

# Methods of Evaluating Forecast Uncertainties, and Results of Calculation

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Most central banks regularly develop economic forecasts and announce the growth paths of major macroeconomic variables including the growth rate and inflation in the form of probability distributions. Uncertainties as to the growth paths as well as the baseline forecasts affect their policy decisions, and so central banks share information on them in efforts to enhance their policy transparency.

In this regard, the Bank of Korea releases fan charts on the probability distributions of its forecasts for the growth rate, inflation and the current account. Fan charts are effective for grasping the growth paths of individual economic variables and the Bank of Korea's assessments of their risks. These charts, however, have limitations when it comes to showing the uncertainties surrounding diverse macroeconomic variables overall. Particularly, under a flexible inflation targeting regime that pursues both price and economic stability, it is difficult to say that fan charts provide sufficient information necessary for policy decision-making.

In this regard, this paper examines a method of estimating a bivariate two-piece normal distribution able to consider uncertainties in both the inflation and the economic growth forecasts simultaneously. It shows that a coefficient of correlation between the economic growth and inflation forecasts, necessary for the creation of joint probability distributions, can be estimated by combining, through an economic model, the information used in the making of the fan charts and the economic forecasts.

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The bivariate asymmetric normal distribution drawn up using the method in this paper enables users to evaluate uncertainties of both variables, while at the same time maintaining consistency with the individual fan charts released by the Bank of Korea. Calculation according to this distribution of the uncertainties of the July and October 2015 forecasts well reflects the recent changes in economic conditions in which the volatilities of exchange rates and oil prices have grown.

To improve the assessment of forecast uncertainties the following efforts are required: first, uncertainties concerning structural shocks need to be identified with greater accuracy, by using indicators of uncertainty in the financial and foreign exchange markets. Efforts are also important to minimize model misspecification errors, through constant improvement and management of the macroeconomic models used in the assessment of forecast uncertainties.

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I . Introduction

II . Evaluation of forecast uncertainties using fan charts

III . Method of deriving a joint probability distribution using a macroeconomic model

IV . Results of joint probability distribution calculation

V . Conclusion