Research Working Papers

Recession Forecasting Using Bayesian Classification

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A new approach to recession forecasting outperforms competing methods up to 12 months in advance.

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We demonstrate the use of a Naïve Bayes model as a recession forecasting tool. The approach has a close connection to Markov-switching models and logistic regression but also important differences. In contrast to Markov-switching models, Naïve Bayes treats National Bureau of Economic Research business cycle turning points as data rather than hidden states to be inferred by the model. Although Naïve Bayes and logistic regression are asymptotically equivalent under certain distributional assumptions, the assumptions do not hold for business cycle data. As a result, Naïve Bayes has a larger asymptotic error rate, but converges to the error rate faster than logistic regression, resulting in more accurate recession forecasts with limited data. We show Naïve Bayes consistently outperforms logistic regression and the Survey of Professional Forecasters for real-time recession forecasting up to 12 months in advance. These results hold under standard error measures, and also under a novel measure that varies the penalty on false signals depending on when they occur within a cycle. A false signal in the middle of an expansion, for example, is penalized more heavily than one occurring close to a turning point.

JEL Classification: C11, C5, E32, E37

Additional Files

- Software Code and Data Supplement

Article Citations

- Davig, Troy, and Aaron Smalter Hall. "Recession Forecasting Using Bayesian Classification," Federal Reserve Bank of Kansas City working paper no. 16-06, August, available at https://doi.org/10.18651/RWP2016-06

Related Research

- Berge, Travis J., and Oscar Jorda. 2011. "Evaluating the Classification of Economic Activity into Recessions and Expansions." American Economic Journal: Macroeconomics vol. 3, no. 2, pp. 246-277.
- Chauvet, Marcelle, and James D. Hamilton. 2006. "Dating Business Cycle Turning Points," in Costas Milas, Phillip Rothman, and Dick van Dijk, eds., *Nonlinear Time Series Analysis of Business Cycles*. Amsterdam: North-Holland.
- Hamilton, James D. 2011. "Calling Recessions in Real Time," International Journal of Forecasting, vol. 27, no. 4, pp. 1006-1026.