An Empirical Investigation of Herding Behavior in the U.S. and the Eurozone

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- Furthermore, we provide evidence that the cross-sectional dispersion of returns of the domestic equity market can be partly explained by the corresponding dispersions of the financial sector and its industries, with the latter having influence on the herding of the domestic equity market.
- We extend this analysis to the last two main crises, introducing new evidences of "spurious" and "intentional" herding activity, suggesting that different crises may affect herding behavior in different ways.

Motivation I

- Policymakers and supervisory authorities are interested in identifying correlated patterns of trades that may aggravate returns' volatility, eroding the financial stability (Demirer et al., 2010).
- A large body of research covered herding effects in several stock markets.
  - Christie and Huang (1995) examined twelve US industries,Gleason et al. (2004) use intra-day data to examine herding on nine S&P500 sectors of Exchange Traded Funds during periods of market's extreme movements.
  - Chang et al. (2000) analyzed US, Hong Kong, Japan, South Korea, and Taiwan.
  - comprehensive analysis of herding in Chinese stock markets (see, Demirer and Kutan, 2006; Tan et al., 2008; Chiang et al., 2010).
  - cross-country herding effects: Chiang and Zheng (2010), herding within eighteen countries, advanced markets (seven), Latin American markets (four) and Asian markets (seven);Economou et al. (2011) provide evidence of cross-country herding for four South European markets, while Mobarek et al. (2014) enlarged the sample under analysis to eleven developed European markets.

Motivation II

- Galariotis et al. (2015) report evidence of herding for US investors when fundamental macroeconomic announcements are released and spillover herding effects from the US to the UK markets. Moreover, they examine the presence of "spurious" and "intentional" herding in these two markets. Lastly, Galariotis et al. (2016) provide new evidence on the relation between herding behavior and equity market's liquidity for the G5 markets, namely US, France, Germany, UK and Japan.

- Overall, emerging markets tend to herd more likely than developed markets.
- Our motivation to study the presence of herding in the Eurozone at aggregate level, rather than considering "stand-alone countries", is that herding threatens the financial stability of the Eurozone, and therefore all the Eurozone markets would experience extreme tail conditions that would call upon the European Central Bank (ECB) intervention.
- We also consider herding under market asymmetry conditions, providing evidence of herding in case of higher/lower volatility, credit deterioration, funding illiquidity, and economic policy uncertainty.

Motivation III

- We analyze the presence of "spurious" and "intentional" herding in the US and Eurozone markets and financial industries during the entire sample period and the last two main crises.

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- EZC covers the period from the 2^{nd} of May 2010, the first bailout package of the International Monetary Fund (IMF) for Greece, to the 31^{th} of December 2012, the month in which the Greek government bought-back EUR 21 billion of their bonds

Measuring Herding

- There are two main types of measures of herding behavior at this moment in time:
  1. based on cross-sectional data on stock returns (Christie and Huang, 1995; Chang et al., 2000; Hwang and Salmon, 2004)
  2. spanned by measures constructed on transaction data (Lakonishok et al., 1992; Wermers, 1999; Welch, 2000).
- Christie and Huang (1995) developed the following regression to test for herding: $CSSD_t = \alpha + \beta^L D_t^L + \beta^U D_t^U + e_t$; where

$$CSSD_t = \sqrt{\frac{\sum_{i=1}^{N}(R_{i,t} - R_{m,t})^2}{N-1}}$$

  and D_t^L (D_t^U) is a dummy variable that takes the value 1 if the market return at time t lies in the extreme lower (upper) tail of the distribution, and 0 otherwise
- Christie and Huang (1995) can only be used to analyse herding effects during period of market distress. It does not allow to model herding during tranquil periods of the market (Hwang and Salmon, 2004).

- We use the CSAD herding measure introduced by Chang et al. (2000),

$$\boxed{CSAD_t = \frac{1}{N}\sum_{i=1}^{N}|R_{i,t} - R_{m,t}|} \tag{1}$$

where $R_{i,t}$ is the company i return at time t, $R_{m,t}$ is the cross-sectional average return of all N companies at time t.

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- Chang et al. (2000) define the non-linear relationship between return dispersions and the market return as follows:

$$\boxed{CSAD_t = \alpha + \gamma_1|R_{m,t}| + \gamma_2 R_{m,t}^2 + e_t} \quad (2)$$

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$$CSAD_t = \alpha + \gamma_1 |R_{m,t}| + \gamma_2 R^2_{m,t} + e_t \quad (2)$$

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- The non-linear term ($R^2_{m,t}$) is introduced to capture the herding effect
- We employ the regression model (2) for each market to test for herding behavior, indicated by a γ_2 negative and statistically significant.

Testing for Herding During Crises

- We examine whether or not the herding effects are more pronounced during the last two main financial crises, namely the GFC and the EZC.
- We augment the Eq. (2) with a dummy variable D^{Crisis} that takes the value 1 during the crisis period and 0 otherwise:

$$\boxed{CSAD_t = \alpha + \gamma_1 |R_{m,t}| + \gamma_2 R_{m,t}^2 + \gamma_3 D^{Crisis} R_{m,t}^2 + e_t} \quad (3)$$

- In Eq. (3), herding behavior is detected if γ_3 is negative and significant.

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- As in Chiang and Zheng (2010), we estimate the asymmetric behavior of return' dispersion

$$
\begin{aligned}
CSAD_t = \alpha + \gamma_1 D^{High}|R_{m,t}| + \gamma_2(1 - D^{High})|R_{m,t}| \\
+ \gamma_3 D^{High} R_{m,t}^2 + \gamma_4(1 - D^{High}) R_{m,t}^2 + e_t \quad (4)
\end{aligned}
$$

where D^{High} equals 1 if the market asymmetry on day t is greater than the previous 22-trading day (1-trading month) moving average and 0 otherwise.

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  2. credit deterioration;
  3. funding illiquidity;
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- Herding effect is present if γ_3 (γ_4) is negative and statistically significant. If $\gamma_3 < \gamma_4$ and these values are significant, the herding effects are more pronounced during the market distressed periods.

