Response to Reviewers

July 5, 2019

The authors express thanks to the editors and reviewers for taking the time to review the manuscript, and for insightful comments and recommendations to strengthen the quality and readability of the manuscript. We have modified the manuscript to respond to concerns raised by the reviewers and have elaborated on the changes below.

Comments from, and Responses to Reviewer 1

Comments

1. *My concerns, primarily, are with regard to the modeling framework. First, in a vector autoregressive set-up, I think there is no reason to believe that ENSO is caused (in Granger sense) by macroeconomic variables or stock returns. So, it can be modeled as an exogenous variable (e.g., similar to the framework applied by Brunner (2002) that is referenced in the manuscript).*

2. *Second, in modeling the asymmetric impact of ENSO shocks, authors use a somewhat too simplistic approach. In particular, they split data into three subsamples, which is unconventional in time series applications. I would expect authors to apply some variant of a threshold VAR framework, which has become a go{to modeling technique for similar applications. But in that case, they should be aware that the usual impulse{response functions and forecast error variance decomposition will not longer be applicable. Alternative methods, that are suitable for regime{dependent nonlinear models, are available, of course.*

Response to Comments

Agreed. We have applied an alternative methodology that addresses the concerns of the reviewer.

1. The responses of U.S. food and agricultural stock returns to El Niño and La Niña shocks are estimated using state-dependent local projection methods (Jorda, 2005). With this method (and as recommended by the reviewer), ENSO shocks can be treated as exogenous with respect to the agricultural stock returns.

2. While this paper represents the first attempt to apply local projections to investigate asymmetries in the effects of ENSO, state-dependent local projection methods are now the state-of-the-art technique used in the macroeconomics literature to study, for instance, the asymmetric effects of fiscal policy shocks (see e.g. Auerbach and Gorodnichenko, 2012, 2013; Owyang et al., 2013; Ramey and Zubairy, 2018; Alpanda and Zubairy, 2018), monetary policy shocks (see e.g. Tenreyro and Thwaites, 2016; Jorda et al., 2019), and oil price shocks (Basher et al., 2012; Choi et al., 2018; Equiza-Goñi and Perez de Gracia, 2019).

Comments from, and Responses to Reviewer 2

This is a well-written paper on an interesting and important topic: the impact of ENSO on U.S. agricultural stock returns. The results are based on a statistical method that is essentially multiple regression.

In my opinion the paper will be suitable for publication after the issues below have been satisfactorily addressed.

Main Comment

- *I don't understand why the combined impact of El Nina, La Nina and neutral ENSO is investigated. We know that La Nina and El Nino have a different impact on e.g. rainfall. I suggest that these results are removed and the paper focuses on examination El Nino, La Nina and neutral separately, as you have done in section 5.*

Responses to Main Comment

1. Agreed. We have rewritten the paper to focus on the asymmetric impacts of El Nino and La Nina on agricultural stock returns using state-of-the-art local projections (Jorda, 2005) methods. These methods have been used in highly influential papers to study the asymmetric effects of fiscal policy shocks (see e.g. Auerbach and Gorodnichenko, 2012, 2013; Owyang et al., 2013; Ramey and Zubairy, 2018; Alpanda and Zubairy, 2018), monetary policy shocks (see e.g. Tenreyro and Thwaites, 2016; Jorda et al., 2019), and oil price shocks (Basher et al., 2012; Choi et al., 2018; Equiza-Goñi and Perez de Gracia, 2019).

Minor specific points

- *L3: weather pattern ... phenomenon*
  - **Response**: Corrected
- *First page: give references for key points made*
  - **Response**: Agreed. These references have been provided
- *Note: the impact of El Nino and La Nina on rainfall in southwest U.S. is asymmetric (Power et al., J Climate, 2006). Does this play a role in your results?*
  - **Response:** We have discussed how rainfall patterns are affected, and how these affect agricultural output, prices, and hence, stock returns
- *Repeated use of brackets on page 4 is distracting. State case without brackets, and then insert new sentence describing opposite case after this.*
  - **Response**: Agreed. We have stated the opposite cases without the brackets.
- *Page 4, 4th last line: VAR has already been defined.*
  - **Response**: Agreed. But we are no longer using a VAR.
- *Page 18. Use solid lines, not dashed lines.*
  - **Response:** We have used dashed lines to illuminate the differences between confidence intervals
- *SSTs in the equatorial Pacific are partially predictable. They are not "unanticipated". Clarify the specific meaning of this term in this context, or remove.*
  - **Response**: Agreed. this has been removed.
- *Give brief statement on extent to which the impacts of El Nino are opposite in sign to those for LN impacts.*
  - **Response**: Agreed. We have quantified the degree of asymmetry in figures 2 to 5 of the revised manuscript.