quarter except in 1988 and 1996 where prices peaked on the 2nd quarter. The lowest prices occurred during the 1st quarter of each year except in 1988, 1996, 1999 and 2001, during which, lowest prices were observed in the 4th quarter.
A.4 Retail prices of rice

At the retail markets, prices of rice were highest every third quarter and lowest every first quarter except in 1990, 1993 and 1995 where peaks were recorded in the fourth quarter and in 1991, 1996 and 1999 where troughs were observed also in the fourth quarter (Chart 6).
B. BLES

The BLES evolved from the Labor Statistics Service under the Department of Labor & Employment (DOLE). Created under Section 21 of Executive Order 126 dated 30 January 1987, the BLES is mandated to formulate, develop and implement plans and programs on the labor statistical system in order to provide the government with timely, reliable and accurate data on labor and employment and conduct nationwide surveys and studies which will generate trends and structures also, on labor and employment. Statistics are collected from four main surveys that the Bureau conducts, namely, BLES Integrated Survey, Occupational Wages Survey, General Survey on Labor Organization, and Labor Turnover Survey. Other important statistics related to labor and employment are derived from the Labor Force Survey (LFS), a quarterly survey conducted by the NSO designed to provide statistics on levels and trends of employment, unemployment and underemployment.

Within the course of the year, the country’s economic indicators (e.g. employment by sector and workers displaced) undergo fluctuations and/or subject to seasonal events, such as multiple effects of climates, seasonal weather disturbances, institutional events, reduced or expanded production, employment of seasonal workers during holiday seasons and the opening and closing of schools. In the country, double-digit unemployment rates are recorded during April. This observed phenomenon is due to the seasonal influx of new graduates and vacationing students searching for new/summer jobs during off-school months. However, data series on labor and employment are not yet designated. Seasonally adjusted BLES series on labor presented in this paper are the results of the seasonality tests conducted through the TWG-SAPTS in its continuous search for Philippine data series for possible deseasonalization and designation.

B.1 Displaced workers in establishments

Displaced workers are workers terminated due to permanent or temporary shutdown/closure of plant/unit/operation of establishment because of economic reasons. Data is principally gathered from Establishment Termination reports submitted monthly by employers to DOLE regional offices. Statistics obtained are consolidated, analyzed and processed by the BLES.
B.2 Percentage share of employed in the Industry sector

Percentage of employed by sector is taken from LFS and is derived as the ratio of employed by sector to total number of employed persons. Subsectors that make up the Industry sector are: (a) Mining and Quarrying; (b) Manufacturing; (c) Construction; and (d) Electricity, Gas and Water.

Employed persons include all those who, during the reference period are 15 years and over as of their last birthday and are reported either:

a. **At work** - those who do any work even for one hour during the reference period for pay or profit, or work without pay on the farm or business enterprise operated by a member of the same household related by blood, marriage or adoption; or

b. **With a job but not at work** - those who have a job or business but are not at work because of temporary illness/injury, vacation or other reasons. Likewise, persons who expect to report for work or to start operation of a farm or business enterprise within two weeks from the date of the enumerator’s visit are considered employed.

---

**Chart 9. Percentage Share of Employed in the Industry Sector**
C. NSCB

The NSCB is the highest policymaking and coordinating body on statistical matters in the country. Its objective is to develop an orderly statistical system capable of providing timely, accurate, sufficient, and useful data needed in planning and decision-making. Foremost among its functions is the regular generation of the country’s national accounts estimates. Some of the seasonal factors affecting the national accounts series include weather and climate which bears on agricultural harvests; holiday seasons, like Christmas and New Year where bonuses are given to employees causing an increase in consumer expenditure and demand, thereby resulting in increased production.

Through Executive Order No. 352, which was passed on 1 July 1996, the NSCB has established a system of designated statistics that will generate essential statistics for social and economic planning and analysis. By virtue of NSCB Resolution No. 6 Series of 1994, the generation and release of the Seasonally Adjusted National Accounts (SANA) was designated. Pursuant to the Resolution, SANA should be generated on a quarterly basis and released 60 days after the reference quarter. The following are the SANA series published by the NSCB: GDP, GVA in AFF, GVA in Industry, GVA in Services, GNP and PCE.

C.1 Gross Domestic Product (GDP)

Gross Domestic Product (GDP) refers to the value of all goods and services produced domestically in a specific period of time. One of the approaches in compiling GDP in the Philippine System of National Accounts (PSNA) is the production approach. Under the production approach, GDP is obtained by aggregating of the gross value added (GVA) of all resident producer units, adjusted for any taxes and subsidies on products not included in the values of their output. GVA is derived by deducting the cost of goods and services used up in the process of production from the total value of goods and services produced during the period.

The quarterly GDP series from 1988 to 2006 generally peaks in the fourth quarter while troughs are observed in the first quarter, except in 1991, 1992, 1993 and 1998 where the lowest point was on the third quarter (Chart 10). In general, the series moves upward
from the first quarter to the second quarter, goes down in the third quarter, peaks in the fourth quarter, and goes down in the first quarter of the following year.