The following models underpin our analysis for the US and Eurozone:

$$\boxed{CSAD_{US,m,t} = \alpha + \gamma_1 |R_{US,m,t}| + \gamma_2 R^2_{US,m,t} + \delta_1 CSAD_{US,j,t} + \delta_2 R^2_{US,j,t} + e_t} \quad (5)$$

$$\boxed{CSAD_{EZ,m,t} = \alpha + \gamma_1 |R_{EZ,m,t}| + \gamma_2 R^2_{EZ,m,t} + \delta_1 CSAD_{EZ,j,t} + \delta_2 R^2_{EZ,j,t} + e_t} \quad (6)$$

where

- $CSAD_{US,m,t}$ ($CSAD_{EZ,m,t}$) is the CSAD referring to the N stock in the aggregate market portfolio at time t,

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- $CSAD_{US,j,t}$ ($CSAD_{EZ,j,t}$) is the CSAD referring to the n stock in the financial sector portfolio, or financial industry portfolio, at time t and
- $R^2_{US,j,t}$ ($R^2_{EZ,j,t}$) is the squared cross-sectional average of the corresponding n returns at time t.

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Fundamental vs Non-fundamental Information I

- CSAD due to non-fundamental information is estimated as the residuals in the regression:

$$\boxed{CSAD_t = \alpha + \beta_1(R_{m,t} - Rf_t) + \beta_2 HML_t + \beta_3 SMB_t + \beta_4 MOM_t + \varepsilon_t} \quad (7)$$

  where $(R_{m,t} - Rf_t)$ is the market risk premium, HML_t is the High Minus Low return factor, SMB_t is the Small Minus Big return factor, and MOM_t is the Momentum factor, at time t. The residuals of model (7) represent the measure of clustering due to investors responding to non-fundamental information:

$$CSAD_{NONFUND,t} = \varepsilon_t \quad (8)$$

- It follows that the difference between the total $CSAD_t$ and the $CSAD_{NONFUND,t}$ represents the measure of clustering due to investors responding to fundamental information:

$$CSAD_{FUND,t} = CSAD_t - CSAD_{NONFUND,t} \quad (9)$$

Fundamental vs Non-fundamental Information II

- "spurious" and "intentional" herding can be separated:

$$\boxed{CSAD_{NONFUND,t} = \alpha + \gamma_1 |R_{m,t}| + \gamma_2 R_{m,t}^2 + e_t} \quad (10)$$

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- In Eq. (10) and (11), herding effects driven by non-fundamental and fundamental information correspond to a negative and statistically significant γ_2.
- We estimate the coefficients of the following two regressions, similar to Eq. (3):

$$\boxed{CSAD_{NONFUND,t} = \alpha + \gamma_1 |R_{m,t}| + \gamma_2 R_{m,t}^2 + \gamma_3 D^{Crisis} R_{m,t}^2 + e_t} \quad (12)$$

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Fundamental vs Non-fundamental Information III

D^{Crisis} is a dummy variable that takes the value 1 during the crisis and 0 otherwise. In the presence of herding effects driven by non-fundamental and fundamental information, during the crisis period, γ_3 is negative and statistically significant in Eq. (12) and (13), respectively.

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- 3271 daily returns for the US, and 3327 daily returns for the Eurozone, from Bloomberg.

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- The economic and financial variables are: VIX (VSTOXX), CDX (iTraxx), and the US (EU) TED spread. They are all taken at daily frequency from Bloomberg. We also consider EPU for U.S. and Europe and daily returns of the SMB, HML and MOM factors have been downloaded from Kenneth French's online data library.

Descriptive statistics of CSAD and R_m for the US and Eurozone equity markets, financial sectors and industries.

Panel A: US equity market

	All US Equities		All Financial Industries		Banks		Diversified Financials		Insurance		Real Esta
	CSAD	R_m	CSAD	R_m	CSAD	R_m	CSAD	R_m	CSAD	R_m	CSAD
Mean	1.07	0.03	1.00	0.02	0.82	-0.00	0.98	0.03	0.83	0.01	0.84
Median	0.93	0.08	0.77	0.08	0.54	0.02	0.79	0.08	0.60	0.07	0.67
Max	5.31	10.61	8.36	16.27	11.43	19.85	8.30	14.69	11.99	14.58	7.94
Min	0.37	-10.93	0.28	-17.95	0.13	-22.88	0.23	-16.48	0.10	-14.62	0.21
Std	0.51	1.32	0.77	1.86	0.91	2.44	0.70	1.88	0.88	1.76	0.64
N	3271		3271		3271		3271		3271		3271

Panel B: Eurozone equity market

	All Eurozone Equities		All Financial Industries		Banks		Diversified Financials		Insurance		Real Esta
	CSAD	R_m	CSAD	R_m	CSAD	R_m	CSAD	R_m	CSAD	R_m	CSAD
Mean	1.07	0.02	1.06	0.00	1.13	-0.01	0.93	0.02	0.87	0.01	0.78
Median	0.95	0.07	0.89	0.03	0.94	0.01	0.79	0.08	0.68	0.06	0.61
Max	4.63	8.56	7.53	12.67	14.21	15.48	5.71	14.99	8.24	13.33	7.11
Min	0.40	-8.05	0.36	-12.37	0.23	-15.86	0.20	-12.00	0.19	-13.90	0.00
Std	0.45	1.21	0.63	1.64	0.76	1.93	0.53	1.54	0.67	1.67	0.62
N	3327		3327		3327		3327		3327		3327

	All Market Equities	All Financial Equities	Banks	Diversified Financials	Insurance	Real Esta
H_0: CSAD	0.36	3.91***	15.49***	-3.45***	1.96**	-3.80***
H_0: R_m	-0.40	-0.39	-0.18	-0.12	-0.13	-0.55

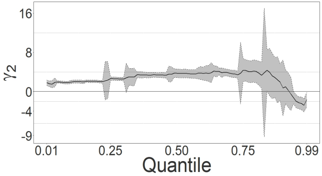
Estimates of herding behavior for the US and Eurozone equity markets and financial industries, during the period from January 2005 to December 2017.

