

# Expectations, Learning and Monetary Policy CEMLA webinar, April 2017

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The webinar reviews the literature on expectations formation and monetary policy with focus on bounded rationality and learning.

## **Books and survey papers on learning:**

Evans, G.W. and S. Honkapohja (2001), *Learning and Expectations in Macroeconomics*, Princeton University Press.

Below referred to as GE-SH book. The book has a web site that can be found at [www.uoregon.edu/~gevans/](http://www.uoregon.edu/~gevans/).

This site contains errata, problem sets and other supplements for the book.

The following are recent surveys and overviews of adaptive learning in macroeconomics:

Evans, G.W. and S. Honkapohja (2009), “Learning and Macroeconomics”, *Annual Reviews in Economics 2009*, vol.1, 421-449.

Below referred to as GE-SH survey (2009).

Evans, G.W. and S. Honkapohja (2013), “Learning as a Rational Foundation for Macroeconomics and Finance”, in Frydman, R and Phelps, E S (Eds.), *Rethinking Expectations: The Way Forward for Macroeconomics*. Princeton University Press, 2013, Chapter 2, 68-111.

Below referred to as GE-SH survey (2013).

Woodford, M., “Macroeconomic Analysis without the Rational Expectations Hypothesis,” *Annual Review of Economics*, Vol. 5, 2013.

Branch, W.A. and B. McGough (2016), “Heterogeneous Expectations and Micro-foundations in Macroeconomics,” draft Handbook chapter.

## Topics and reading:

### **I. Introduction to adaptive learning**

A. Basic notions in adaptive learning. Least squares learning in the cobweb market and Lucas’ natural rate models. Recursive algorithms and E-stability.

GE-SH book, chapters 1, 2, 4, 8. For technical background: chapter 6 and sections 7.3 and 7.4 (when reading focus on key concepts and main results.)  
GE-SH survey (2009), sections 2.1-2.3.

B. Heterogeneous expectations. Misspecification and learning.

GE-SH book, Chapters 3, 13, and section 15.6.

GE-SH survey (2009), section 2.4.

GE-SH survey (2013), section 2.2.2.

Honkapohja, S. and K. Mitra (2006), "Learning Stability in Economies with Heterogeneous Agents", *Review of Economic Dynamics*, 9, 284-309.

Hommes, C.H. and G. Sorger (1997), "Consistent Expectations Equilibria", *Macroeconomic Dynamics*, 2, 287-321.

Brock, W.A. and C. Hommes (1997), "A Rational Route to Randomness", *Econometrica*, 65, 1059-1095.

Branch, W.A. and G.W. Evans (2006), "Intrinsic Heterogeneity in Expectations Formation", *Journal of Economic Theory*, 127, 264-295.

C. Determinacy and learning stability in multivariate linear models.

GE-SH book, Chapter 10.

McCallum, B.T. (2007), "E-Stability vis-a-vis Determinacy Results for a Broad Class of Linear Rational Expectations Models", *Journal of Economic Dynamics and Control*, 31, 1376-1391.

## II. Learning and monetary policy

Determinacy and stability under learning of interest rate rules in the New Keynesian model. Implementation of optimal monetary policy.

A. Background on New Keynesian models.

Walsh, C.E. (2003), *Monetary Theory and Policy*, MIT Press, Sections 5.4.-5. and Chapter 11. (Read the rest of Chapter 5 as background.)

Clarida, R., J. Gali and M. Gertler (1999), "The Science of Monetary Policy: A New Keynesian Perspective", *Journal of Economic Literature*, 37, 1661-1707.

Gali, J. (2015), *Monetary Policy, Inflation and the Business Cycle, Second Edition*, Princeton University Press.

Woodford, M. (2003), *Interest and Prices, Foundations of a Theory of Monetary Policy*, Princeton University Press, especially Chapters 1, 3 and 4.

B. Overviews and Surveys

Evans, G.W. and S. Honkapohja (2003), "Adaptive Learning and Monetary Policy Design", *Journal of Money, Credit and Banking*, 36 (December, Part 2), 1045-1072.

Bullard, J.B. (2006), "The Learnability Criterion and Monetary Policy", *Federal Reserve Bank of St Louis Review*, 88, 203-217.

