Individual Investor Perceptions and Behavior During The Financial Crisis

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How individual investor perceptions change and drive trading and risk-taking behavior during the 2008–2009 financial crisis?

Swings in trading and risk-taking behavior that are driven by changes in investor perception.

Objectives and Motivation of the study

-measure individual investors' perceptions in a survey on their expectations for stock-market returns
-measure individual investors' perceptions in a survey on their expectations for their risk tolerance
- measure individual investors' perceptions in a survey on their expectations for their risk perceptions.

H_1: The financial crisis depressed individual investors' perceptions. That is, their return expectations and risk tolerance decreased, while their risk perceptions increased.

H_2: The financial crisis made investors aware of a higher than expected investment risk. In response, individual investors reduced their portfolio risk.

H_{3a}: The frequent arrival of information during the financial crisis led to information overload. As a result, individual investors reduced their trading activity.

H_{3b}: The frequent arrival of information during the financial crisis changed investor perceptions and created a larger divergence in their perceptions. As such , have more reasons as well as opportunities to trade increased individual investors trading activity.

Data Used

The available data provide a relatively complete coverage of the crisis's impact on the stock markets.

Figures 1 and 2 show the evolution of investors' return expectations, risk tolerance, and risk perceptions during the crisis, as well as the Dutch stock market's index returns (AEX).

Figure 1. Return Expectations. Return expectations are measured on a 7-point Likert scale (see Table 3); shown is the sample mean. A small value indicates low return expectations, whereas a large value indicates high return expectations. AEX return is the total return of the Dutch stock market index.

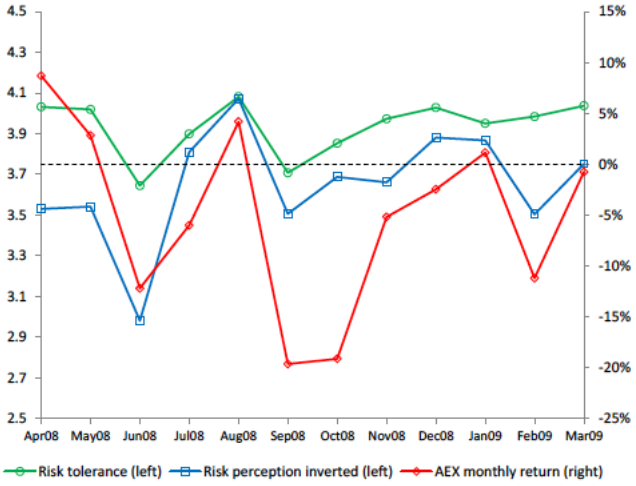

Figure 2. Risk Tolerance and Risk Perception. Risk tolerance and risk perception about investment prospects are measured on a 7-point Likert scale (see Table 3); shown is the sample mean. For illustrative purposes, risk perception is shown on an inverted scale. A small value indicates low risk tolerance or high perceived risk, whereas a large value indicates high risk tolerance or low perceived risk. AEX return is the total return of the Dutch stock market index.