	Panel A: United States				Panel B: Eurozone			
	γ_1	γ_2	α	Adj. R^2	γ_1	γ_2	α	Adj. R^2
All Market Equities								
OLS	0.261***	1.568***	0.008***	46.98%	0.209***	2.765***	0.009***	41.52%
Quantile Regression								
τ=10th	0.106***	1.936***	0.006***	12.57%	0.079***	3.088***	0.007***	13.42%
τ=25th	0.112***	2.639***	0.007***	14.96%	0.092***	3.677***	0.007***	16.00%
τ=50th	0.139***	3.729***	0.008***	20.40%	0.127***	4.212***	0.008***	19.97%
τ=75th	0.214***	4.382***	0.009***	27.15%	0.211***	3.894***	0.009***	25.22%
τ=95th	0.646***	-1.964**	0.012***	39.38%	0.581***	-1.229	0.012***	30.29%
τ=99th	0.517***	-1.621*	0.021***	36.07%	0.685***	-4.308**	0.020***	31.02%
Banks								
OLS	0.278***	0.466*	0.004***	53.64%	0.220***	1.774*	0.008***	44.74%
Quantile Regression								
τ=10th	0.077*	0.913	0.002***	14.31%	0.138***	1.011***	0.004***	15.54%
τ=25th	0.114***	0.947***	0.003***	19.36%	0.164***	1.315***	0.005***	18.34%
τ=50th	0.178***	0.993***	0.004***	26.04%	0.189***	1.797**	0.007***	21.93%
τ=75th	0.301***	0.775***	0.005***	32.86%	0.182***	3.155***	0.010***	26.23%
τ=95th	0.632***	0.039	0.009***	46.46%	0.328***	4.088***	0.015***	32.82%
τ=99th	1.091***	-2.887***	0.016***	47.56%	0.465***	2.602***	0.025***	33.15%
Diversified Financials								
OLS	0.281***	0.576	0.006***	47.93%	0.198***	1.111***	0.007***	32.53%
Quantile Regression								
τ=10th	0.132***	0.585***	0.004***	13.08%	0.067***	1.634***	0.004***	9.03%
τ=25th	0.128***	1.716***	0.005***	16.37%	0.100***	1.390***	0.005***	10.54%
τ=50th	0.180***	1.768***	0.006***	21.94%	0.141***	1.817***	0.006***	13.56%
τ=75th	0.283***	1.186***	0.008***	29.52%	0.225***	1.343***	0.008***	17.93%
τ=95th	0.540***	-0.293	0.012***	37.38%	0.466***	0.080	0.012***	26.10%
τ=99th	0.991***	-3.839***	0.020***	38.54%	0.318	3.649	0.022***	25.54%

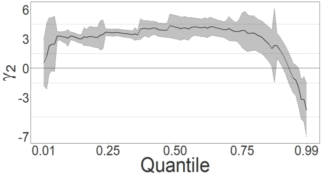
Estimates of herding behavior for the US and Eurozone equity markets and financial industries, during the period from January 2005 to December 2017.

	Panel A: United States				Panel B: Eurozone			
Insurance								
OLS	0.306***	2.001***	0.005***	60.21%	0.223***	1.969***	0.006***	46.32%
Quantile Regression								
τ=10th	0.047	3.045*	0.003***	13.96%	0.073***	2.023***	0.004***	13.52%
τ=25th	0.087***	3.349***	0.004***	19.63%	0.073***	3.113***	0.004***	16.95%
τ=50th	0.143***	3.325***	0.005***	26.69%	0.121***	3.116***	0.005***	21.77%
τ=75th	0.267***	3.502***	0.006***	35.47%	0.215***	2.599**	0.007***	27.15%
τ=95th	0.809***	-0.483	0.008***	51.48%	0.725***	-1.440**	0.010***	37.49%
τ=99th	1.175***	-3.346	0.016***	52.39%	0.992***	-3.847***	0.019***	36.35%
Real Estate								
OLS	0.274***	0.251	0.005***	58.90%	0.131***	2.708***	0.006***	25.92%
Quantile Regression								
τ=10th	0.105***	0.701***	0.004***	15.47%	0.023	2.298*	0.003***	5.46%
τ=25th	0.128***	1.050*	0.004***	19.49%	0.046***	2.698***	0.004***	8.25%
τ=50th	0.174***	1.169	0.005***	26.10%	0.069***	3.466***	0.005***	10.78%
τ=75th	0.206***	1.683*	0.007***	35.22%	0.141***	3.637***	0.007***	14.96%
τ=95th	0.482***	-0.144	0.009***	49.70%	0.457***	1.714	0.012***	21.57%
τ=99th	0.967***	-3.128***	0.013***	48.45%	0.603	0.996	0.022***	21.07%

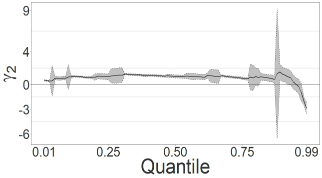
Quantile regression estimates of herding behavior for the US and Eurozone equity markets and financial industries, during the period from January 2005 to December 2017.



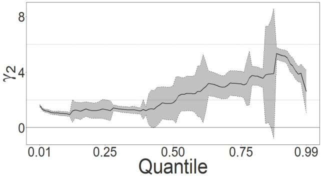
(a) US All Market Equities



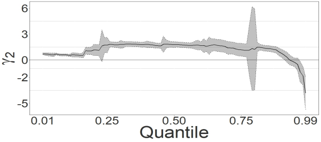
(b) EU All Market Equities



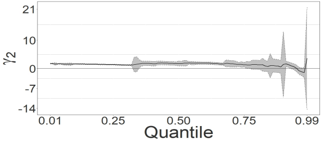
(a) US Banks



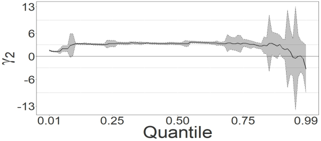
(b) EU Banks



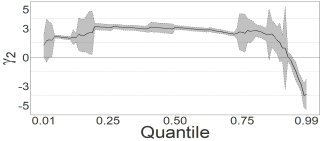
(a) US Div Financials



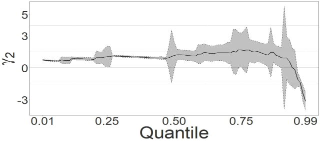
(b) EU Diversified Financials



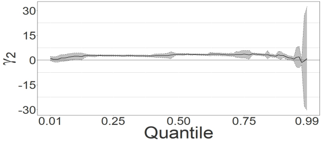
(a) US Insurance



(b) EU Insurance



(a) US Real Estate



(b) EU Real Estate

Herding behavior during crises

Estimates of herding behavior for the US and Eurozone equity markets and financial industries, during the GFC.