C.2 Major sectors of the GDP

GVA in AFF is estimated by aggregating the GVAs of the Agriculture and Fishery sector and the Forestry sector while GVA in Industry is computed by summing up the GVAs of the following sectors: (a) Mining and Quarrying, (b) Manufacturing, (c) Construction, and (d) Electricity, Gas and Water. On the other hand, GVA in Services is the total of the GVAs of the following sectors: (a) Transportation, Communication and Storage (TCS); (b) Trade; (c) Finance; (d) Ownership of Dwellings and Real Estate; (e) Private Services; and (f) Government Services.

The sum of the GVAs of the three major sectors is equal to the GDP.

As shown in Chart 11, the peak quarter for all the major sectors of GDP is the fourth quarter. For Industry and Services, troughs are in the fourth quarter while for AFF, the
troughs manifest in the third quarter except from 2004 to 2006 where it showed in the second quarter instead. Generally, AFF moves downward from the first to third quarter of the year and goes up in the fourth quarter. Industry continuously moves upward from first to fourth quarter and goes down again by the first quarter of the following year. Services, on the other hand, follow closely the pattern of movements of the GDP.


C.3 GNP

GNP refers to GDP plus compensation and property income of Philippine residents earned abroad, less compensation and property income earned in our country by non-residents of the Philippines.

From 1988 to 2006, the GNP series displayed prominent peaks in the fourth quarter (Chart 12). Troughs were irregularly observed in the first, second and third quarters across the entire series. Generally, the series moves upward from the first to the second quarter, and from the third to the fourth quarter. On the other hand, it moves downward from the second to the third quarter and from the fourth to the first quarter of the succeeding year.
C.4 \textit{PCE}

PCE consists of actual and imputed expenditures of households for the purpose of acquiring individual consumption goods and services.


The PCE series from 1988 to 2006 show peaks in the fourth quarter and troughs in the first quarter (Chart 13). The series moves upward from the first quarter to the second quarter, goes down in the third quarter, peaks in the fourth quarter, and goes down in the first quarter of the following year.

D. \textit{NSO}

The NSO is the major statistical agency responsible for collecting, compiling, classifying, producing, publishing, and disseminating general-purpose statistics as provided for in Commonwealth Act (CA) No. 591.
One of the most important statistics generated by the NSO is the Consumer Price Index (CPI) which provides a general measure of the changes in average retail prices of commodities bought by specific group of consumers in a given area and in a given period of time. It mainly measures the composite change in the retail prices of the various commodities over time. In recognition of the usefulness of seasonally adjusted CPI in tracking short-term developments in the economy, the NSCB Executive Board approved the recommendation of TC-SAPTS through NSCB Resolution No. 8, Series of 1996, the designation of the generation and official release of seasonally adjusted CPI on a monthly basis, five days after the release of the regular CPI.

Another major statistics released by the NSO are employment related statistics. At present the generation of seasonally adjusted employment data series is not yet designated but the NSO, through the TWG-SAPTS, have conducted tests of seasonality on these. Results of such tests are presented in this paper.

**D.1 CPI series**

Seasonality in prices occurs with the seasonality in the availability of supply of goods and services, as well as in the demand for them. Availability of goods is affected by production cycles resulting from varying climatic conditions and availability of raw materials and other inputs to production. Seasonality in the planting and harvesting of crops in the different regions also resulted to seasonality in prices of some agricultural items especially
palay. Likewise, demand for certain goods and services change during special occasions such as opening of classes and holidays like the Christmas season. The practice of implementing changes/upward adjustments in service fees, etc. during the beginning of the year also affects prices.

The CPI was among those statistical data that was tested initially by the members of the NSO’s project team for seasonal adjustment. Initially, the 1988-based CPI monthly series was tested at the one and two–digit levels of CPI disaggregation for the Philippines, National Capital Region and Areas Outside the National Capital Region (AONCR) for seasonal adjustment. The results of the tests showed that among the series, only the aggregate CPI levels for FBT and non-FBT items in NCR and AONCR series registered presence of stable seasonality. The rest of the CPI series including the CPI for All Items for the three areas (Philippines, NCR and AONCR) under study indicated no seasonality mainly due to the opposite direction of peaks and troughs exhibited by the components of the series, thus, cancelling out their seasonality.

In 1996, with 1994 as the base year, the monthly CPI series utilizing the same coverage as the 1988-based series was also evaluated for seasonality using the X11ARIMA88 software that was later updated to X112000 to address 2K problem in data encoding. The results of the tests showed that only the aggregate CPI for FBT and Non-FBT items in NCR and AONCR were found to have stable seasonality, the same findings as that of the 1988-based CPI series. With the approval of the methodology and the release of the seasonally adjusted series for CPI for FBT and Non-FBT in NCR and AONCR by the TC-SAPTS, the NSO came out with a press release on August 10, 2001 informing the public the official results of the Seasonally Adjusted Consumer Price Index (CPI) for FBT as well as other non-FBT items for April and May 2001. A press release for the month of June 2001 was prepared and was officially released on August 10, 2001. For the July 2001, the press release came out on August 13, 2001. Succeeding press releases were regularly published on a monthly basis, not later than five working days after the press release of the original CPI series.