Table 4
Univariate Tests

Panel A: Differences in Means between Month Pairs

	Mar-09 vs. Apr-08	May-08 vs. Apr-08	Jun-08 vs. May-08	Jul-08 vs. Jun-08	Aug-08 vs. Jul-08	Sep-08 vs. Aug-08	Oct-08 vs. Sep-08	Nov-08 vs. Oct-08	Dec-08 vs. Nov-08	Jan-09 vs. Dec-08	Feb-09 vs. Jan-09	Mar-09 vs. Feb-09
Return Expectation	0.01	-0.13 ***	-0.55 ***	0.26 ***	0.34 ***	-0.74 ***	-0.13 **	0.33 ***	0.20 ***	0.20 ***	-0.53 ***	0.75 ***
Risk Tolerance	0.01	-0.01	-0.37 ***	0.25 ***	0.18 ***	-0.37 ***	0.15 *	0.12	0.06	-0.08	0.03	0.05
Risk Perception	-0.22 **	-0.01	0.56 ***	-0.83 ***	-0.26 ***	0.57 ***	-0.18 **	0.03	-0.22 **	0.01	0.36 ***	-0.25 **
Portfolio Volatility	0.16 ***	-0.01	0.05 ***	0.05 ***	-0.05 ***	0.14 ***	0.21 ***	-0.18 ***	-0.09 ***	0.01	-0.05 ***	0.07 ***
Account Volatility	0.09 ***	-0.01 **	0.02 ***	0.02 ***	-0.02 ***	0.09 ***	0.12 ***	-0.10 ***	-0.06 ***	0.01 **	-0.03 ***	0.04 ***
Buy-Sell Ratio (Traders)	0.16 ***	-0.03	0.10 ***	0.17 ***	-0.11 ***	0.11 ***	0.06 *	-0.13 ***	-0.13 ***	0.06	0.03	0.03
Turnover (Traders)	0.35	-0.22 **	0.06	0.08	-0.21 *	0.14	0.60 **	-0.23	-0.39 *	0.09	0.14	0.30
Fraction Traded	-0.07 **	0.02	0.01	-0.03	-0.06 **	0.08 **	0.10 ***	-0.18 ***	-0.03	0.05	0.01	-0.04
Volume € (Traders)	-28,599	-31,448 **	7,007	-4,374	-4,811	5,738	27,268	-25,088	-7,568	12,811	-4,493	-3,641

Panel B: Differences in Means between Months and Total Sample Period

	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09
Return Expectation	0.43 ***	0.30 ***	-0.24 ***	0.01	0.35 ***	-0.38 ***	-0.51 ***	-0.18 ***	0.01	0.21 ***	-0.31 ***	0.44 ***
Risk Tolerance	0.11 **	0.10 **	-0.27 ***	-0.02	0.16 ***	-0.21 ***	-0.06	0.06	0.11	0.03	0.07	0.12 *
Risk Perception	0.08	0.07	0.63 ***	-0.20 ***	-0.46 ***	0.10	-0.08	-0.05	-0.27 ***	-0.26 ***	0.10	-0.14 *
Portfolio Volatility	-0.12 ***	-0.13 ***	-0.09 ***	-0.03 ***	-0.08 ***	0.05 ***	0.27 ***	0.09 ***	0.00	0.01	-0.04 ***	0.04 ***
Account Volatility	-0.07 ***	-0.08 ***	-0.06 ***	-0.03 ***	-0.06 ***	0.03 ***	0.15 ***	0.06 ***	0.00	0.01 **	-0.02 ***	0.02 ***
Buy-Sell Ratio (Traders)	-0.13 ***	-0.17 ***	-0.07 **	0.11 ***	-0.01	0.10 ***	0.16 ***	0.03	-0.10 ***	-0.03	0.00	0.03
Turnover (Traders)	0.00	-0.22 *	-0.16	-0.08	-0.29 **	-0.15	0.45 ***	0.21	-0.18	-0.09	0.05	0.35 *
Fraction Traded	0.00	0.02	0.03	0.00	-0.06 **	0.02	0.12 ***	-0.06 **	-0.09 ***	-0.04	-0.03	-0.07 **
Volume € (Traders)	20,750 **	-10,698	-3,691	-8,065	-12,876	-7,138	20,130 *	-4,958	-12,526	285	-4,208	-7,849