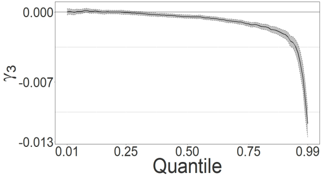
	Panel A: United States					Panel B: Eurozone				
	γ_1	γ_2	γ_3	α	Adj. R^2	γ_1	γ_2	γ_3	α	Adj. R^2
All Equities										
OLS	0.372***	-5.908***	6.605***	0.008***	53.00%	0.29***	-2.64	5.124***	0.008***	45.78%
Quantile										
τ=10th	0.22***	-3.48*	4.56***	0.006***	15.04%	0.15***	-0.21	3.25***	0.007***	15.85%
τ=25th	0.21***	-2.69**	5.09***	0.007***	18.53%	0.19***	-1.61*	4.72***	0.007***	18.65%
τ=50th	0.25***	-3.75***	6.62***	0.008***	24.38%	0.22***	-1.66	5.53***	0.008***	23.07%
τ=75th	0.28***	-3.87**	8.85***	0.009***	31.89%	0.26***	-1.48	8.81***	0.009***	28.94%
τ=95th	0.47	-6.26	11.31*	0.013***	41.86%	0.22	-0.11	20.02	0.013***	34.36%
τ=99th	0.48	-5.78	5.28	0.021***	37.26%	-0.16	7.39	26.89	0.023***	32.63%
Banks										
OLS	0.362***	-3.83***	3.851***	0.004***	57.19%	0.23***	0.35	1.840***	0.008***	46.76%
Quantile										
τ=10th	0.11***	-0.61	1.39*	0.002***	14.76%	0.14***	0.64	0.63	0.004***	15.77%
τ=25th	0.15***	-0.65	1.64***	0.003***	20.69%	0.17***	0.65***	0.92***	0.005***	18.69%
τ=50th	0.26***	-2.54***	3.08***	0.003***	28.76%	0.19***	1.22***	1.80***	0.007***	22.91%
τ=75th	0.41***	-5.19***	5.58***	0.004***	36.38%	0.23***	0.84***	2.77***	0.009***	27.53%
τ=95th	0.61***	-5.83***	6.30***	0.009***	48.72%	0.26***	0.43	7.38*	0.016***	35.63%
τ=99th	1.15***	-8.81***	5.68***	0.015***	49.08%	0.41***	-0.89	5.60**	0.025***	35.04%
Financials										
OLS	0.371***	-4.32***	4.318***	0.006***	52.12%	0.25***	-2.11	2.846***	0.007***	34.44%
Quantile										
τ=10th	0.23***	-3.74**	3.72***	0.003***	14.95%	0.12***	-0.93	2.04**	0.004***	9.68%
τ=25th	0.21***	-2.03**	3.28***	0.005***	19.08%	0.17***	-1.80**	2.70***	0.005***	11.55%
τ=50th	0.27***	-3.22***	4.41***	0.006***	24.82%	0.19***	-1.64**	3.22***	0.006***	14.84%
τ=75th	0.34***	-3.65***	4.94***	0.008***	32.14%	0.28***	-2.65***	4.43***	0.008***	19.61%
τ=95th	0.51***	-5.06***	5.52***	0.012***	39.57%	0.42*	-3.33	7.12	0.012***	27.58%
τ=99th	0.91	-8.79	7.40	0.020*	40.32%		0.34 -0.49	3.70	0.02***	26.01%

Herding behavior during crises

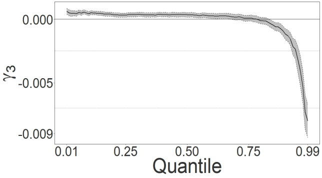
Estimates of herding behavior for the US and Eurozone equity markets and financial industries, during the GFC.

	Panel A: United States					Panel B: Eurozone				
	γ_1	γ_2	γ_3	α	Adj. R^2	γ_1	γ_2	γ_3	α	Adj. R^2
Insurance										
OLS	0.430***	-5.35***	6.436***	0.004***	64.17%	0.29***	-1.80	3.441***	0.005***	49.40%
Quantile										
τ=10th	0.11***	0.26	2.60***	0.003***	16.88%	0.13**	-0.29	2.25**	0.003***	14.96%
τ=25th	0.16***	-0.70	3.62***	0.003***	22.10%	0.14***	-0.15	2.76***	0.004***	18.71%
τ=50th	0.22***	-1.24	4.34***	0.004***	28.98%	0.19***	-0.52	3.12***	0.005***	23.54%
τ=75th	0.38***	-4.08***	6.62***	0.006***	38.42%	0.28***	-1.56**	4.36***	0.007***	29.42%
τ=95th	0.73***	-8.51***	11.46***	0.009***	53.83%	0.38	-0.47	13.77**	0.011***	40.47%
τ=99th	0.84	-8.98	15.47	0.018***	54.38%	0.67	-4.28	11.05	0.020	37.61%
Real Estate										
OLS	0.33***	-4.55***	4.40***	0.005***	62.93%	0.15***	0.17	2.98**	0.006***	28.17%
Quantile										
τ=10th	0.19***	-3.51***	3.82***	0.003***	18.28%	0.08***	-0.89	3.06***	0.003***	7.67%
τ=25th	0.20***	-3.12**	3.54***	0.004***	22.56%	0.13***	-1.53*	3.25***	0.003***	9.91%
τ=50th	0.26***	-3.70***	4.16***	0.005***	29.38%	0.15***	-1.71	4.80***	0.005***	12.73%
τ=75th	0.28***	-3.59***	4.64***	0.006***	38.29%	0.19***	-1.43	5.83***	0.007***	17.25%
τ=95th	0.48***	-4.44***	4.38***	0.009***	51.39%	0.13	2.32***	14.07***	0.013***	24.83%
τ=99th	1.00***	-10.19***	6.90***	0.013***	50.27%	-0.09	3.45	22.40	0.025***	23.96%

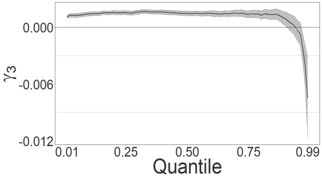
Quantile regression estimates of herding behavior for the US and Eurozone equity markets and financial industries, during the EZC.



