

Empirical Model Selection: Friedman and Schwartz Revisited

Neil R. Ericsson (Federal Reserve Board and George Washington University, USA)

Abstract

This paper examines two recent tools for empirical model selection: computer-automated general-to-specific model searches, and impulse indicator saturation. Computer-automated model searches can help obtain more robust empirical results than are feasible with manual model searches, while maintaining reasonable Type I errors. Impulse indicator saturation provides a highly general approach to testing parameter constancy; and it generates an estimator that is robust to outliers and thick-tailed distributions. After considering the theoretical properties of these tools, they are then applied to re-analyze previous modeling of UK money demand. Using annual data from Friedman and Schwartz (1982, Monetary Trends...), Hendry and Ericsson (1991, AER) developed an empirical model of the demand for broad money in the United Kingdom over 1878-1970. Model selection was a central issue in assessing the merits of Hendry and Ericsson's model, so this paper re-evaluates that model with Autometrics, a recent third-generation algorithm for computer-automated model selection. Hendry and Ericsson's model is remarkably robust to the model selection path, as characterized through variations in the algorithm's settings for target size, pre-search testing, fixity of regressors, indicator saturation, representation of the general model, and choice of dependent variable. This paper also assesses the empirical merits of Autometrics, using it to improve upon Hendry and Ericsson's (1991) model.

Modeling Compensation for US Production Workers: 1894-2008

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Abstract

Real wages for production workers in the United States have grown over 700 percent since 1890, and although a number of economic theories exist that explain such growth, no single empirical study has attempted to assess their relative importance. Limitations on data and estimation techniques, as well as major structural changes in labor markets, impede such an analysis. Using a series of total compensation for production workers covering over 100 years, this analysis employs recently-developed techniques in automatic modeling to test the impact on wage growth of twenty-one potential determinants, including classical measures, such as productivity and unemployment, as well as others, such as labor policies (minimum wage, social insurance), money supply, interest rates, and national debt. I find that the classical variables are the strongest determinants of wage growth, and a number of other factors have a milder effect. These include inflation, growth in money balances, interest rates, national debt, and the average value of the US stock market. Wages are also found to have a weak long-run relationship with productivity, taking about five years to return to equilibrium following a deviation from that relationship.

Model Selection in Mis-specified Equations with Breaks

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Abstract

Even modelling from a general initial specification can entail an under-specification of the economic data generation process, especially because of unmodelled breaks. This is a setting in which model selection, rather than just fitting a prior specification, can excel. In particular, impulse-indicator saturation (IIS) can 'correct' the non-constancies induced by location shifts in omitted variables. Such changes alter intercepts, but leave slope parameters unaltered, even when correlated with included variables, whereas location shifts in included variables induce changes in slopes when there are correlated omitted variables, even if their generation processes are constant. We show that IIS acts as a 'robust method' when models are mis-specified, and helps mitigate the adverse impacts of induced location shifts on non-constant intercepts, slopes and equation standard errors.

Jump Robust two Time Scale Covariance Estimation and Realized Volatility Budgets

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Abstract

We first propose a jump robust covariance estimator that is also robust to asynchronicity and microstructure noise. We then introduce the realized volatility budget for top down attribution of portfolio realized volatility into volatility components caused by each of the portfolio assets. These realized volatility budgets provide the portfolio manager insights into the portfolio risk concentration.

An Econometric Analysis of Contagion Amongst Stock Markets

Simona Boffelli (Bergamo University, Italy) and Giovanni Urga (Cass Business School, UK and Bergamo University, Italy)

Abstract

This work proposes to test for contagion via an Asymmetric Generalized Dynamic Conditional Correlation (AGDCC) assuming an Asymmetric Multivariate Laplace distribution (AML) of the innovations associated to the return series. Alternative specifications are available in the literature to test for contagion. The AGDCC-AML has the advantage of allowing series-specific news impact and conditional asymmetries in the dynamics of correlations, and of obtaining simultaneous estimates of conditional correlations for each pairs of countries analysed, without requesting the specification in advance of the starting date of the crisis. This widens the opportunities to look for evidence of contagion between pairs of countries and allows to conduct sensitivity analysis by changing the starting date of the crisis. We find evidence of presence of contagion to the rest of the world as consequence of the 2007-2008 US crisis: in 8 out of 9 industrialized countries, while in emerging countries there is evidence of contagion only in 4 out of 10 cases.

Econometric Modelling of Time Series with Outlying Observations

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Abstract

Economies are buffeted by natural shocks, wars, policy changes, and other unanticipated events. Observed data can be subject to substantial revisions. Consequently, a 'correct' theory can manifest serious mis-specification if just fitted to data ignoring its time-series characteristics. Modeling US expenditure on food, the simplest theory implementation fails to describe the evidence. Embedding that theory in a general framework with dynamics, outliers and structural breaks, using impulse-indicator saturation, the selected model performs well, despite commencing with more variables than observations, producing useful robust forecasts. Although this illustration involves a simple theory, the implications are generic and apply to sophisticated theories.

Analysis and Financial Implications of a Systemic Risk Indicator

Giorgio Consigli (University of Bergamo, Italy), Riccardo Pianeti (University of Bergamo, Italy) and Giovanni Urga (Cass Business School, UK and Bergamo University, Italy)

Abstract

The way in which the recent economic-financial crisis has evolved and spread out has drawn the attention of regulators and policy makers to the so-called systemic risk. Moving from the definition of systemic risk stated in the *G10 Report on Consolidation in the Financial Sector* (2001), we outline and implement a methodology for the construction of an indicator able to provide a quarterly measure of the global riskiness in the economic and financial system. By considering the period 1995-2009, we are able to appreciate the high capability of the relevant financial variables alongside the relevance of the indicator built. On the basis of the time

series of the indicator, we retraced the recent financial history. Finally, we propose an empirical analysis as regards to the relation between riskiness of the system and monetary policy in the United States and the Euro Area. Through a rigorous model selection approach, we find that expansionary monetary policies adopted by the FED in recent years were led also by riskiness of the system. On the contrary, there is evidence that ECB was more reluctant to give in to its role in maintaining price stability, even during the recent period of economic and financial instability.

Evolving Impacts of Oil Shocks

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Abstract

In an important study Killian [Not all oil price shocks are alike: disentangling demand and supply shocks in the crude oil market. *American Economic Review* 99(3), 1053-1069] suggests a structural model to disentangle the oil price shocks that are induced by oil-supply, global aggregate demand and oil-market specific precautionary demand; and argue that the impact of the shocks are different depending on their nature. To accommodate a possibility that the changes in the organization of oil market and macroeconomy's resilience to oil shocks we extend this work to allow for endogenously determined, unknown number of structural breaks. Using an iterative algorithm that searches between the possible breaks in the model's mean and covariance matrix we show: 1) the model parameters that are used to derive the shocks are not stable; 2) the impacts of these shocks on the U.S. economy are significantly different from those produced from his study once

Applying Shape and Phase Restrictions in Generalized Dynamic Categorical Models of the Business Cycle

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Abstract

The generalised dynamic categorical (GDC) permit multiple indexes enabling then to represent the NBER business cycle something that is not true of single index dynamic Probit models. To match the NBER business cycle features it is necessary to impose certain minimum phase duration and shape restrictions (monotonicity). Maximum likelihood and the constraint weighted bootstrapping estimator are developed to impose these restrictions. The estimators are then applied to the NBER business cycle data to obtain improved estimates of how the probability of recession varies with the yield spread.