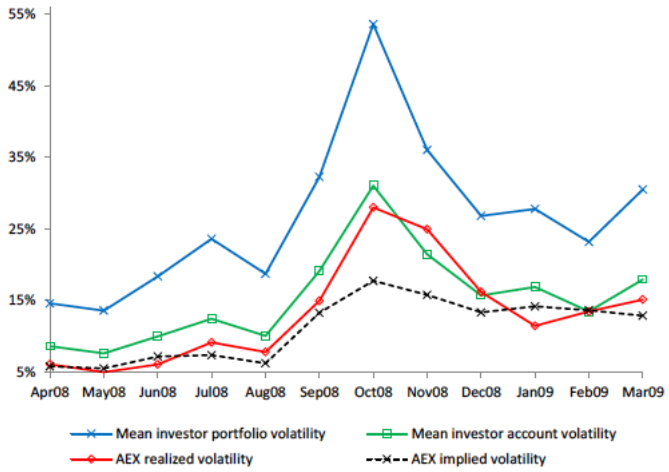

Figure 3. Investors' Monthly Return Volatility. AEX realized volatility is calculated for each month based on the daily total returns of the AEX index. The implied AEX volatility is given by the VAEX volatility index. Statistics refer to the respondent sample. All volatilities are depicted in monthly terms. Variables are defined in Table 1.

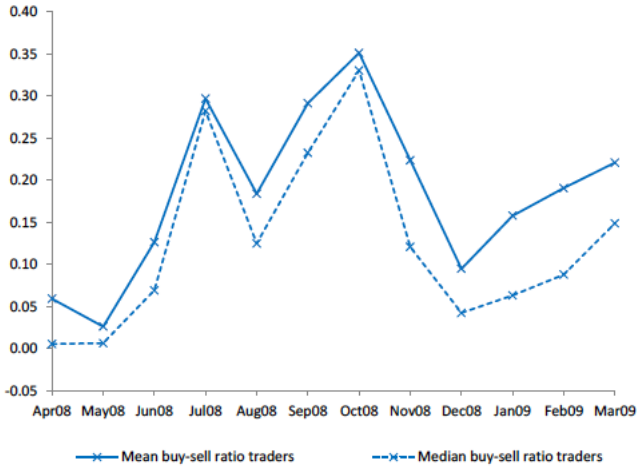

Figure 4. Investors' Buy-Sell Ratio (Traders). AEX return is the total return of the Dutch stock market index. Statistics refer to the respondent sample. Variables are defined in Table 1.

H3a: The frequent arrival of information during the financial crisis led to information overload. As a result, individual investors reduced their trading activity.

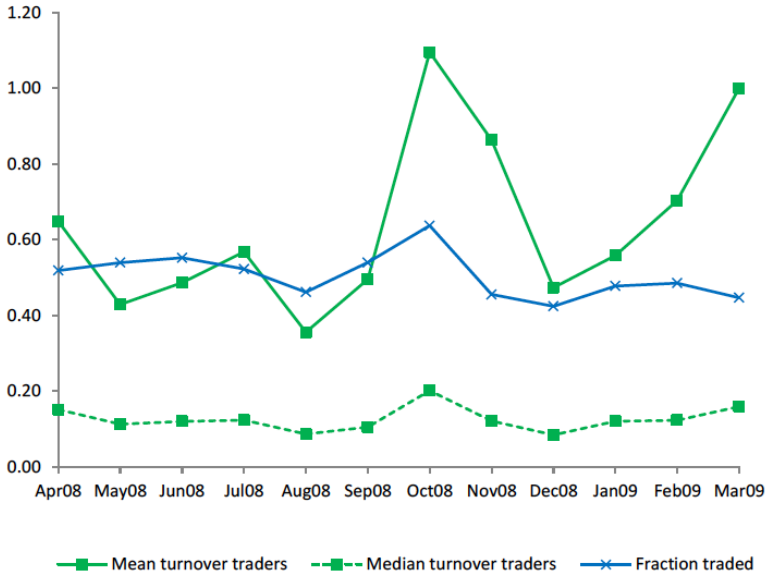

Figure 5. Trading Activity – Fraction of Investors that Traded and Turnover. Statistics refer to the respondent sample. Variables are defined in Table 1.