With the approval of the 2000-based CPI series under NSCB Resolution No. 13, Series of 2003, on December 12, 2003 and the discontinuance of the 1994-based CPI series effective January 2005, the NSO also adopted the 2000-based CPI seasonally adjusted series. Similar with the previous base years, the NSO evaluated the aggregate CPI levels for FBT and Non-FBT in NCR and AONCR for the 2000-based series using the same methodology utilized for the 1988 and 1994 series. On January 14, 2005, the TC-SAPTS
approved the official release of the seasonal adjustment for the 2000-based CPI for FBT and non-FBT items in NCR and AONCR. Starting with the January 2005 CPI series, the NSO was able to release the 2000-based seasonally adjusted CPI series simultaneously with the original CPI series, that is, five days after the reference month. The monthly report can be accessed in the NSO website (www.census.gov.ph).

The graphs of the original series of the following CPI series of NSO are shown in Charts 14 to 17: (a) CPI for FBT in NCR; (b) CPI for FBT in AONCR; (c) CPI for Non-FBT in NCR; and (d) CPI for Non-FBT in AONCR.

Chart 14. CPI for FBT in NCR: January 2000 - December 2006
(2000=100)
Chart 15. CPI for FBT in AONCR: January 2000 - December 2006 (2000=100)

D.2 Employment series

Employment statistics released by the NSO are generated from the Labor Force Survey (LFS), a nationwide survey of households undertaken every quarter to gather data on the demographic and socio-economic characteristics of the population. The survey is designed to provide statistics on levels and trends of employment, unemployment and underemployment for the country, as a whole, and for each of the administrative regions. The preliminary results of the survey are released officially every 15th of the end of the quarter.

Over the course of a year, the size of the country’s labor force, the levels of employment and unemployment and other measures of labor activity undergo fluctuations due to seasonal events such as composite effects of climates, institutional events, reduced or expanded production, harvests, employment of seasonal workers during holiday season and the opening and closing of schools where there are more graduates during April.

Because these seasonal events follow a more or less regular pattern each year, adjusting the statistics from quarter to quarter can eliminate their influence on statistical trends.
Starting April 2005, the new unemployment definition was adopted per NSCB Resolution Number 15 dated October 20, 2004. As indicated in the said resolution, the unemployed include all persons who are 15 years old and over as of their last birthday and are reported as:

1) Without work and currently available for work and seeking work; or

2) Without work and currently available for work but not seeking work for the following reasons:
   a. Tired or believed no work available
   b. Awaiting results of previous job application
   c. Temporary illness or disability
   d. Bad weather
   e. Waiting for rehire or job recall

However, the textual tables presented in this paper used the old definition for comparative purposes.

The graphs of the original series of the following employment series of NSO are shown in Charts 18 to 21: (a) Labor force participation rate; (b) Employment rate; (c) Unemployment rate; and (d) Underemployment rate.
Chart 18  Labor Force Participation Rate, Philippines: January 1997 to October 2006

Chart 19  Employment Rate, Philippines: January 1997 to October 2006
Chart 20. Unemployment Rate, Philippines: January 1997 to October 2006

Chart 21. Underemployment Rate, Philippines: January 1997 to October 2006
III. **Methodologies in Generating Seasonally Adjusted Series**

A. **Direct or indirect seasonal adjustment**

Time series can be seasonally adjusted directly or indirectly. The direct way is by adding all of the original series of lower components and seasonally adjusting the total. The indirect way is by summing up the seasonally adjusted series of lower components to come up with the seasonally adjusted total.

All designated Philippines time series data are directly estimated except for the seasonally adjusted GDP which is indirectly computed as the sum of the seasonally adjusted series of the three main sectors, namely: (a) Agriculture, Fishery and Forestry (AFF); (b) Industry; and (c) Services sectors. On the other hand, seasonally adjusted series of AFF, Industry and Services sectors are directly estimated, together with PCE and GNP. All original series of the sub-sectors of each major sector are added and each major sector total is seasonally adjusted. For instance, Industry has four sub-sectors namely, Mining and Quarrying, Manufacturing, Construction and Electricity, Gas and Water. The original series of these sub-sectors are added and the total Industry is seasonally adjusted. Ideally, the seasonally adjusted disaggregated GDP should be equal to the seasonally adjusted aggregated GDP. In reality, this may not be true. One reason is related to span. The detailed levels of components have shorter spans than the total series. The longer the series, the more significant the spans become, particularly in the seasonal patterns.

