Comment

George-Marios Angeletos, MIT and NBER

I very much enjoyed reading—and discussing—the paper by Hassan and Mertens, not only because it is close to my research interests, but also because it makes an important step toward integrating the analysis of noisy asset markets in macroeconomic models.

The paper seeks to make two contributions. On the methodological front, it develops a tractable framework that puts together a large class of DSGE models with a noisy rational-expectations asset market in the tradition of Grossman and Stiglitz (1980) and Hellwig (1980). On the applied front, it makes a first attempt toward a quantitative evaluation of the macroeconomic effects of noisy asset markets within the baseline RBC model.

In this comment, I first explain the key modeling choices that drive the tractability in Hassan and Mertens’ framework, underscoring the value added but also some limitations. I then discuss the particular application considered in this paper and possible directions for future work.

Key Modeling Choices

Typically, introducing heterogeneous information in dynamic general equilibrium models, of either the macro or the asset-pricing type, comes together with two serious technical complications: (a) Kalman filtering, to deal with dynamic learning; and (b) infinite state spaces, to keep track of the hierarchy of beliefs (the “forecasting-the-forecasts-of-others” problem).

This paper does not offer a resolution to these complications. It only assumes them away, in order to make progress in a different direction.
More specifically, Hassan and Mertens assume that all information is perfectly revealed at the end of each period, so that the incompleteness and the heterogeneity of information persists only one period. This explains why the paper does not have to deal with the complications that, by contrast, recent quantitative work on incomplete-information models is struggling with.

In addition, the authors abstract from wealth heterogeneity. This is achieved by assuming that the privately informed investors, who take different positions in the asset market, are all members of the same “big family,” whose overall income is fully diversified against the idiosyncratic trading risk of each investor.¹

These simplifying assumptions, or variants of them, are familiar in the literature, but they are not enough for the purposes of this paper. Instead, Hassan and Mertens also reverse engineer the demand of the noise traders in such a way that they can guarantee that the information-aggregation and the signal-extraction problems in that market remain Gaussian, and highly manageable, despite the accommodation of rich preferences and rich dynamics in consumption and wealth.

This last step is far from trivial. I will not get into the details of this reverse engineering, but I want to highlight both the beauty and the ugliness of it. In Hellwig (1980), the demand of the noise traders is specified merely as a function of the price and an exogenous random shock. Here, by contrast, the demand of the noise traders must, in general, depend on other outcomes of the model, sometimes including the average belief of the informed traders. This dependence is needed for tractability, but has no appealing economic interpretation, causing a certain level of discomfort about the particular formulation proposed in this paper. Despite this, Hassan and Mertens must be commended for the ingenuity of their formulation and for the mastery with which they make sure that all the pieces of the framework hold together in a neat and useful manner. Furthermore, in a companion project, Hassan and Mertens propose an alternative—and, in my view, more appealing—formulation that replaces the noise traders with a certain form of imperfect rationality on the side of the informed traders.

The Methodological Contribution

The gain in terms of tractability and flexibility that Hassan and Mertens afford thanks to the aforementioned modeling choices is big. In a nutshell, they are able to embed a static Gaussian information-aggregation
problem à la Hellwig (1980) in a large class of representative-agent DSGE models.

Of course, the gain is not a free lunch. By ruling out dynamic learning, persistence in higher-order uncertainty, and wealth heterogeneity, the paper abstracts from important mechanisms that the existing literature has sought to explore. This includes higher-order belief dynamics and speculation in financial markets (e.g., Allen, Morris, and Postlewaite 1993; Sheinkman and Xiong 2001), inertia in the response of prices to monetary shocks (e.g., Woodford 2002; Mackowiak and Wiederholt 2009), and persistent business-cycle fluctuations due to noise or strategic uncertainty (e.g., Lorenzoni 2009; Angeletos, Collard, and Dellas 2014). In my view, this limits the broader applicability of the developed framework, as well as the quantitatively potential of the approach.

Despite these limitations, the framework that Hassan and Mertens develop remains, in my view, very useful because it accommodates important feedback effects between the noisy asset market and the macroeconomy—and this is where I see the key contribution of the paper.

