

X-12-ARIMA Seasonal Adjustment in Korean National Income Statistics and Money and Banking Statistics

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1. Introduction

Quarterly and monthly economic time series contain seasonal fluctuations caused by monthly or quarterly changes in season, by holidays and by social customs. Seasonal fluctuations obscure our understanding of the basic trend of the statistics. It is necessary to remove seasonal factors in order to understand the underlying trend of economic time series.

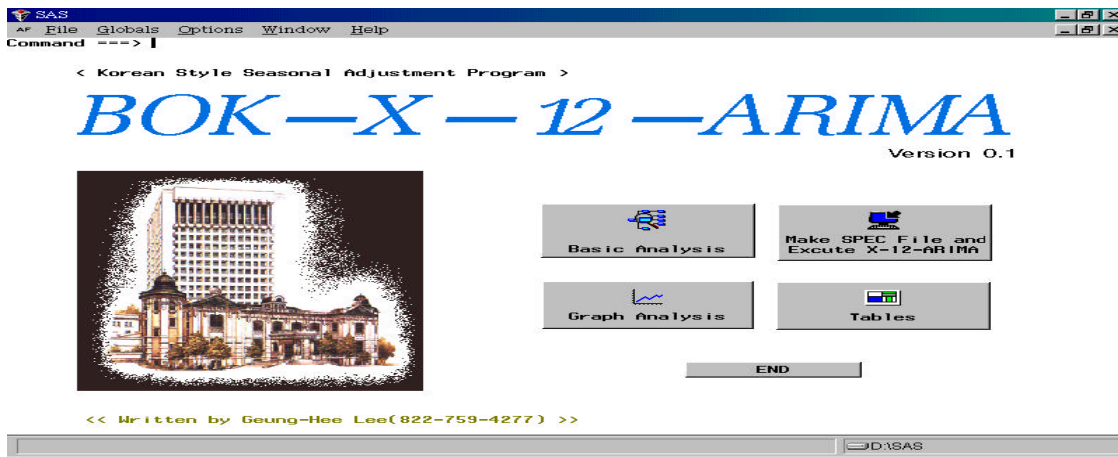
The Bank of Korea compiles seasonally adjusted statistics for national income statistics and money and banking statistics via a Korean seasonal adjustment model BOK-X-12-ARIMA, developed in 1999 by adjusting the X-12-ARIMA of the U.S. Bureau of the Census.

In this paper, we discuss BOK-X-12-ARIMA and summarize how the Korean national income statistics and money and banking statistics are compiled.

2. BOK-X-12-ARIMA

Korean economic time series contain variations individual to Korea, due to Seol (Lunar New Year's Day), Chuseok (Korean Thanksgiving Day), election days, national holidays, changes in the social or economic system, and so on. These are unlike those of the West, and thus we have great difficulty in adequately removing seasonality from Korean time series using either the rate of change from the year before or a popular Western seasonal adjustment method - X-12-ARIMA. It is necessary to use a seasonal adjustment method suitable for Korean economic time series.

The Bank of Korea developed the menu-driven program for a Korean style seasonal adjustment method based on X-12-ARIMA and SAS. We call it BOK-X-12-ARIMA. In the program, dummy variables can be generated to estimate the effects of Seol, Chuseok, national holidays, etc. Users can make flexible dummy variables according to type of weight and the effect of the spreadover period. In addition, the program provides various summarized results and graphs.



<Figure 1> Main menu of BOK-X-12-ARIMA

3. Seasonal Adjustment in Korean National Income Statistics and Money and Banking Statistics

Seasonally adjusted estimates for total GDP at current and constant prices are derived by aggregating the seasonally adjusted estimates for 77 components, according to the types of economic activities. Moreover, seasonally adjusted estimates for 24 expenditure components are derived. Seasonally adjusted estimates for GDP deflators are calculated by dividing seasonally adjusted estimates for GDP at current prices by seasonally adjusted estimates for GDP at constant prices.

Seasonally adjusted statistics for M1, M2, MCT, M3 and DMB (Deposit Money Bank) Loans are compiled. These statistics are derived by aggregating the seasonally adjusted estimates for their respective components, such as Cash, Deposit, Quasi-money, etc.

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