

policy brief



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A Forecasting Mea Culpa – Maybe?

The performance of the Indiana Econometric Model in 2009

Michael Hicks, PhD

The preceding 18 months have offered economic forecasters an exercise in humility. From this experience should come an opportunity to improve the predictive capacity of forecasts. The first step in this is to carefully assess the recent forecast performance of these models. This policy brief reviews those forecasts.

In December, 2008 I released a State forecast for Indiana using the Indiana Econometric Model (IEM). This forecast included estimates of changes to total employment, personal income and major industry sector income for the four quarters of 2009. As of late October we have data on employment through 3rd Quarter 2009 and personal income through 2nd Quarter 2009. At this juncture an assessment of the performance of last December's forecast is warranted.

To explain the forecast performance, we first review the basic forecasting techniques, to understand the purpose of economic predictions and what, realistically economists should be able to explain about the future. This is followed with the particulars of Ball State University's forecast, after which we outline the results of the forecast and compare our projections to actual economic activity in 2009.

THE USES OF ECONOMIC FORECASTS

The primary use of economic forecasts of federal, state and local economic

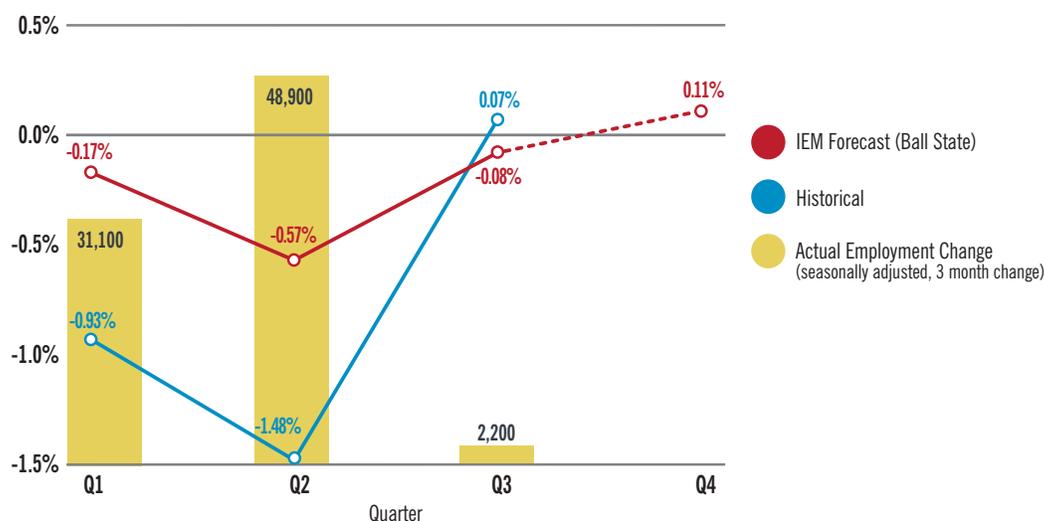
activity is to guide budgetary decisions by governments. A secondary use is often as a complement to business strategic decisions regarding investment in plant or equipment, employment and production of goods or services. Forecast accuracy is obviously important for both purposes, but it is widely recognized among economists that no forecast is truly right – though some might be helpful in informing the decisions for which they are formulated. A forecast is especially useful during budgetary deliberations as it may be used to set a baseline from which discussion regarding expenditures can depart. In this context, knowing historical accuracy of forecasts is critical in building budgetary reserves at the state and local level.

In addition to understanding the magnitude in the changes to economic activity, the timing of the business cycle as well as key economic variables is also a critical goal of the forecaster. Timing the turn in recessions in particular is among the most difficult tasks of an economist. For that reason, much time and effort is spent on developing econometric models to be used in predicting changes to the size and timing of economic activity.

FORECASTING MODELS

Economic forecasts are almost exclusively constructed by solving a series of simultaneous equations which represent different components of the economy. Data for these

Indiana Employment in 2009



equations are usually provided by Federal data collection efforts. The results from these computations range from startlingly complex models of several hundred equations to more tractable models that rely more heavily on observed history than theoretical relationships in the economy.

All economic models are calibrated on historical data. Thus, the relationship between particular economic variables (say interest rates and consumer spending) would be heavily influenced by the observed relationship between these variables over the preceding decades. While almost all models (including the IEM) permit some flexibility between these longstanding relationships, errors naturally tend to be greatest when the relationships vary most heavily. Very fast expansions and rapid recessions are thus two times when the models are sure to perform at their worst.

The Indiana Econometric Model, (constructed by Ball State University's Center for Economic and Business Research) is a hybrid model of the State's economy. The IEM uses a national model produced by Professor Ray Fair at Yale to provide an assessment of national economic performance. To these data are coupled a model which relies upon historical relationships between national and industry specific economic activity in Indiana to predict the economic performance a year ahead.ⁱ

i. For a more detailed explanation of the model see Hicks, Michael J. (2009) Forecasting State Level Economic Activity: An Error Correction Model with Exogenous National Structural Forecast Components Proceedings of the National Tax Association's 101st Annual Conference on Taxation, forthcoming.