B. **The X11 ARIMA**

The X-11 ARIMA Software developed by Statistics Canada is used to seasonally adjust the Philippine time series. ARIMA stands for AutoRegressive Integrated Moving Average. The type of decomposition model to be tested by the software is specified by the user. Thus, to determine which model is appropriate for the time series, two runs are made: one for the additive model and another for the multiplicative model. The Analysis of Variance (ANOVA) F-Test, the Kruskall-Wallis (KW) Statistics Test and twelve diagnostic tests are applied for both models. The ANOVA F-test and KW Statistics test are tests for stable seasonality, moving seasonality and residual seasonality. The 12 diagnostic tests are for the performance of the model. Whichever model gives the best results of the tests is fitted to the series.
The X-11 ARIMA is based on an iterative estimation procedure, the core of which comes from different sets of moving averages. The program contains three main blocks of operations. First, the series may be pre-adjusted for outliers or level shifts in the series. Second, the pre-adjusted series will be seasonally filtered and extreme values adjusted. Lastly, various diagnostics and quality control statistics are computed, tabulated and graphed.

B.1 Output of X11 ARIMA

The outputs of the X-11 ARIMA software include:

1. Statistics on the test for the presence of seasonality
   - Stable seasonality
   - Moving seasonality
   - Residual seasonality
2. Seasonal factors of the series
   - Including seasonal factors for the next seasons equivalent to one year (forward seasonal factors)
3. Series adjusted for seasonality
4. Trend-cycle of the series – seasonal and irregular components are removed leaving the trend and cycle components
5. Irregular component
6. Diagnostics on the performance of the model

The decision on the more appropriate decomposition model to be adopted, i.e., whether additive or multiplicative, is determined from results of (1) and (6) above.

Some basic statistics that have to be examined in choosing the appropriate model for the series include F-tests statistics, Kruskall-Wallis non-parametric statistics and M- and Q-test statistics. F-tests statistics and Kruskall-Wallis non-parametric statistics are used to test the existence of stable seasonality. The higher the value of the statistics, the more stable the seasonality of the time series. A time series has a stable seasonality if it has no or minimal moving seasonality and no residual seasonality. F-tests are used to detect moving seasonality and residual seasonality. The lower the F-value, the presence of moving seasonality is on the minimum or none at all and the lesser the evidence of residual
seasonality. M- and Q- test statistics are used for the quality assessment of the model chosen. These statistics are part of the output generated by the X-11 ARIMA.

B.1.1 BAS

B.1.1.1 Palay production

The initial run to test the presence of seasonality for palay production using X11-ARIMA covered the period 1985 to 1992 quarterly series. Results showed that seasonality is present with no failing statistical measures but all built-in models failed to fit the series for both additive and multiplicative seasonal adjustment methods. A user-supplied model $(2,1,2) (0,1,1)$ was forced for both additive and multiplicative which gained better results than the initial runs. These preliminary runs indicated that the multiplicative model fits better than the additive model for palay production series. Thus, using the model $(2,1,2) (0,1,1)$ for multiplicative decomposition was tried for both with and without logarithmic transformation. Higher F-value was given by the model with logarithmic transformation but with one failing statistical measure (M5), hence the model $(2,1,2) (0,1,1)$ without logarithmic transformation was considered. Further, this model was compared with multiplicative model $(0,2,2) (0,1,1)$ to test its stability. Results indicated that the former fits better than the latter model.

Finally, the model chosen for palay production was the multiplicative model $(2,1,2) (0,1,1)$ with no logarithmic transformation. This final model was being used and validated for its fitness after one complete year of observations.

When the NSCB approved the release of the seasonally adjusted palay production as one designated statistics, the series was cut starting from 1988 and updated every quarter for deseasonalization purposes using the final model chosen.

B.1.1.2 Palay/rice prices

The preliminary runs performed for prices using the monthly average farm, wholesale and retail from 1988 to 1992 showed seasonality of all the series. But, for analytical consistency with palay production, quarterly prices derived from the monthly average price series were used. The default options of the X11-ARIMA on the initial run for the quarterly farm price series chose an additive model $(0,1,1) (0,1,1)$. All built-in ARIMA models and two statistical measures (M1 and M6) failed on the multiplicative
run, the model (0,1,1) (0,1,1) without logarithmic transformation was forced for the farm prices series.

Results of the preliminary runs for both quarterly wholesale and retail prices of rice yielded an additive model (0,1,1) (0,1,1) and multiplicative model (0,1,1) (0,1,1) with logarithmic transformation. Since the F-values of the multiplicative models for both series are higher than the additive, the model (0,1,1) (0,1,1) with logarithmic transformation fits the wholesale and retail prices of rice. However, when the series were updated to the 4th quarter of 1994, new multiplicative model (2,1,1) (0,1,1) was found better fit for wholesale price series.

