

Feedback on the thesis by Mykola Babiak

Thesis Title: “Essays on Asset Pricing”

Overview

This thesis addresses three important aspects of financial markets; first, it investigates the term structure of risk in aggregate stock market and its implications for hedging and crash risk. Second, it investigates the amplification mechanism of macroeconomic shocks for the aggregate stock market due to structural uncertainty and learning dynamics, and third, the asset pricing implications of structural learning in a production-based asset pricing framework. All studies are based on the assumption that investors, or a representative agent for that matter, is only bounded rational since does not observe the complete set of parameters that drive the models. The results in all three papers show that the interplay between structural learning and uncertainty and the assumption of complex preferences for investors, such as generalized disappointment aversion, helps to rationalize some of the existing puzzles in asset pricing.

Assessment

The question of what drives the dynamics of risk and returns in financial markets, equity in particular, turns out to be crucial for both practitioners and academics. Departure from full-information rational expectations turns out to be an interesting venue to contribute to the explanation of both risk and returns dynamics. In this respect, this thesis makes a set of interesting contributions both from an applied theoretical perspective and from a pure empirical standpoint. All three papers are carefully executed and the results are quite convincing. I should commend the student for the detailed explanation of the models and the empirical analysis as well as for a careful discussion of the economic implications of the results. I believe the student can be admitted to defend his thesis and am confident he will be successful in doing so. There are only some minor comments which I think could be addressed, perhaps before the defense, which possibly could improve even further the thesis. I will give a detailed explanation of my comments below.

Comments on Paper 1

Conventional wisdom posits that investors are strongly willing to pay insurance to hedge long-term unexpected changes in risk, i.e., unexpected changes in the long-term variance. On the contrary, the empirical evidence shows that, in fact, is the short-end of the term structure of risk which carry most of the premium whereas long-term fluctuations are not really priced/hedged. This paper offers an alternative yet novel explanation based on a Generalized Disappointment Aversion (GDA) framework and time-varying uncertainty on macroeconomic fundamentals. In addition, the model proposed seem to be able to reconcile a number of well-know asset pricing puzzle such as the equity premium and the risk-free rate puzzle.

The mechanism provided is interesting, that is the interaction between learning and GDA preferences has not been fully investigated in the existing literature. In particular, the student explores a slightly different than usual form of learning, which is extrapolative expectations rather than the standard Bayesian posterior beliefs updating.

As far as the empirical design is concerned, the student compares the GDA preferences with two widely used restrictions, that is the standard Epstein-Zin (EZ) preferences and the Disappointment Aversion (DA) specification. Both of these alternative preferences seem to significantly underperform GDA.

What I think is missing though is a careful investigation of the learning implications. The student assumes an extrapolative expectations dynamics without fully investigating the performance of alternative, perhaps more established, learning dynamics as simple Bayesian beliefs. I appreciate the model matches quantitatively matches the unconditional moments as required, but still given the non-standard status of these expectations a full-blown comparison – very much in the spirit of the comparison with EZ and DA – should have been made. As a whole, except for few nuances I believe the first paper is fairly complete and ready for the defense, if not for journal submission already.

Comments on Paper 2

The second paper of the dissertation does not involve alternative, more exotic, preferences such as the first paper. However, the paper addresses an important question that has been recently introduced in empirical asset pricing that is how incomplete information in the structural parameters of the model dynamics amplifies the impact of macroeconomic shocks on equity prices. Interestingly, the student shows that rational parameter learning

endogenously generates long-run productivity and consumption risks that help explain a wide array of dynamic pricing phenomena. This is interesting for two main reasons: first, endogenous long-run risk through parameter learning, although not novel to the literature, it has not been studied before within a production-based asset pricing framework (first attempts have been made within more simplistic endowment economies). By using a production economy as a base framework the model is able to capture a variety of interesting features that cannot be captured otherwise, such as persistent components in productivity growth. Second, parameter learning in a production economy involves hard-to-implement numerical procedures which have far reaching implications for empirical asset pricing.

What needs to be clarified in this paper is what do the authors mean with “parameter learning”. At first, I thought it was really sequential learning about the structural parameters of the underlying process of economic growth, very much in the spirit of Collin-Dufresne et al. (2016). However, when I see at the empirical results it seems learning is about an underlying latent state, which falls into the standard labelling of beliefs updating. The two things have different implications; as a matter of fact, endogenous persistence raises from learning about a quantity that is fixed in the data generating process, such as a structural parameter, rather than by learning a time-varying latent state. I believe the authors need to clarify a bit what they mean with learning here and the consequential asset pricing implications. Other than that, I believe the paper is carefully executed and the results are quite convincing.

Comments on Paper 3

In the third paper the student shows that by incorporating time-varying productivity volatility and parameter uncertainty in a production economy one can explain index option prices, equity returns, the risk-free rate, and macroeconomic quantities. The interesting part is that the model can explain derivative features such as the implied volatility surface. The reason why I think this paper may represent an interesting contribution is that derivative prices naturally speak to investor perceptions of economic uncertainty and, therefore, offer an attractive opportunity to explore further links between asset prices and incomplete information. As for the second paper, the learning dynamics entails beliefs updating on latent states rather than the actual structural parameters that drive the data generating process. I find this a bit limiting but I also understand that the technology used to structural learning, i.e., sequential Monte Carlo algorithms, may be of rather difficult and complex implementation. As a result, to some extent the same concern

of Paper 2 applies here, that is the authors need to clarify a bit what they mean with learning here and the consequential asset pricing implications. The learning dynamics involves latent states rather than structural parameters such as transition probabilities, productivity growth rates, productivity volatility, leverage ratios, etc.