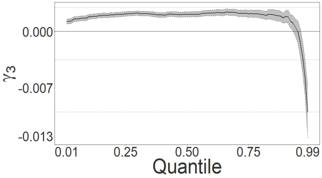
(a) US All Market Equities



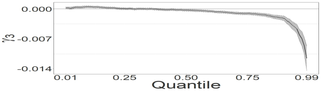
(b) EU All Market Equities



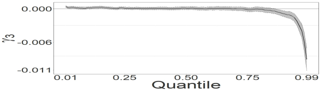
(a) US Banks



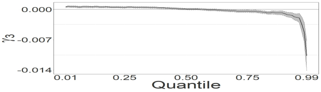
(b) EU Banks



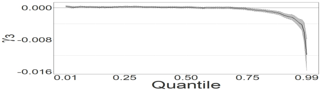
(a) US Div Financials



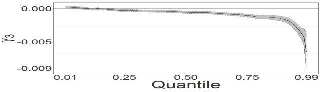
(b) EU Diversified Financials



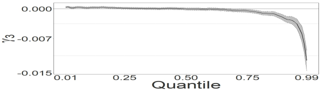
(a) US Insurance



(b) EU Insurance



(a) US Real Estate



(b) EU Real Estate

Estimates of herding behavior for the US and Eurozone equity markets and financial industries, during days of high and low funding illiquidity.

	Panel A: United States							Panel B: Eurozone						
	γ_1	γ_2	γ_3	γ_4	α	Adj. R^2	$\gamma_3 = \gamma_4$	γ_1	γ_2	γ_3	γ_4	α	Adj. R^2	$\gamma_3 = \gamma_4$
All Market Equities														
OLS	0.215***	0.302***	1.649***	1.698*	0.008***	48.24%	-0.049	0.172***	0.242***	3.062***	2.548***	0.009***	41.97%	0.515
Quantile Regression														
τ=10th	0.092***	0.114	2.005***	2.443	0.006***	12.96%	-0.438	0.075***	0.083***	3.214***	3.020***	0.007***	13.45%	0.194
τ=25th	0.101***	0.117***	2.149***	3.546***	0.007***	15.85%	-1.398***	0.102***	0.093***	3.087***	3.880***	0.007***	16.04%	-0.793
τ=50th	0.119***	0.159***	3.365***	4.205***	0.008***	21.13%	-0.840	0.126***	0.137***	3.817***	4.757***	0.008***	20.11%	-0.940
τ=75th	0.161***	0.299***	3.503**	3.135*	0.009***	28.22%	0.368	0.197***	0.276***	3.411***	3.363***	0.009***	25.59%	0.048
τ=95th	0.407**	0.729***	2.487	-2.939***	0.012***	40.04%	5.426	0.373***	0.768***	1.765	-4.538***	0.012***	31.53%	6.304***
τ=99th	0.542***	0.517***	-2.584***	-1.621*	0.021***	36.10%	-0.963	0.496***	0.737***	-1.609	-5.480***	0.020***	31.39%	3.870*
Banks														
OLS	0.222***	0.331***	0.793**	0.157	0.004***	54.35%	0.637	0.202***	0.186***	1.196***	3.169**	0.008***	46.70%	-1.973
Quantile Regression														
τ=10th	0.073***	0.098***	0.746***	0.896***	0.002***	15.14%	-0.150	0.128***	0.132***	1.025***	1.366***	0.005***	15.76%	-0.341
τ=25th	0.086***	0.140***	1.136***	0.761***	0.003***	20.05%	0.374	0.151***	0.162***	1.265***	1.976**	0.005***	18.66%	-0.711
τ=50th	0.132***	0.206***	1.539***	0.819***	0.004***	26.54%	0.720***	0.195***	0.178***	1.211***	2.896**	0.007***	22.26%	-1.685
τ=75th	0.235***	0.393***	1.082***	-0.076	0.005***	33.73%	1.157***	0.168***	0.232***	2.996***	3.454***	0.009***	26.80%	-0.458
τ=95th	0.471***	0.690***	1.118**	-0.142	0.009***	47.02%	1.260	0.034	0.396***	7.958***	3.581***	0.015***	34.04%	4.377**
τ=99th	0.875***	1.186***	-1.942***	-3.579	0.016***	48.08%	1.637	0.089	0.607***	9.865	1.562	0.026***	33.93%	8.303
Diversified Financials														
OLS	0.261***	0.298***	0.584	0.625	0.006***	48.19%	-0.041	0.170***	0.216***	1.185***	1.163**	0.007***	32.88%	0.022
Quantile Regression														
τ=10th	0.123***	0.131***	0.638***	1.277***	0.004***	13.53%	-0.638**	0.058***	0.086***	1.713***	1.341***	0.004***	9.20%	0.372*
τ=25th	0.136***	0.153***	1.060***	1.633***	0.005***	16.96%	-0.572*	0.082***	0.107***	1.504***	1.851***	0.005***	10.73%	-0.346
τ=50th	0.152***	0.191***	1.740***	1.949***	0.006***	22.29%	-0.209	0.112***	0.153***	2.001***	1.760***	0.007***	13.72%	0.241
τ=75th	0.244***	0.302	1.441	1.401	0.008***	29.78%	0.039	0.194***	0.241***	1.487***	1.760	0.008***	18.21%	-0.273
τ=95th	0.489***	0.545***	-0.153	-0.340	0.012***	37.40%	0.187	0.393***	0.546***	-0.358	-0.746	0.012***	26.51%	0.388
τ=99th	1.228***	1.003***	-5.823**	-3.907***	0.019***	38.71%	-1.916	-0.036	0.335	16.410	3.337	0.022***	26.16%	13.073
Insurance														
OLS	0.251***	0.363***	2.369***	1.584***	0.005***	60.69%	0.785	0.186***	0.259***	2.137***	1.814***	0.006***	46.79%	0.322
Quantile Regression														
τ=10th	0.084***	0.074***	1.261***	3.390***	0.003***	16.13%	-2.130***	0.061***	0.085***	2.114***	2.004***	0.004***	13.81%	0.110
τ=25th	0.074***	0.128***	3.111***	3.182***	0.004***	20.63%	-0.071	0.069**	0.078***	3.012***	3.170***	0.004***	17.05%	-0.158
τ=50th	0.100***	0.184***	3.535***	3.030***	0.005***	27.27%	0.505**	0.110***	0.143***	2.767***	3.026***	0.005***	22.09%	-0.260
τ=75th	0.185***	0.374***	4.309***	2.033**	0.006***	36.13%	2.276**	0.173***	0.274***	3.135**	2.111	0.007***	27.60%	1.024
τ=95th	0.643***	0.915***	2.697	-2.446***	0.008***	51.95%	5.143	0.447*	0.860***	1.447	-2.431***	0.010***	38.59%	3.877
τ=99th	1.069***	0.784	-2.276	7.739	0.018***	52.76%	-10.015	1.127***	1.215***	-6.401***	-5.357***	0.017***	36.45%	-1.044
Real Estate														
OLS	0.238***	0.310***	0.319	0.103	0.005***	59.72%	0.216	0.071***	0.198***	3.620***	1.653**	0.006***	26.88%	1.967**
Quantile Regression														
τ=10th	0.101***	0.117***	0.658***	1.095***	0.004***	16.52%	-0.436*	0.031	0.026*	1.511	2.965***	0.003***	6.14%	-1.454
τ=25th	0.122***	0.141***	0.542***	1.065***	0.004***	20.32%	-0.523***	0.042**	0.062***	2.507***	2.659***	0.004***	8.58%	-0.151
τ=50th	0.142***	0.206***	1.502	0.978***	0.005***	26.71%	0.524	0.043***	0.113***	3.797***	2.769***	0.005***	11.17%	1.028
τ=75th	0.173***	0.302***	1.652***	0.729	0.006***	36.35%	0.924	0.098***	0.220***	4.252***	2.052***	0.007***	15.39%	2.199***
τ=95th	0.206***	0.565***	3.433***	-1.100***	0.010***	50.64%	4.533***	0.295*	0.710***	5.175	-4.189*	0.012***	22.35%	9.364*
τ=99th	0.856***	1.132***	-3.215***	-3.921***	0.013***	49.42%	0.706	-0.304	0.689*	20.989***	-3.467	0.024***	23.17%	24.455**