Evans, G.W. and S. Honkapohja (2007), "Expectations, Learning and Monetary Policy: An Overview of Recent Research", in *Monetary Policy under Uncertainty and Learning*, Eds. Schmidt-Hebbel, Klaus and Carl E. Walsh, Bank of Chile, Santiago, 2009, 27-76.

Gaspar, V., F. Smets and D. Vestin (2011), "Inflation Expectations, Adaptive Learning and Monetary Policy", in *Handbook of Monetary Economics 3B*, Eds. Fridman B. and M. Woodford, Elsevier, pp.1056-1095.

Eusepi, S. and B. Preston (2015), "The Science of Monetary Policy: An Imperfect Knowledge Perspective", mimeo.

### C. Basic theory.

#### (C.1) Learning and Taylor rules.

Bullard, J. and K. Mitra (2002), "Learning About Monetary Policy Rules", *Journal of Monetary Economics*, 49, 1105-1129.

Bullard, J. and K. Mitra (2007), "Determinacy, Learnability and Monetary Policy Inertia", *Journal of Money, Credit and Banking*, 39, 1177-1212.

#### (C.2) Learning and optimal monetary policy.

Evans, G.W. and S. Honkapohja (2003), "Expectations and the Stability Problem for Optimal Monetary Policies", *Review of Economic Studies*, 2003, 70, 807-824.

Evans, G.W. and S. Honkapohja (2006), "Monetary Policy, Expectations and Commitment", *Scandinavian Journal of Economics*, 108, 15-38.

#### (C.3) Nonfundamental equilibria. Long-horizon forecasts.

Honkapohja, S. and K. Mitra (2004), "Are Non-Fundamental Equilibria Learnable in Models of Monetary Policy?", *Journal of Monetary Economics*, 51, 1743-1770.

Evans, G.W. and B. McGough (2007), "Monetary Policy, Indeterminacy and Learning", *Journal of Economic Dynamics and Control*, 29, 1809-1840.

Preston, B. (2005), "Learning about Monetary Policy when Long-Horizon Forecasts Matter", *International Journal of Central Banking*, 1(2), 81-126.

Preston, B. (2006), “Adaptive Learning, Forecast-Based Instrument Rules and Monetary Policy”, *Journal of Monetary Economics*, 53, 507-535.

E-SH survey (2013), section 2.4.1.

(C.4) Other aspects: internal CB forecasting, speed of convergence

Honkapohja, S. and K. Mitra (2005), “Performance of Monetary Policy with Internal Central Bank Forecasting”, *Journal of Economic Dynamics and Control*, 29, 627-658.

Ferrero, G. (2007), “Monetary Policy, Learning and the Speed of Convergence,” *Journal of Economic Dynamics and Control*, 31, 3006-3041.

### III. Recent topics on Learning and Monetary Policy

#### A. Perpetual learning.

Orphanides, A. and J.C. Williams (2002), “Imperfect Knowledge, Inflation Expectations and Monetary Policy”, pp. 201-234 in Bernanke, B.S. and M. Woodford (eds.), *The Inflation Targeting Debate*, University of Chicago Press. Also Federal Reserve Board Discussion Paper Nr., 2002-27. Available at

<http://www.federalreserve.gov/pubs/feds/>.

Orphanides, A. and J. Williams (2007), “Robust Monetary Policy with Imperfect Knowledge,” *Journal of Monetary Economics*, 54, 1406-1435.

Milani, F. (2007), “Expectations, Learning and Macroeconomic Persistence”, *Journal of Monetary Economics*, 54, 2065-2082.

#### B. Liquidity traps.

Evans, G.W., Guse, E. and S. Honkapohja (2008), “Liquidity traps, learning and stagnation,” *European Economic Review* 52, 1438-1463.

Evans, G.W., Mitra, K. and S. Honkapohja (2016) "Expectations, Stagnation and Fiscal Policy," CEPR working paper 11428.

#### C. Other topics.

Evans, G.W. and B. McGough, (2016) “Interest Rate Pegs in New Keynesian Models”, mimeo.

Branch, W.A. and G.W. Evans, (2017), “Unstable Inflation Targets,” *Journal of Money, Credit and Banking*, in press.