H3b: The frequent arrival of information during the financial crisis changed investor perceptions and created a larger divergence in their perceptions. As such , have more reasons as well as opportunities to trade increased individual investors trading activity.

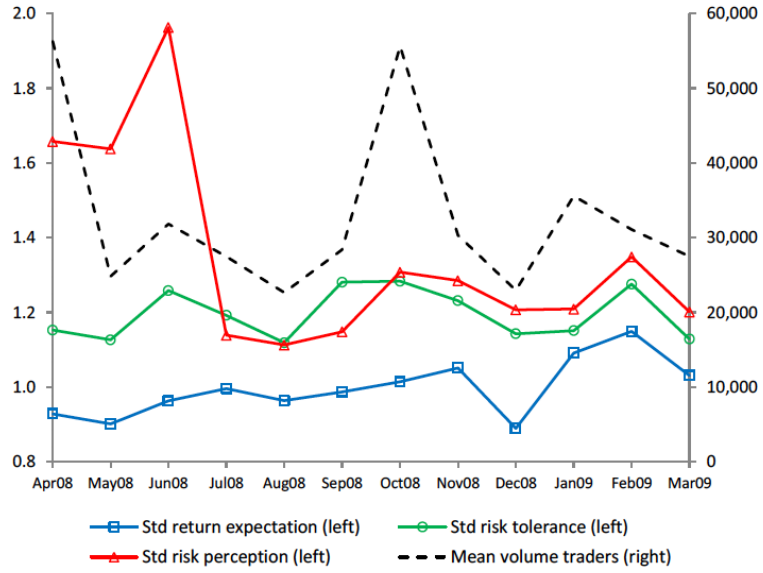

Figure 6. Divergence of Perceptions and Trading Volume. Shown are the monthly cross-sectional standard deviations of return expectation, risk tolerance, and risk perception, as well as the mean of the monthly volume (buy + sell) per investor. Statistics refer to the respondent sample. Variables are defined in Table 1.

Indicators , Methods , Models used

Return expectation reflect the extent to which a respondent is optimistic about her investment returns .

Risk tolerance reflects a respondents predisposition toward financial risk .

Risk perception reflects a respondent's interpretation of the riskiness of the stock market.

Return expectations of stock-market returns, risk tolerance, and risk perceptions $\Rightarrow$ qualitative measures.

Measure are reliable and tested with the Cronbach's Alphas wich indicates the degree of interrelatedness between a set of items that together measure a particular variable and is expressed as a number between 0 and 1 .

Our measurement of return expectations, risk tolerance, and risk perception is reliable, as Cronbach's alpha varies between 0.71 and 0.89 for these variables

[5] Cronbach's alpha is calculated as:

$$\alpha = \frac{k}{k-1}\left(\frac{\sum_{i=1}^{k}\sum_{\substack{j=1\\ i\neq j}}^{k}\mathrm{Cov}\,(x_i x_j)}{\sum_{i=1}^{k}\sum_{\substack{j=1\\ i\neq j}}^{k}\mathrm{Cov}\,(x_i x_j)+\sum_{i=1}^{k}\mathrm{Var}\,(x_i)}\right)=\frac{k}{k-1}\left(\frac{\sum_{i=1}^{k}\sum_{\substack{j=1\\ i\neq j}}^{k}\sigma_{ij}}{\sum_{i=1}^{k}\sum_{\substack{j=1\\ i\neq j}}^{k}\sigma_{ij}+\sum_{i=1}^{k}\sigma_i^2}\right)$$

, where α is Cronbach's alpha, x_i is measurement for item i, and k is the number of items

H2: To measure portfolio risk, we use the volatility (standard deviation) of investors' daily portfolio returns

H3a: we regress 17 investors' trading activity on their perceptions and variables that previous research showed to be linked to susceptibility to information overload.
In particular, Agnew and Skykman find that financially literate and experienced investors, that is, those with longer account tenure , higher income and larger portfolio values , suffer less from information overload .These investors typically have less difficulty interpreting the frequent and sometimes conflicting information that arrives during a crisis. Therefore , we expect them to have a lower tendency to be overwhelmed by crisis events that could have led them to refrain from trading .If information overload is present , trading activity should be poitively related to variables that proxy for financial literacy and experience , such as account tenure income and portfolio value. To examine this notion, we estimate two regression models explaining investors likelihood of trading and turnover.

