1. D_{it} is a not a measure of disasters but picks up any non-diffusion part of the return process

   - R1 asks how to distinguish between a process with many small jumps and a disaster
   - R1 points out that a set of paper show that option are well decribed by a pure jump process. *Trying to get on process of the stock price and not describe option dynamics*
   - R1: Lee and Mykland (2008) and Lee (2011) show that stock prices jump on earnings announcements and FED announcements $\Rightarrow$ such jumps may be priced in the options as opposed to disaster risk. This becomes more complicated if news arrival is clustered in time. *Should be possible to compare options at maturities that do and don't include such examples of jumps*
   - R4 is also worried about this.

   Comment: We can deal with this concern by estimating D_{it} for out of the money options (strike $< P_0 - 2\sigma$ for example) as opposed to whole the whole set of strikes.

2. Relate to and contrast with different explanations for similar implications of other models

   - R1: The result that p^* predicts macro variables don't support disaster model per se. The same predictive power can be generated in a production model with time-varying risk premia. *Can identify variables that change only during disasters and see if p_t^* predicts them*
   - R4: focus on one type of evidence to make a strong case that it is consistent with rare disasters and not other explanations

   Comment: These concerns should go away after we deal with the previous point

3. R4 suggests to put more emphasis on cross-sectional results: does the factor help to explain other anomalies, e.g Fama-French, Profitability, Asset Growth and others

   Comment: Will take this suggestion seriously after the main estimation

4. Study return predictablity based on p_t^* as a direct prediction of the model.

   - R1 points to Anderson, Fusari and Todorov (2015), Bollerslev, Todorov and Xu (forthcoming) and Bollerslev, Tauchen and Zhou (2009) as studying return predictability due to jump risk

   Comment: Not a big deal, easy to include results after the main estimation.

5. R1 points that if the return process has both common and idiosyncratic components, then even if idiosyncratic jumps are uncorrelated, averaging of D_{it} across i picks up both the probability of a common jump and something like cross-sectional variance of idiosyncratic components.

   - R2 on the other side says that the fact that p_t^* is the same across stocks is obvious and suggests to put less emphasis on theory behind it

   Comment: Emil thinks that this is not very relevant. To alleviate concerns we can simulate returns with both aggregate and idiosyncratic jump components and show that idiosyncratic component doesn't affect the results.

6. Suggest to start from index options

   - R3: Can compute the entire risk-neutral distribution from index options given sufficient number of strike prices. Probably provides a more accurate measure of disaster risk

- R4: if all stocks jump simultaneously index options should be sufficient. If these is a systematic component why the correlation between the factor and an index jump risk is as small as 69%.

Comment: Can provide these results as well, not a big problem once we deal with the estimation.

7. Related papers

   - R2: Christoffersen, Fournier and Jacobs (R&R in RFS) that does a similar exercise.
   - R2: since p_t^* is very correlated with VIX worry about the relation with Ang, Hodrick, Xing and Zhang (JF, 2006)
   - R3: Cremers et al. (JF, 2015)
   - R1 points to Gao and Song (2015) that studies the same D_{it} but uses it directly to explain differences in returns as opposed to constructing portfolios. **Comment:** Using measure D_{it} directly results in too few observations because not so many stocks have liquid options.
   - R4: Why is Du and Kapadia (2013) method better than Bollerslev, Todorov and Xu variance premium and Kelley and Jiang extreme stock returns (*I think both of these develop an ex post measure*)

   Comment: The majority of these papers develops new approaches to estimate jump component and of course all of them are correlated. However, we are inherently interested in what can we learn from the resulting measure in terms of time series: does p_t^* move too much and in cross section: is the exposure to p_t^* priced in the cross section.

8. Clarification of the model and the estimation process

   - R1: is PCA conducted on a balanced panel? Are variables standardized before doing PCA? *I think in PCA you always standardize the variables*
   - R3 asks for a less obscure model to see the direct effect of rare disasters as opposed to something else.
   - R4 asks for clarification on Du and Kapadia (2013) method: why does it work intuitively and measures what the paper wants to measure. What are the assumptions behind this method?

9. Numbers

   - R2: Surprised that the first PC is less than 50%
   - R2: Annualized AR(1) is only 30% which is not very persistent. **Comment:** this may be good if we want to argue that p_t^* moves too much. Can also look at the turnover in the sorted portfolios to make the same point.
   - R3: relate 50% of the first PC to some benchmark to get some idea about relative magnitudes.