On the one hand, the asset-market side of the model generates a noisy public signal about the underlying fundamentals (e.g., TFP), which enters the DSGE side of the model. In other words, the DSGE model features an endogenous type of “news” and “noise shocks.” This builds a useful bridge between the asset-pricing literature and the recent macroeconomics literature on expectation-driven business cycles.

On the other hand, the DSGE model determines the dynamics of interest rates, capital returns, wealth, and consumption, which in turn affect the risk-taking behavior of the investors in the asset market and thereby the precision of the price signal generated by this market. This can facilitate the analysis of how macroeconomic shocks and/or macroeconomic policy impact the aggregation of information in asset markets.

Applied Contribution

For the applied part of the paper, Hassan and Mertens focus on a version of the baseline RBC model, which is augmented through their method with a noisy asset market for the capital stock.

Following a plausible parameterization of the model, two sets of numerical results are provided, one regarding the model’s asset-pricing implications and another regarding the model’s business-cycle implications. On the asset-pricing side, the model is shown to deliver a rather modest equity premium and to fail to match empirical measures
of the cross-sectional dispersion in beliefs. On the business-cycle side, the model examines the dynamic response of key macroeconomic outcomes to innovations in the market signal and to shock in the demand of noise traders.

I think that this exercise offers a neat illustration of how the more general framework can be put at work, and therefore of the great potential of the methodological contribution of the paper. But if I focus exclusively on the particular applied lessons that this part delivers, I am not convinced about their added value.

Consider first the asset-pricing results. If one wants to gauge the quantitative importance of belief heterogeneity for asset markets, it seems imperative to allow for persistent belief differences, dynamic speculation, and endogenous wealth heterogeneity—but these are precisely the mechanisms that the paper abstracts from for the sake of tractability. Furthermore, I am not sure what the DSGE/macro side of the model adds: Would I lose anything, vis-à-vis the aforementioned asset-pricing results, if I were to recast the analysis in a static model, similar to Hellwig (1980), completely abstracting from the macrodynamics?

Consider next the business-cycle results. Here, I see two familiar mechanisms at work.

The first mechanism regards the role of the asset price as a noisy signal of future TFP. We already know from the existing literature on news and noise shocks what the macroeconomic effects of such noisy signals are within the baseline RBC framework, as well as within much richer DSGE models. Perhaps an interesting lesson could be obtained from studying counterfactuals that affect the endogenous precision of this signal, but such a lesson is currently missing.

The second mechanism regards the impact of noise traders on the resources of the economy: think of the noise traders as foreigners who consume part of the dividends/capital returns. It follows that the noise in the price signal is tied to an exogenous shock in resources. This is equivalent to an exogenous shock in (wasteful) government spending, the dynamic effects of which are well understood. Also, this mechanism does not appear to be relevant if the noise in the asset market originates, not from foreign traders, but rather from multiple forms of noise in the information of the domestic agents and/or by preference and liquidity shocks hitting these agents. This is one more reason why I prefer the alternative formulation that Hassan and Mertens pursue in companion research work, where they replace the noise traders with an appealing form of imperfect rationality for the information traders.
Conclusion

Hassan and Mertens have succeeded in developing a highly tractable theoretical framework for studying the aforementioned type of two-way feedback between noisy asset markets and the macroeconomy. Even though I was not convinced by the particular application they consider in this paper, I believe that such a framework is particularly useful if one wants to study how macroeconomic policy impacts the aggregation of information in asset markets.

For instance, suppose one wants to understand how monetary policy affects the informational role of asset markets and thereby equity premia and the component of business cycles that is driven by news and noise shocks. Clearly, this type of question requires a theoretical framework that merges the DSGE machinery with a noisy asset-market structure. This is precisely what Hassan and Mertens have provided us with, and this is where I see a significant potential.

Endnote

1. Think of this as follows: In the morning of each period, each of the investors leaves home, enters the asset market, receives private information, and makes their asset trades on the basis of this private information. Once the market closes, the investors return home, they pull their different stock market fortunes, and hence the family faces no idiosyncratic income risk.

References