H3b: increase in trading activity, as observed in Figure 5.
Figures 1 and 2 and Table 4 show that perceptions fluctuate significantly during the crisis. Together with the regression results, this suggests that having more reasons to trade leads investors to increase their trading activity.
To measure divergence of perceptions (i.e., disagreement between different investors), we use the monthly cross-sectional standard deviation of the perception measures

Results

H1: Figure 1 & 2: During the financial crisis, investor perceptions become depressed when the stock market does badly. That is, return expectations and risk tolerance decrease, while at the same time, risk perceptions increase. However, the depressing effect of the crisis on investors' return expectations, risk tolerance, and risk perceptions is temporarily as these variables recover with improving market returns. In fact, a comparison of investor perceptions from the beginning of the sample period to the end of the sample period shows that individual investors perceive less risk after the crisis than before the crisis, while there are no significant changes in their return expectations and risk tolerance

H2: Figure 3: Thus, during the height of the crisis, investors are not de-risking their portfolios. Towards the end of the crisis, return volatility is even higher than at the beginning of the crisis .Considering that individual investors are generally not well diversified and hold only a limited number of different securities in their portfolios, it might be difficult to reduce risk by changing portfolio compositions. individual investors used the depressed asset prices as a chance to enter the market. individual investors, on average, increase their buying volume after price decreases (and vice-versa).

The results lead us to reject hypothesis H_2. The financial crisis did not induce individual investors to de-risk their portfolios. This behavior is rooted in the time-variation of investor perceptions: risk tolerance quickly returns to pre-crisis levels while risk perception levels are even lower at the end of the sample period than at the beginning of the sample period. As these measures are key drivers of portfolio risk and buy-sell ratios, investors did not de-risk.

H3a: Income is significantly and positively related to the likelihood to trade (consistent with an information overload effect), but is not significantly related to turnover. Account tenure is negatively associated with the likelihood to trade (not consistent with an information overload effect), but is positively related with turnover (consistent with an information overload effect). We find opposite results for the portfolio value coefficients.

We do not find evidence in support of hypothesis H_{3a}.

H3b: Figure 6 plots the divergence of investor perceptions during the crisis. Divergence of perceptions tends to move similarly as trading volume in most months. **That is, in months in which volume increases (June, September, August, however, not January), divergence of perceptions also increases significantly** .Overall, we thus find support for H_{3b} but reject H_{3a}: the increased trading activity during the height of the crisis is related to changes in perceptions as well as higher divergence of perceptions. In other words, the crisis provided individual investors with more reasons as well as more opportunities to trade.

Conclusion :

We combine monthly survey data with matching brokerage records and show how individual investor perceptions change and drive trading and risk-taking behavior during the 2008–2009 financial crisis. **Investor perceptions exhibit significant fluctuation over the course of the crisis, with risk tolerance and risk perceptions being less volatile than return expectations. In the worst months of the crisis, investors' return expectations and risk tolerance decrease, while their risk perceptions increase. Towards the end of the crisis, return expectations, risk tolerance, and risk perceptions recover**. We find substantial swings in trading and risk-taking behavior during the crisis that are driven by changes in investor perceptions. Contrary to popular beliefs and expectations from prior literature, however, **individual investors continue to trade and do not de-risk their investment portfolios during the crisis. Individual investors also do not try to reduce risk by shifting from risky investments to cash. Instead, individual investors use the depressed asset prices as a chance to enter the stock market.**