Estimates of herding behavior for the US and Eurozone equity markets and financial industries, during days of high and low economic policy uncertainty.

	Panel A: United States							Panel B: Eurozone						
	γ_1	γ_2	γ_3	γ_4	α	Adj. R^2	$\gamma_3 = \gamma_4$	γ_1	γ_2	γ_3	γ_4	α	Adj. R^2	$\gamma_3 = \gamma_4$
All Market Equities														
OLS	0.219***	0.277***	2.785***	1.032	0.008***	47.35%	1.753*	-0.144	0.525	295.732***	141.891	0.009***	39.94%	153.840
Quantile Regression														
τ=10th	0.060	0.117***	3.689*	1.759***	0.006***	12.96%	1.930	-0.506	-0.469	241.969***	263.042***	0.008***	12.87%	-21.073
τ=25th	0.070***	0.131***	4.132***	1.874***	0.007***	15.59%	2.258***	-0.938***	-0.614***	412.230***	268.875***	0.009***	15.48%	143.355***
τ=50th	0.110***	0.151***	4.451***	3.524***	0.008***	20.58%	0.928	-0.628**	-0.149	372.704***	208.573***	0.009***	20.89%	164.130**
τ=75th	0.210***	0.250***	4.480***	3.051	0.009***	27.22%	1.428	-0.347	-0.031	322.590***	192.417***	0.011***	26.35%	130.173
τ=95th	0.648***	0.675***	-1.987**	-3.090***	0.012***	39.47%	1.103	3.333***	7.924***	-88.036	-765.310***	0.011***	37.12%	677.274***
τ=99th	0.498***	0.459***	-1.113	-1.826***	0.021***	36.35%	0.712	4.059***	8.451***	-192.436	-853.523***	0.012***	54.65%	661.087***
Banks														
OLS	0.253***	0.295***	0.935***	0.125	0.004***	54.24%	0.810**	-0.034	0.964	168.478***	43.904	0.009***	52.41%	124.574**
Quantile Regression														
τ=10th	0.075***	0.075***	0.812***	1.012***	0.002***	14.48%	-0.200*	-0.042	0.190*	110.604***	71.943***	0.006***	20.15%	38.662***
τ=25th	0.092***	0.117***	1.412***	0.909***	0.003***	19.58%	0.503	-0.221	0.307	131.659***	61.025**	0.007***	21.27%	70.634*
τ=50th	0.155***	0.183***	1.436***	0.923***	0.004***	26.38%	0.513***	-0.665*	0.045	220.582***	136.443***	0.009***	23.10%	84.139*
τ=75th	0.265***	0.338***	1.541***	0.182**	0.005***	33.35%	1.359***	0.081	0.783**	157.782***	67.374**	0.010***	31.58%	90.408**
τ=95th	0.608***	0.596***	0.502	0.229	0.009***	46.47%	0.273	0.006	3.801***	310.837**	-121.043	0.013***	52.71%	431.881***
τ=99th	1.055**	1.172***	-2.132	-3.914***	0.015***	47.77%	1.782	1.754**	2.423***	93.445	-14.547	0.017***	62.91%	107.992
Diversified Financials														
OLS	0.259***	0.296***	0.907*	0.352	0.006***	48.02%	0.555	-0.648**	0.265	275.358***	123.095*	0.008***	33.72%	152.264*
Quantile Regression														
τ=10th	0.121***	0.145***	0.538***	0.505***	0.004***	13.30%	0.033	-0.373	-0.032	132.906***	66.991**	0.006***	8.73%	65.916
τ=25th	0.125***	0.148	1.830***	1.168	0.005***	16.51%	0.662	-0.716**	-0.677**	177.097***	193.616***	0.008***	6.92%	-16.519
τ=50th	0.175***	0.201***	1.831***	1.387***	0.006***	22.02%	0.444*	-1.229***	-0.579***	370.579***	174.965***	0.008***	13.81%	195.614***
τ=75th	0.273***	0.291***	1.150***	1.112**	0.008***	29.60%	0.037	-0.789*	-0.553	315.137***	269.621***	0.009***	20.98%	45.515
τ=95th	0.459***	0.545***	1.130	-0.341	0.012***	37.39%	1.472	-0.311	4.662***	391.515**	-239.725	0.012***	40.95%	631.240***
τ=99th	1.044***	0.761***	-4.598***	-2.219*	0.020***	39.06%	-2.379*	0.944**	6.670***	141.004**	-584.031***	0.013***	51.64%	725.035***
Insurance														
OLS	0.294***	0.319***	2.290***	1.708**	0.005***	60.27%	0.581	0.363	0.359	105.748***	126.095***	0.007***	45.91%	-20.347
Quantile Regression														
τ=10th	0.028*	0.083***	3.584***	1.846***	0.003***	14.50%	1.738***	-0.254**	-0.433***	145.243***	181.699***	0.005***	17.95%	-36.456*
τ=25th	0.080***	0.098***	3.419***	3.058***	0.004***	19.73%	0.361	-0.260	-0.424**	143.530***	176.221***	0.006***	20.57%	-32.691
τ=50th	0.139***	0.127***	3.271***	3.885***	0.005***	26.83%	-0.614***	-0.067	-0.348**	129.919***	200.610***	0.007***	25.32%	-70.691***
τ=75th	0.264***	0.285***	3.537***	3.072***	0.006***	35.52%	0.465	0.717***	0.525**	82.625***	126.336***	0.007***	31.39%	-43.711
τ=95th	0.763***	0.773***	1.514	-0.716	0.008***	51.68%	2.230	4.004***	7.386***	-114.554	-446.877**	0.008***	39.71%	332.323
τ=99th	0.910	1.176*	10.229	-3.593	0.017	52.46%	13.821	-9.258***	-0.040	1426.186***	-9.886	0.034***	28.26%	1436.072***
Real Estate														
OLS	0.258***	0.288***	0.433**	0.099	0.005***	59.02%	0.334	0.047	-0.296	137.499***	189.716***	0.007***	33.99%	-52.217
Quantile Regression														
τ=10th	0.082***	0.109***	1.051***	0.621***	0.004***	15.72%	0.430***	-0.477***	-0.583***	187.079***	192.655***	0.005***	15.33%	-5.576
τ=25th	0.112***	0.137***	1.209***	0.918**	0.004***	19.65%	0.292	-0.358**	-0.371**	174.612***	170.393***	0.005***	17.91%	4.218
τ=50th	0.171***	0.184***	0.903***	1.046	0.005***	26.29%	-0.143	-0.080	-0.169	145.732***	150.116***	0.006***	20.89%	-4.384
τ=75th	0.220**	0.222***	1.295	1.526*	0.006***	35.35%	-0.231	-0.163	-1.048	137.492	357.26***	0.008***	22.89%	-219.767*
τ=95th	0.530***	0.494***	-0.628	-0.448	0.009***	49.76%	-0.180	-0.247	1.320	392.088	28.558	0.012***	27.89%	363.530
τ=99th	0.951***	1.021***	-3.049***	-4.016***	0.013***	48.74%	0.967	-10.220***	-5.471***	1326.608***	473.041**	0.037***	10.52%	853.567***

