Leading Indicators for Turkey

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Introduction

- ☐ We develop a set of leading indicators to predict real activity and inflation at the monthly level for Turkey.

- ☐ We examine 35 real and financial candidate indicators for forecasting output growth and inflation over the period 2001:1-2010:12.

- ☐ Our study covers the period since 2001 to account for the institutional and policy changes in this period.

- ☐ These include the adoption of the inflation targeting regime and floating exchange rates.

Related Literature

- [ ] The literature on leading indicators is vast.

- [ ] Stock and Watson (1999) summarize the cyclical behavior of the main U.S. macroeconomic time series over the postwar period.

- [ ] Stock and Watson (2001) examine the efficacy of asset prices for predicting output and inflation for 7 OECD countries. Their sample period covers 1959-1999.

Related literature

- The literature on developing leading indicators for emerging economies is more recent.

- Leigh and Rossi (2002) examine the efficacy of 42 candidate indicators for growth and inflation over the period 1986-2002 for Turkey. Their study examines mainly financial indicators.

- Chauvet (2001) develops an indicator of Brazilian GDP at the monthly frequency. She uses a Markov switching dynamic factor model to account for regime changes in the Brazilian business cycle.

Related literature

- [ ] Chauvet (2000) uses a stochastic Markov switching model to determine the turning points in inflation for Brazil. She then fits a dynamic factor model to extract common cyclical movements in a set of variables useful for predicting inflation.

- [ ] Chauvet and Morais (2008) use a time-varying autoregressive probit model for predicting recessions in Brazil. They find that among the best indicators are variables measuring the early production stages.

Methodology

☐ Following Stock and Watson (2001) and Leigh and Rossi (2002), we develop h-step ahead forecasts of the growth of the industrial production index (IPI) and inflation (CPI) for h=1,…,12.

☐ We consider own lags of the variables as well as other candidate series.

☐ We allow for lags up to 12 months.

Methodology

- ☐ We first estimate an autoregressive specification for IPI growth and inflation using only the own lags of the variables. The optimal lag length is chosen using model selection criteria such as AIC.

- ☐ We iteratively add exogenous variables including their all possible lagged values up to 12 lags and choose the optimal lag length choosing AIC.

- ☐ To identify a leading indicator variables, we compare the RMSE of the autoregressive specification comprising own lags only with the specification including the exogenous variables and their lags.

- ☐ A leading indicator is identified if the relative RMSE of the specification with the exogenous variable is less than the one with the own lags of the predicted variable.

Data

- Unlike the study by Leigh and Rossi (2002), we consider both non-financial and financial series.

- Our candidate variables include the oil price index, monetary aggregates and total credit, various interest rates, return on the ISE index, dollar exchange rate, real exchange rate, capacity utilization, VAT revenue, electricity production, exports, imports, intermediate goods imports, trade balance, production of agricultural machines, production of buses, unemployment rate, and total employment.

Results

- ☐ IPI growth
  - ■ Based on relative RMSE, we find that trade-related variables such as imports, exports, changes in monetary aggregates such M1, M2, and gross electricity production consistently figure among the best performing indicators for almost all horizons.
  - ■ At the shortest horizon of one month, the change or the real return on the ISE is the best predictor of IPI growth.

Results

- CPI
  - We find that trade related variables such as exports, imports or the unit value of imports and exports, and VAT revenue are among the best performing indicators.
  - This is true at the shortest horizon of one month as well as at longer horizons.

Conclusion

- We have presented a <u>systematic</u> approach to identifying leading indicators for real activity and inflation in Turkey over post 2000-2001 crisis period.

- Extensions of our approach consist of considering a two-stage approach that examines the median of the top five forecasts or combination forecasts based on all individual forecasts.

- In our analysis up to this point, we have only considered linear time series methods.