who do not regularly trade, therefore these traders are not explicitly reflected in our model. Theta is set to 0.25 for all traders.

4 Analysis

Experiments
In the following section, we describe our controlled experiments to investigate the impact of heterogeneous decision cycles on market stability. In the first experiment, we vary σ to investigate the impact of heterogeneous order sizes and rates, which are attributes of classes of traders (i.e., short-term liquidity takers, short-term liquidity providers and long-term liquidity providers). In the second experiment, we vary the firms' perception of the asset's fundamental value, which may be an attribute of the individual firm. In our last experiment, we vary σ as well as introduce an exogenous, liquidity shock to investigate the effect of heterogeneous decision cycles during market crises. Together, these experiments demonstrate the ability to investigate dynamics at three levels: individual traders, classes of traders, and the market level where liquidity accumulates and prices emerge.

All of the experiments which are analyzed in this section are tested on the sample of 36 design points described above, each of which passed the relaxed stylized facts in at least 90% of the replicates.

As before, we first varied the value of σ, across five values: 1, 5, 10, 25, and 50. Figure 8 illustrates the stability of the stylized facts across various values of σ, where pass rate is calculated according to our stricter standard test.

We focused on the average minimum price over a set of simulations in a given experiment. That is, for each run of the experiment, we looked at the lowest price after the price shock occurs, i.e., the trough of the resulting market event, and averaged this across all of the runs. Depicting experiments for two design points with results representative of the remaining design points, Figure 9 shows σ has large effects on the average minimum price; the average minimum price is lower as we increase σ, though its effects start to dampen as it reaches values of 25 and 50. It is also apparent that in the worst-case scenarios, the value of σ has major effects on minimum price, but when the median of the minimum price is taken across all random seeds, the effects are almost negligible. This highlights an important aspect for financial markets, and complex systems in general, which is that in any fat-tailed distribution, the mean and median are not sufficiently reliable statistics to give accurate insight into the behavior of a system. From Figure 8, we note that the average kurtosis does not increase significantly as σ increases, even though the range of minimum prices does increase. This is significant because as we have hypothesized, the effect of σ on average minimum price is not due to qualitatively different sizes of individual negative returns (i.e., larger, individual price drops) but due to the inability of short-term liquidity providers to meet the immediate needs of short-term liquidity takers between the arrival of long-term, liquidity providers.