Main results on Asymmetric Market Conditions I

- for the implied volatility OLS estimates for the US and Eurozone equity markets and financial industries show that there is no evidence of herding effects during higher and lower volatility conditions of the market. However, the quantile regression provides evidence of herding effects in higher volatility conditions for the equity market and all the financial industries, except the insurance, in the U.S.. The herding effects is encountered for high quantiles, indicating a more likely herding behavior during extreme stressed market in case of higher volatility.
- for credit deterioration the OLS shows no effects, neither in the lower nor in the higher credit deterioration conditions, for equity markets and the financial industries. The quantile estimates, the US equity market and all its financial industries tend to herd more in the case of higher credit deterioration conditions, in the high quantiles; in the Eurozone, the equity market, the diversified financials and the insurance are found to herd in larger size in the case of higher credit deterioration. There is no evidence of herding for the banks, while, the real estate tend to herd in case of lower credit deterioration, in the extreme quantiles.

Main results on Asymmetric Market Conditions II

- for the economic policy uncertain the OLS analysis does not show any evidence of herding effects. The quantile regression shows herding effects during higher economic policy uncertainty conditions for the US equity market and the related banking and real estate industries. In the Eurozone, there was no evidence of herding effects related to γ_3, but γ_4 is negative and significant for the equity market and the related diversified financials and insurance industries, in the upper extreme quantiles.

Estimates of herding behavior due to non-fundamentals and fundamentals for the US and Eurozone equity markets and financial industries.

	Panel A: United States				Panel B: Eurozone			
	$CSAD_{NONFUND,t}$		$CSAD_{FUND,t}$		$CSAD_{NONFUND,t}$		$CSAD_{FUND,t}$	
	γ_1	γ_2	γ_1	γ_2	γ_1	γ_2	γ_1	γ_2
AllEquities								
OLS	0.253***	1.693***	0.008**	-0.133	0.184***	2.751***	0.019***	0.071
Quantile								
τ=10th	0.108***	1.737***	-0.014***	-0.204***	0.056**	2.840***	-0.009	0.024
τ=25th	0.120***	2.472	-0.013*	-0.007	0.084***	2.908***	-0.001	-0.024
τ=50th	0.147***	3.261***	0.001	0.014	0.120***	3.821***	0.017***	0.039
τ=75th	0.211***	4.011*	0.017***	0.018	0.229***	3.032***	0.028***	0.374***
τ=95th	0.608***	-1.797***	0.028*	0.082	0.546***	-1.115	0.070***	0.101
τ=99th	0.473***	-1.380**	0.027	0.330	0.661***	-4.362***	0.099***	-0.127
Banks								
OLS	0.274***	0.451*	0.005**	0.006	0.204***	1.767*	0.010***	0.034
Quantile								
τ=10th	0.077***	0.814	-0.027***	0.107***	0.107***	1.259***	-0.003	-0.043
τ=25th	0.110***	0.998***	-0.011***	0.066***	0.148***	1.372***	-0.006*	0.139***
τ=50th	0.176***	0.996***	0.003	0.029	0.174***	1.981**	0.006	0.082
τ=75th	0.297***	0.763***	0.024***	-0.074***	0.165***	3.226***	0.020***	0.003
τ=95th	0.640***	-0.229	0.047***	-0.120**	0.324***	4.039***	0.033	0.210
τ=99th	1.156***	-3.210***	0.055***	-0.167	0.466***	2.447***	0.064***	-0.120
Financials								
OLS	0.272***	0.634	0.005**	-0.040	0.176***	1.154***	0.016***	-0.001
Quantile								
τ=10th	0.124***	0.631***	-0.011***	-0.062***	0.038***	1.801***	-0.008	0.050
τ=25th	0.124***	1.726***	-0.007***	-0.013	0.079***	1.480***	-0.003	0.073***
τ=50th	0.175***	1.715***	0.003*	-0.021	0.138***	1.257***	0.012**	0.005
τ=75th	0.259***	1.598**	0.013***	0.010	0.192***	1.541***	0.021***	0.205**
τ=95th	0.501***	0.036	0.027***	-0.063	0.429***	0.569	0.057***	-0.146**
τ=99th	0.902***	-3.165***	0.036***	-0.100	0.331	2.925	0.072	0.154

Estimates of herding behavior due to non-fundamentals and fundamentals for the US and Eurozone equity markets and financial industries.