B.1.2 BLES

The following models were derived:

1. Displaced workers for establishments with less than 20 workers: Multiplicative model (0,1,1) (0,1,1) with log transformation

2. Displaced workers for establishments with 20-99 workers: Multiplicative model (0,1,1) (0,1,1)

3. Percentage share of employed in the Industry sector: Multiplicative model (0,1,1) (0,1,1) with log transformation

B.1.3 NSCB

The following decomposition models were used in the seasonal adjustment of national accounts:

1. GVA of AFF: Multiplicative model (0,1,1) (0,1,1) with log transformation
2. GVA of Industry: Additive model (0,1,1) (0,1,1)
3. GVA of Services: Multiplicative model (0,1,1) (0,1,1) with log transformation
4. GDP: Indirect method, that is, sum of seasonally adjusted GVA of AFF, Industry and Services
5. GNP: Additive model (0,1,2) (0,1,1)
6. PCE: Multiplicative model (0,1,1) (0,1,1) with log transformation
B.1.4 NSO

B.1.4.1 CPI series

Similar with the 1994-based CPI series coverage, evaluation for seasonal adjustment
for the 2000-based was done in NCR and AONCR. The data series evaluated
covered the period January 1988 to December 2006. The presence of stable
seasonality though, was observed both for FBT and non-FBT items in NCR and
AONCR when analyzed separately using the X112000 built-in model (Multiplicative
with log-transformation (0,1,1)(0,1,1) and Additive (0,1,1)(0,1,1)) also fit to the 2000-
based CPI data series.

B.1.4.2 Employment series

The seasonally adjusted series of employment status covered the period January
1997 to October 2006. Using the X11ARIMA (Auto-Regressive Integrated Moving
Average) Version 2000, it was noted that seasonality was present in the original
series of the Labor Force Participation Rate (LFPR), Employment, Unemployment
and Underemployment Rates.

B.1.4.2.1 Labor force participation rate (LFPR)

The model chosen for LFPR was the multiplicative model (0,1,1) (0,1,1) with
logarithmic transformation since it yielded a higher F-value. It was noted in the
results of the run that two statistical measures failed. These are M3 and M10.

B.1.4.2.2 Employment rate

Results of the run for both additive and multiplicative models revealed that four
statistical measures (M1, M2, M3 and M5) failed. Since the F-value for the
multiplicative model for the series is higher than the additive seasonal
adjustment, the model (0,1,1) (0,1,1) with logarithmic transformation was
chosen.

B.1.4.2.3 Unemployment rate
The model chosen for the unemployment series is the additive run \((0,1,1) (0,1,1)\) which has a higher F-value with transformation-none. The model has three statistical measures that failed (M1, M3 and M5).

**B.1.4.2.4 Underemployment rate**

The results for the unemployment series showed that there were eight statistical measures that failed (M1, M2, M3, M5, M8, M9, M10 and M11). The model chosen for this series is the additive run \((2,1,0) (0,1,1)\) which has a higher F-value with transformation-none.

**B.2 Concurrent adjustment vs. maintenance of forward seasonal factors**

A major distinction between concurrent adjustment and forward seasonal factor is the use of the most recent 12-months seasonal factors under the forward method as a proxy for current period seasonal factors. Concurrent adjustment uses the most recent data up to the current time period (month or quarter) to estimate the seasonal component. Forward seasonal factors provide static estimates once per year while concurrent adjustment creates accurate but less static estimates as new data are introduced each time period.

All designated Philippine time series adopts the concurrent adjustment approach except for the national accounts data series of NSCB wherein seasonal factors are forecasted four quarters ahead based on the latest final data. Seasonal adjustment runs are conducted every May round estimation when the revised annual series for the last three years are finalized. The forecasted seasonal factors generated by X-11 ARIMA are used in the succeeding quarters’ seasonal adjustment. If the model is additive, the original series are seasonally adjusted by subtracting the forecasted seasonal factors. On the other hand, if the decomposition model is multiplicative, the original series are divided by the estimated seasonal component index to extract the seasonally adjusted series.

**C. Dealing with changes in definition/methodology in the generation of data**

Official statistics, as an evolving science, respond to changes in the economy and society, its structure and its priority areas as well as to developments in the global
community. As a result, concepts, definitions and classifications change and international guidelines are revised and updated. Likewise, improvements in statistical methodologies and the need of researchers and econometric modelers for comparable, consistent and long data series require that past estimates computed using old methodologies be revised.

In the case of the national accounts estimates of the NSCB, the unadjusted levels used from the first quarter of 2000 up to the current quarter of the Industry sector series are not the same as in the published levels. This was due to the unlinked 1999 to 2000 Construction subsector quarterly series as a result of the improvement in the data source of the said sub sector. Affected by these changes were the GDP and GNP series. For the purpose of linking the time series, 2000 first to fourth quarter levels of Construction as of January 2003 were maintained and extrapolated by the trend of the published levels of Construction from 2001 up to the current quarter, thus, yielding the new quarterly levels estimate of construction from 2001 up to the current quarter. To come up with the new levels for the Industry sector, the published quarterly levels of Construction from 2000 up to the current quarter were deducted from the Industry sector and the new levels of the Construction were added. To compute for the new levels of GNP, the published Industry levels were deducted and the new Industry sector estimates were added to the total GNP. The GDP was obtained by summing the published levels of AFF and Services sectors plus the adjusted levels of Industry sector.

