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Sticky information and model uncertainty in survey data on inflation expectations

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Abstract

This paper compares three reduced-form models of heterogeneity in survey inflation expectations. On the one hand, we specify two models of forecasting inflation based on limited information flows of the type developed in Mankiw and Reis [2002. Sticky information versus sticky prices: a proposal to replace the new Keynesian Phillips curve. Quarterly Journal of Economics 117(4), 1295–1328]. We present maximum likelihood results that suggests a sticky information model with a time-varying distribution structure is consistent with the Michigan survey of inflation expectations. We also compare these 'sticky information' models to the endogenous model uncertainty approach in Branch [2004. The theory of rationally heterogeneous expectations: evidence from survey data on inflation expectations. Economic Journal 114, 497]. Non-parametric evidence suggests that models which allow the degree of heterogeneity to change over time provide a better fit of the data.

JEL classification: C53; C82; E31; D83; D84

Keywords: Heterogeneous expectations; Adaptive learning; Model uncertainty; Survey expectations

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1. Introduction

Despite the prominence of rational expectations in macroeconomics there is considerable interest in its limitations. Recent approaches impose bounded rationality at the primitive level; see, for example, Mankiw and Reis (2002), Ball et al. (2005), Reis (2004), Branch et al. (2004) and Sims (2003). Of these the sticky information model of Mankiw and Reis (2002) yields important (and tractable) implications for macroeconomic policy. Mankiw and Reis (2002) replace the staggered pricing model of Calvo (1983), which is employed extensively in Woodford (2003), with a model of staggered information flows. Each period, each firm, with a constant probability, updates its information set when optimally setting prices. The remaining firms are free to set prices also, but do not update their information from the previous period.

This paper has three objectives: first, to characterize sticky information in survey data in the sense that a proportion of agents do not update information each period; second, to test whether these proportions are static or dynamic; third, compare how well three competing reduced-form models of expectation formation fit the survey data. Carroll (2003) and Mankiw et al. (2003) provide indirect evidence of limited information flows in expectation formation. This paper elaborates on the nature of these flows in survey data. We also bridge the sticky information and heterogeneous expectations literature by presenting evidence of both model heterogeneity and limited information flows.

There is considerable interest in empirically inferring the methods with which agents form expectations. In particular, there is compelling evidence that survey expectations are heterogeneous and not rational. In an innovative paper, Mankiw et al. (2003) seek evidence of sticky information in survey data on inflation expectations. They examine surveys of professional forecasters and construct a data set based on the Michigan Survey of Consumers. Their results show that these survey data are inconsistent with either rational or adaptive expectations and may be consistent with a sticky information model. Bryan and Venkatu (2001a, b) document striking differences in survey expectations across demographic groups. Carroll (2003) provides evidence that the median response in the Survey of Consumers is a distributed lag of the median response from the Survey of Professional Forecasters. Branch (2004), adapting Brock and Hommes (1997), develops a methodology for assessing the forecasting models agents use in forming expectations. In that paper, evidence suggests survey responses are distributed heterogeneously across univariate and multivariate forecasting models. Brock and Durlauf (2004) argue that if agents are uncertain about the prevailing inflation regime then this uncertainty may manifest itself in agents switching between myopic and forward-looking predictors; hence, model uncertainty may be an aspect of expectation formation.[1]

[1]Other papers which show heterogeneity across forecasting models include Baak (1999), Chavas (2000), and Aadland (2004). Experimental evidence is provided by Heemeijer et al. (2004) and Hommes et al. (2005).