THE INDIANA ECONOMETRIC MODEL PERFORMANCE IN 2009

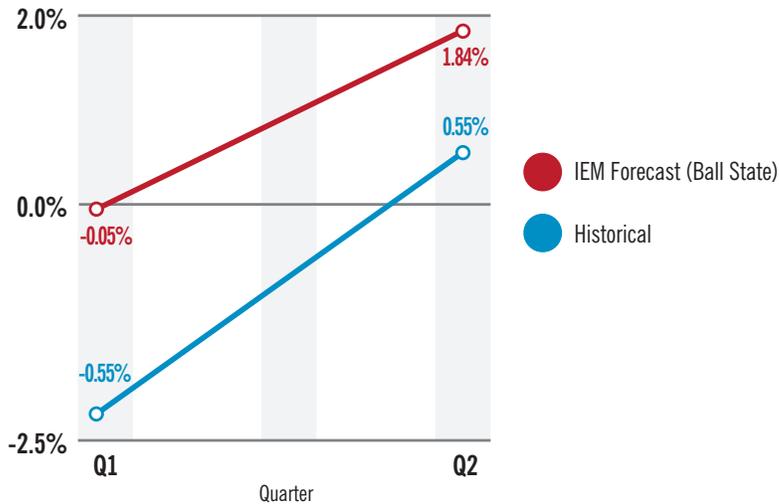
The performance of the Indiana Econometric Model in 2009 can now be determined by comparing actual total employment and income with that reported by the Bureau of Labor Statistics and Bureau of Economic Analysis respectively. As of late October, 2009 we have data on three quarters of employment and two of incomes.

The IEM predicted last December that employment would decline in Indiana over the first three quarters of 2009, rebounding modestly in the fourth quarter of this year. These declines in employment were predicted to accelerate through the first quarter through the end of June, 2009 moderating significantly by the end of 3rd quarter.

This forecast underestimated the magnitude of job losses in both 1st and 2nd quarters of this year, but missed the turn of employment to gains in the third quarter. The cumulative error of this forecast was 1.54% over 9 months.

This error, though large, is not outside the norm for 2009. In January, the Council of Economic advisors projected the path of the domestic economy as part of the explanation of the purpose of the fiscal stimulus legislation. They predicted unemployment rates with and without a stimulus roughly one month after this Indiana forecast. As

Personal Income in 2009



of the end of the 3rd quarter, their stimulus projections are roughly 2.8% beneath the actual level of job losses in the U.S.

Indiana University's center for Econometric Model Research provided an annual forecast for 2009 which concluded:

The jobs outlook for 2009 calls for shrinkage by about 50,000 jobs, and then turning back up near the end of the year. Average unemployment for the year should be in the 6.5 to 7.5 percent range.

—Conover, Jerry, *Outlook 2009*, Winter 2008, vol 83(4).

The non-seasonally adjusted unemployment rate for the first nine months of this year was 10.8, while total job losses (not seasonally adjusted) have been 98,367 since the end of December 2008. This error to date is roughly 1.6 percent of the total (see *Stats Indiana*). It is important to note that the timing of forecasts affects their accuracy. For example, the Indiana University Model was produced roughly one month prior to the Ball State University forecast (IEM), and roughly two months prior to that offered by the Council of Economic Advisors. Additional information which was available to the forecasters during this especially volatile period should have improved considerably the performance of their forecasts. Two other factors also bear on the relative comparison of forecasts. The Indiana Econometric Model

used seasonally adjusted data, while the Indiana University projections are compared to non-seasonally adjusted data because their forecast is aimed at annual numbers. As a consequence, the IU projections may be much closer to correct by year end as the full annual collection of data eliminates the need for seasonal adjustment. Though it is too early to make a truly systematic comparison of forecasts of Indiana's economy by these two centers, one matter is very clear at this point. *Armed with less information about the economy, our predictions were far closer to the economic conditions that have emerged than those produced by our counterparts at the U.S. Council of Economic Advisors.*

In addition to employment, the Indiana Econometric Model offered forecasts of personal income both in aggregate and at the industry level. As of this writing, two quarters of aggregate income are available for Indiana. Again the IEM erred in the magnitude of the changes to U.S. personal income, but did correctly predict the turning point in personal income in the state.

Finally, it should be noted that these data are subject to revision by the Bureau of Labor Statistics and the Bureau of Economic Analysis. Indeed, it would be surprising if some of the reported actual changes to employment in particular are not revised in the coming months.

The past year has seen significant efforts to improve forecasts of the Indiana economy. I presented the Indiana Econometric Model at the National Tax Association last fall and have made efforts to improve the model based upon comments at that venue of economists. I am not alone. Indiana University last month unveiled a series of leading economic indicators for Indiana. These data will likely prove an important tool in forecasting regional economic activity.

CONCLUSIONS

Citizens, business leaders and policy-makers rightly look to economists to help predict the future path of the economy. Accuracy in the magnitude and timing of these projections is important for effective decisions about matters surrounding personal and business finances and tax revenues and expenditures. Consumers of forecasts, both public and private, should ask questions about forecast performance, methodology and changes to forecasting tools that may influence the performance of forecasts.

This recession has been unusually difficult for economic forecasters. This policy brief is designed to review the performance of economic forecasts with an eye toward better understanding their use and limita-

tions. Economic forecasts are here to stay, and those of us who forecast the economy are likely to get better at these predictions with this experience. In the end however, an honest assessment of performance, however unpleasant, is the most effective path towards self improvement on the matter.

CENTER FOR BUSINESS AND ECONOMIC RESEARCH **POLICY BRIEF**

About the Center:

The Center for Business and Economic Research is a premier economic policy and forecasting research center housed within the Miller College of Business at Ball State University. The Center publishes the American Journal of Business—a peer-reviewed scholarly journal—and the Indiana Business Bulletin—a Web site with weekly commentary, analysis and data on economic, business and demographic trends in Indiana. Research in the Center encompasses health care, public finance, regional economics, transportation and energy sector studies. In addition to research, the Center hosts the Executive Economic Exchange in Indianapolis four times a year, and also serves as the forecasting element in the Muncie area—hosting five state and federal economic forecasting roundtables.

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