IV. Seasonally Adjusted Time Series

A. BAS

A.1 Seasonally adjusted palay production

The 1988 to 2006 palay production series showed remarkable decreases during the third quarter of 1992, 1993 and 1998 (Chart 22). Highest production generally cropped up every fourth quarter and down every third quarter. In 2006 however, the highest production was registered in the third quarter while the lowest was in the fourth quarter.

The fourth quarter 2006 drop in palay production by 4.47 percent and 2.03 percent from its quarter and year-ago levels was a result of crop damages during the last quarter of the year caused by typhoons Milenyo, Paeng and Reming in Southern Tagalog, Bicol, Eastern Visayas and Cagayan Valley.
A.2 Seasonally adjusted farm price of palay

Significant increase in the farm prices of palay started in 1995 and further moved upward in 1996 up to 2006 (Chart 23). In the fourth quarter of 2006, the price of palay at farmgate was P0.15 or 3.3 percent higher than the previous quarter’s level. Compared to its year-ago level, farm prices of palay went up also by P0.15 per kilogram or 10.1 percent. This price increment was due to the decreased production during the quarter.
A.3  Seasonally adjusted wholesale price of rice

Rice prices at wholesale followed an upward direction throughout the period (Chart 24). The noticeable increase in 1996 prices was due to the increase in farm prices during the period. In 2006, the fourth quarter wholesale price of rice rose by 2.97 percent and 3.60 percent from its previous quarter and year-ago levels, respectively.

![Chart 24. Seasonally Adjusted Wholesale Prices of Rice, Q1 1988 – Q4 2006](chart)

A.4  Seasonally adjusted retail price of rice

At the retail level, rice prices followed the same direction as in wholesale prices with remarkable increment in 1996 (Chart 25). The fourth quarter 2006 retail price of rice was higher from its preceding quarter’s level by 2.19 percent and from last year’s level by 2.83 percent.

B.  BLES

B.1  Seasonally adjusted displaced workers in establishments

From the 10 data series gathered from the Establishment Termination reports of DOLE, only two were identified having seasonality and moving seasonality, namely, displaced workers in establishments employing less than 20 workers, and displaced workers in establishments employing 20-99 workers. The rest had unidentifiable seasonality or no evidence of seasonality attributed to a highly irregular series.
For the two data series with seasonality, the original series was plotted versus the trend cycle (tc) due to the high irregularity in the series.

As shown in Chart 26, from January 1995 to July 1997, displaced workers for establishments employing less than 20 workers ranged from 200 to 400, after which the series became irregular (post economic crisis). The series started to stabilize in mid 2000 and from thereon displayed a consistent upward trend.
Displaced workers in establishments employing 20-99 workers (Chart 27) show two periods of continuous upward movement, that is, April 1997 to July 1998 (Asian financial crisis) and the whole year of 2001.

**Chart 27. Displaced Workers in Establishments Employing 20-99 Workers**

Jan 1995 - Oct 2002

---

**B.2 Seasonally adjusted percentage share of employed in the Industry sector**

From among the data series on percentage share to employment by sector, only percentage share of Industry sector exhibited seasonality. Percent share of AFF and Services sectors had unidentifiable seasonality attributed to a highly irregular series.

Chart 28 shows that except in 2001, the original series peaks in April then goes down in the succeeding quarters. In the seasonally adjusted series, starting 1999, the share of industry levels off at 16.0 percent except in January 2001 and January 2003.

---

**C. NSCB**

The first seasonally adjusted national accounts (SANA) series was released and published in 1994 with the first quarter of 1988 as the start of the series and these are now published simultaneously with the quarterly national accounts. Quarterly data used were the estimates as of January 2007 from 1988 to 2006. To extract the seasonality of the four quarters in 2006, forecasted seasonal factors for each quarter were used and the quarter on quarter growth rates were obtained.
C.1 Seasonally adjusted major sectors of GDP

The seasonally adjusted AFF declined by 0.5 percent in the fourth quarter of 2006 from a lower contraction of 0.1 percent in the previous quarter (Chart 29). This was caused by a series of super typhoons that hit the country in the said quarter. Meanwhile, the seasonally adjusted Industry gained 0.4 percent in the fourth quarter of 2006, albeit at a slower pace compared to 0.6 percent growth during the previous quarter. The seasonally adjusted Services expanded by 2.1 percent in the fourth quarter of 2006 an improvement from the previous quarter growth of 1.7 percent. From 1988 to 2006, seasonally adjusted major sectors of GDP show an increasing trend with Services on top of the two other major sectors. AFF exhibited the biggest increase of 10.8 percent in the fourth quarter of 1993. Industry showed the biggest growth of 4.9 percent in the first quarter of 1994 while Services increased by 2.4 percent in the second quarter of 2004. All the quarters of Services sector posted a positive growth except on the first quarter of 1991 and second quarter of 1992.
C.2 Seasonally adjusted GDP

