Volume Title: NBER Macroeconomics Annual 2011, Volume 26

Volume Author/Editor: Daron Acemoglu and Michael Woodford, editors

Volume Publisher: University of Chicago Press

Volume ISBN: 978-0-226-00214-9 (cloth); 978-0-226-00216-3, 0-226-00216-0 (paper)

Volume URL: http://www.nber.org/books/acem11-1

Conference Date: April 8-9, 2011

Publication Date: August 2012

Chapter Title: Discussion of "Natural Expectations, Macroeconomic Dynamics, and Asset Pricing"

Chapter Author(s):

Chapter URL: http://www.nber.org/chapters/c12407

Chapter pages in book: (p. 72 - 75)

Discussion

Robert Hall opened the discussion by questioning whether the authors should target a high equity premium for their model given that the equity premium over the last fifty years has dropped to 1.6 percentage points. Hall also asked why the agents in the model would not try to approximate the income process with an ARIMA process with moderate p and q values, as Box and Jenkins (1970) would suggest for processes with lengthy AR representations. Andreas Fuster responded that the authors used some moderate p/q specifications, but these specifications did not greatly improve on the performance of simpler models.

Hall also highlighted the role of valuation ratios in investor decision making, but noted that agents in the model do not use any valuation measures for forming expectations. Finally, Hall emphasized the importance of thinking about the environment in which investment decisions take place, where intermediaries have strong incentives to aggressively market financial products and advice to investors who may be less informed.

Darrell Duffie suggested that a model with delayed adjustment of investors' expectations would generate features similar to the authors' model. Delayed adjustment of expectations might be optimal given an attention or information cost and would match data on the low frequency of portfolio adjustment. Moreover, delayed adjustment of expectations would generate higher risk premia for short-dated securities versus longer-dated securities consistent with empirical evidence on returns documented in Van Binsbergen and Koijen (2009).

Following on the discussion by Martin Eichenbaum, Olivier Blanchard noted that, because investors' decisions do not affect the income process, the welfare costs of natural expectations may be un-

978-0-226-00214-9/2012/2011-0104$10.00

derestimated. Blanchard also asked whether the bias in estimating a lower-order AR model (when the true model is a higher-order AR process) would necessarily go in one direction or the other. Fuster responded that the direction of bias is sample-specific. In theory, lower p models might have a downward or upward bias relative to the true higher p process.

Xavier Gabaix commented that the authors could cite results in behavioral finance to support their model of expectations formation. Gabaix noted that growth stocks command a premium to value stocks because investors tend to overestimate the persistence of earnings growth. On the welfare effects of natural expectations, Gabaix argued that providing the rational expectations agents access to a larger set of financial assets would magnify welfare effects by allowing these agents greater opportunities to exploit their informational advantage. Gabaix also responded to Eichenbaum's discussion that agents who do not know the true model might act more conservatively, citing evidence that people often ignore low probability events and respond to complexity by resorting to simple rules.

Reiterating Hall's comment, Albert Marcet asked about why agents do not use multivariate forecasting to estimate the income process. In particular, Marcet suggested that the use of the lagged price-dividend ratio may improve forecasts as a valuation measure. Marcet also disagreed with Gabaix's view that the introduction of additional assets would result in large gains for the agents with rational expectations. Marcet noted that the RE agents may still be constrained by incomplete asset markets or uncertainty.

Luigi Zingales asked about whether the long-term mean reversion observed in the dividend process is specific to the United States and whether this mean-reversion reflects a lack of disaster episodes. Like Gabaix, he suggested testing the model using returns for individual stocks given disaster episodes for companies in the form of bankruptcy.

James Kahn noted that Eichenbaum's welfare cost calculation did not include habit formation. He suggested that welfare costs may be larger if optimism leads to larger purchases, such as durable goods, and increase the disutility of the subsequent mean reversion in income.

Lars Hansen expressed concern that the authors' conclusions rely on the mean-reverting behavior of an AR process for income that may be overfit and urged the authors to try to incorporate this uncertainty in their calculations. Responding to Gabaix, he emphasized that a robustness approach does not preclude simple rules but simply recognizes

the importance of considering the utility consequences of selecting different models.

Frederic Mishkin agreed with Eichenbaum about the need to consider whether the marginal rational expectations investor could use leveraged positions to exploit any asset mispricing and whether this trading would affect prices. He encouraged the authors to further develop their extensions, with rational expectations agents trading with natural expectations agents.

Daron Acemoglu sought clarification on interpreting the welfare analysis by Eichenbaum. He noted that the model is not purely general equilibrium since the real interest rate is fixed but asset prices are determined endogenously. The Eichenbaum welfare calculation may underestimate the welfare effect given that the rational expectations agents would benefit from the prices set by the natural expectations agents. Acemoglu also proposed an alternative approach where agents hold heterogeneous priors over simpler models and then ask how strong these priors would have to be so that the data in the sample fails to reject their prior. Finally, Acemoglu pointed out that the authors' assumption of a fixed interest rate may have important consequences. In particular, if their model of expectations formation is used to explain bubble episodes, the rise in desired consumption would require high interest rates. However, available evidence suggests that bubble episodes are accompanied by lower real interest rates.

Eichenbaum responded to questions about the welfare calculation brought up during the discussion. He emphasized that he did not consider the effect of the introduction of rational expectations traders on the margin in his calculations. Acemoglu responded that these agents would benefit from the fact that prices were set by agents with natural expectations even if their actions had no effect on prices.

Benjamin Hebert addressed questions about how introducing rational expectations agents would affect their results. He noted that RE agents would not make unbounded profits since they still faced risk, but RE investors benefit from both the equity premium and timing the market in their trading. These agents follow a buy and hold strategy, and future work will consider how a sufficiently large mass of RE investors would affect prices.

David Laibson agreed with Hall's comment that the authors examined only a particular way in which investors make mistakes. He emphasized that their objective was to characterize a fairly large set of ways in which individuals make mistakes in forecasting and generate

testable predictions. Responding to Hansen and Evans, Laibson emphasized the inherent difficulty for investors to systematically address issues of model selection, robustness, and uncertainty. He acknowledged that the authors' assumption is that agents are overconfident and fail to fully address robustness concerns. Laibson closed the discussion by addressing the use of a fixed interest rate in their model. He noted that their results were unchanged with an endogenous interest rate because natural expectations agents perceive income to follow (nearly) a random walk. Therefore, the endogenous real interest rate is nearly constant.