The seasonally adjusted GDP posted a growth of 1.0 percent in the fourth quarter of 2006 as a result of the steady growth of the Industry and Services sectors that negated the decline in the AFF (Chart 30). From 1988 to 2006, the trend of seasonally adjusted GDP is increasing. The biggest growth was seen in the fourth quarter of 1989 posting a 2.9 percent expansion. However, in 1998, the seasonally adjusted GDP posted a negative growth in the three quarters such as first quarter, second quarter, and fourth quarter.
C.3  *Seasonally adjusted GNP*

The seasonally adjusted GNP registered a robust growth of 3.0 percent in the fourth quarter of 2006 from 0.5 percent growth in the third quarter of 2006 due to the growth of the Net Factor Income for Abroad (Chart 31). The seasonally adjusted GNP showed an increasing trend from 1988 to 2006. The biggest increase was exhibited in the fourth quarter of 1991 by 4.1 percent. In 1998, the series declined three times, in the first, second and fourth quarter.


C.4  *Seasonally adjusted PCE*

The seasonally adjusted PCE accelerated to 1.6 percent in the fourth quarter of 2006 from 1.2 percent in the third quarter of 2006 (Chart 32). From 1988 to 2006, the seasonally adjusted PCE showed an upward trend. All the quarters posted positive growth except on the first quarter of 1991 and the second quarter of 1992.
D. NSO

D.1 Seasonally adjusted CPI

Results presented include the period January 2000 to December 2006 for the CPI levels while a short discussion on the comparison of the month-on-month change of the CPI levels focused only on the most recent two years, i.e., 2005 and 2006.


D.1.1 Seasonally adjusted CPI for FBT in NCR

The original and the seasonally adjusted CPI for FBT in NCR from January 2000 to December 2006 generally stood at almost the same levels with the original CPI levels consistently higher than of the seasonally adjusted CPI during January and December.
The observance of the holidays during these months generally pushed up the prices of FBT items in the area relative to the expected trend.

Chart 33.b compares the month-on-month percent changes in the unadjusted and the seasonally adjusted CPI for FBT in NCR from January 2005 to December 2006. During these periods, the two series moved at the same directions except for February 2005 and December 2006 when the two series showed opposite growth trends.
D.1.2 Seasonally adjusted CPI for FBT in AONCR

Similarly, the original and seasonally adjusted CPI for FBT items in AONCR from January 2000 to December 2006 generally stood at almost the same levels (Chart 34.a). The original CPI levels were consistently higher than that of the seasonally adjusted CPI during the months of January, February, August and September for all the years under review. This indicates that the seasonal factors pushed up the prices of FBT items in AONCR during these months. However, the seasonal factors during the month of December pulled down prices of FBT items in AONCR from 2000 to 2006.

From January 2005 to December 2006, an opposite trend in the month-on-month growth rates between the original and seasonally adjusted CPI for FBT in AONCR was only noted in December 2006 (Chart 34.b).

D.1.3 Seasonally adjusted CPI for non-FBT in NCR

CPI for non-FBT items in NCR for the original and the seasonally adjusted series stood at almost the same levels during the period in review (Chart 35.a). The original CPI levels were generally higher than the seasonally adjusted CPI during the first quarter of each
year and during the months of June and July from 2000 to 2006. The two series moved relatively at the same direction during the period in review except in September 2006.

Chart 34.a  CPI for FBT in AONCR: January 2000 - December 2006
(2000=100)

Chart 34.b  Month-on-Month Change in CPI for FBT in AONCR
January 2005 - December 2006
(2000=100)
D.1.4  Seasonally adjusted CPI for non-FBT in AONCR

The original and seasonally adjusted CPI for non-FBT in AONCR almost stood at the same levels from January 2000 to December 2006 (Chart 36.a). Higher levels of the original CPI for non-FBT items in the area were consistently registered during the months of June, July and August during the period. Except in December 2006, the original and seasonally adjusted CPI moved in the same direction.
D.2 Seasonally adjusted LFS data series by the NSO

D.2.1 Seasonally adjusted labor force participation rate

Labor force participation rate is generally highest every April round (Chart 37). The seasonally-adjusted labor force participation rate dropped by 1.1 percentage point from 67.3 percent in July 2006 to 66.2 percent in October 2006.
Measured on quarter-to-quarter basis, the labor force participation rate posted a negative growth of 1.7 percent in October 2006 from a positive growth of 1.3 percent in July 2006.

**D.2.2 Seasonally adjusted employment rate**

The series displayed a downward trend but the seasonally adjusted employment rate leveled to 88.0 percent in July to October 2004 (Chart 38).

Quarter-to-quarter changes on employment rate exhibited a decline of 1.5 percent in July 2006 but increased by 0.9 percent in October 2006.

**D.2.3 Seasonally adjusted unemployment rate**

The seasonally adjusted unemployment rate in the country increased to 11.7 percent in July 2006 from 10.4 percent in April 2006 but lowered to 10.9 percent in October 2006 (Chart 39).

Seasonal factors such as the employment of seasonal workers, specifically in the services sector during holiday season caused unemployment to drop and consequently employment to rise up. Quarter-to-quarter changes on unemployment recorded a positive
growth of 1.3 percent in July 2006 but exhibited a negative growth in October 2006 at 0.8 percent.

Chart 38. Employment Rate, Philippines: January 1997 to October 2006

Chart 39. Unemployment Rate, Philippines: January 1997 to October 2006
D.2.4 Seasonally adjusted underemployment rate

The series displayed a downward trend starting from July 2000 to January 2005 (Chart 40). Quarter-on-quarter changes dropped to 1.0 percent in January 2005 but recovered to a positive growth of 7.1 percent in April 2005.

Chart 40. Underemployment Rate, Philippines: January 1997 to October 2006

V. Peculiarities of the Series

A. BAS

Among the series for seasonal adjustment, palay production is more stable than prices. However, palay production can be adversely affected by irregular factors, such as changes in weather, prices of inputs, etc., but can be improved with good weather condition, sustained usage of hybrid and high quality inbred seeds, adequate fertilizer application and other interventions. The wholesale and retail prices of rice series show erratic movements during the period covered. These series behaved accordingly with the level of rice stocks and supply in the market.
B. BLES

Short length of data series made it difficult for ARIMA to detect the presence of seasonality. Problems were also encountered in cases where there are cuts/gaps in data series.

C. NSCB

Among the time series that the NSCB is seasonally adjusting, the AFF is the most erratic in its movement. Traditionally, AFF follows seasonal patterns but with the advent of technologies, these patterns are changing. Coupled with some irregular factors, such as changes in weather, the seasonally adjusted AFF is becoming more irregular in its movements.

D. NSO

Seasonality in the CPI for FBT and non-FBT are stable but very weak, which is expected since there are only two seasons in the country and they do not spell great difference in the consumption pattern of the people and in the production cycles of goods and services.

VI. Future Directions

On palay production and palay/rice price data series

- Simultaneous release of original and seasonally adjusted series of palay production and prices

On the employment/unemployment data series
- Regular release of seasonally adjusted employment data from the LFS taking into account the break in the data series as a result of the adoption of the revised concept of unemployment
- Test of seasonality on DOLE administrative-based data and data from BLES surveys once the lengths of data series become adequate enough for seasonal adjustment

On the national accounts data series
- Seasonal adjustment of the following sectors that accounted for the biggest shares of the GDP in 2006 and which exhibited seasonality based on X11 ARIMA runs: (a) Manufacturing; (b) Agriculture and Fishery; (c) TCS; and (d) Private Services
- Seasonal adjustment of the major sectors of the economy using the indirect method
- Revision of starting point from first quarter of 1988 to first quarter of 1998

On the CPI data series
- Test of seasonality in the aggregate CPI by sub-group (two-digit level) and major group (one-digit level) other than FBT and non-FBT at the national level including NCR and AONCR using the latest CPI series, i.e., base year 2000.
References


Appendix A

Composition of the Technical Committee on Seasonal Adjustment of Philippine Time Series (TC-SAPTS)
(As of September 2007)

Chair:

Lisa Grace S. Bersales
Dean, UP School of Statistics

Co-Chair:

Romulo A. Virola
Secretary General, National Statistical Coordination Board

Members:

Ludivinia Gador
Acting Deputy Director, Bangko Sentral ng Pilipinas

Romeo S. Recide
Director, Bureau of Agricultural Statistics

Elsie Carmen C. Buenaobra
Supervising Labor and Employment Officer
Bureau of Labor and Employment Statistics

Elena G. Varona
Statistician IV, Industry and Trade Statistics Department
National Statistics Office

Gervacio G. Selda
Executive Director, Statistical Research and Training Center

Jose Ramon G. Albert
Research Fellow, Philippine Institute for Development Studies

Amador S. Foronda
Statistical Coordination Officer IV, Integrated Accounts Division
National Statistical Coordination Board
Appendix B

Composition of the Technical Working Group on Seasonal Adjustment of Philippine Time Series (TWGC-SAPTS)
(As of September 2007)

Chair:

Lisa Grace S. Bersales
Dean, UP School of Statistics

Members:

Plenee Grace J. Castillo
Bureau of Agricultural Statistics

Alegria Mota
Bureau of Agricultural Statistics

Elsie Buenaobra
Bureau of Labor and Employment Statistics

Jerome Gacula
Bureau of Labor and Employment Statistics

Eleonor S. Genuino
Bangko Sentral ng Pilipinas

Mary P. Santos
Bangko Sentral ng Pilipinas

Elena Varona
National Statistics Office

Estelita Marquez
National Statistics Office

Margie Pamada
National Statistics Office

Amador S. Foronda
National Statistical Coordination Board

Mark Rex S. Romaraog
National Statistical Coordination Board