	Panel A: United States				Panel B: Eurozone			
	$CSAD_{NONFUND,t}$		$CSAD_{FUND,t}$		$CSAD_{NONFUND,t}$		$CSAD_{FUND,t}$	
	γ_1	γ_2	γ_1	γ_2	γ_1	γ_2	γ_1	γ_2
Insurance								
OLS	0.301***	2.034***	0.005**	-0.037	0.204***	1.995***	0.014***	0.010
Quantile								
τ=10th	0.051	2.832**	-0.026***	0.106***	0.050***	1.987***	-0.008*	0.044
τ=25th	0.082***	3.452***	-0.014***	0.062	0.053***	3.024***	0.000	0.035
τ=50th	0.139***	3.324***	0.002	0.016	0.098***	3.070***	0.010**	0.079
τ=75th	0.270***	3.203***	0.019***	-0.075**	0.201***	2.922**	0.023***	0.027
τ=95th	0.790***	-0.373	0.033***	-0.070***	0.730***	-1.440***	0.050***	0.033
τ=99th	1.201***	-3.791***	0.037***	-0.070	0.971***	-3.639***	0.100***	-0.514***
Real Estate								
OLS	0.274***	0.240	0.002	-0.004	0.113***	2.783***	0.011***	-0.003
Quantile								
τ=10th	0.116***	0.594***	-0.012***	-0.031	0.028	1.839	-0.004	-0.072
τ=25th	0.125***	1.112***	-0.010***	0.061***	0.029*	2.711***	-0.001	0.032
τ=50th	0.172***	1.213**	0.001	0.005	0.058***	3.479***	0.003	0.075
τ=75th	0.204***	1.899***	0.010***	-0.026***	0.123**	3.609*	0.016*	0.065
τ=95th	0.466***	0.020	0.018***	0.050	0.428***	1.187	0.045***	-0.042
τ=99th	0.989***	-3.249***	0.025*	0.002	0.359	4.824	0.059	0.203

Quantile regression estimates of herding behavior for the US and Eurozone equity markets and financial industries, during the EZC.

	Panel A: United States						Panel B: Eurozone					
	$CSAD_{NONFUND,t}$			$CSAD_{FUND,t}$			$CSAD_{NONFUND,t}$			$CSAD_{FUND,t}$		
	γ_1	γ_2	γ_3	γ_1	γ_2	γ_3	γ_1	γ_2	γ_3	γ_1	γ_2	γ_3
All Market Equities												
OLS	0.297***	1.494***	-4.667***	0.007*	-0.128	0.121	0.209***	2.764***	-3.011***	0.019***	0.071	-0.015
Quantile Regression												
τ=10th	0.104***	1.779***	0.000	-0.014***	-0.204***	0.000	0.051**	2.844***	0.000**	-0.013**	0.065	0.000*
τ=25th	0.113	2.771	0.000	-0.013*	-0.006	0.000	0.071***	3.070***	0.000***	0.000	-0.036	0.000*
τ=50th	0.152***	3.158***	0.000***	0.001	0.010	0.000	0.118***	3.855***	0.000**	0.016***	0.050	0.000
τ=75th	0.206***	3.992*	-0.001***	0.017***	0.019	0.000	0.231***	2.998***	0.000	0.028***	0.372***	0.000
τ=95th	0.510***	-0.630	-0.005***	0.025	0.179	0.000	0.463***	-0.275	-0.003***	0.070***	0.110	0.000
τ=99th	0.415***	-0.796	-0.011***	0.026	0.329	0.000***	0.575***	-3.440***	-0.008***	0.117***	-0.325	0.000***
Banks												
OLS	0.310***	0.270	-2.531***	0.004	0.011	0.068	0.217***	1.818*	-1.114**	0.012***	0.038	-0.100
Quantile Regression												
τ=10th	0.056***	0.901***	0.002***	-0.026***	0.105***	0.000	0.090***	1.378***	0.002***	-0.007	-0.025	0.000***
τ=25th	0.091***	1.136***	0.001***	-0.012***	0.070***	0.000	0.120***	1.597***	0.002***	-0.006*	0.140***	0.000**
τ=50th	0.152***	1.156***	0.001***	0.004	0.026	0.000	0.168***	1.874***	0.002***	0.006	0.080	0.000
τ=75th	0.288***	0.811***	0.001***	0.024***	-0.073***	0.000	0.153***	3.361***	0.002***	0.022***	-0.005	0.000
τ=95th	0.625***	-0.150	-0.001	0.045***	-0.112**	0.000**	0.323***	4.026***	-0.001	0.038	0.131	0.000
τ=99th	1.088***	-2.964***	-0.008***	0.054***	-0.131	-0.001***	0.378***	2.949***	-0.012***	0.062***	-0.123	-0.001***
Diversified Financials												
OLS	0.312***	0.425	-3.293***	0.005**	-0.037	0.048	0.197***	1.017***	-1.984***	0.015***	0.002	0.044
Quantile Regression												
τ=10th	0.123***	0.641***	0.000***	-0.011***	-0.062***	0.000	0.039***	1.794***	0.000	-0.009	0.067	0.000*
τ=25th	0.124***	1.727***	0.000	-0.007***	-0.015	0.000	0.079***	1.484***	0.000	-0.004	0.078***	0.000*
τ=50th	0.174***	1.720***	0.000*	0.003**	-0.022	0.000	0.140***	1.231***	0.000	0.012**	0.003	0.000
τ=75th	0.260***	1.457	-0.001***	0.012***	0.012	0.000	0.200***	1.443***	0.000	0.021***	0.208**	0.000
τ=95th	0.448***	0.332	-0.005***	0.025***	-0.037	0.000**	0.408***	0.716	-0.002***	0.057***	-0.151**	0.000
τ=99th	0.805***	-2.600**	-0.012***	0.036***	-0.114	0.000***	0.424	2.457	-0.010***	0.077*	0.096	0.000
Insurance												
OLS	0.366***	1.607***	-5.005***	0.004*	-0.035	0.031	0.237***	1.872***	-2.480***	0.016***	0.004	-0.114
Quantile Regression												
τ=10th	0.037	2.885**	0.001***	-0.026***	0.102***	0.000**	0.047***	2.021***	0.000	-0.011**	0.066*	0.000***
τ=25th	0.073***	3.523***	0.001***	-0.014***	0.064	0.000	0.053***	3.029***	0.000	0.000	0.039	0.000**
τ=50th	0.135***	3.369***	0.000	0.002	0.014	0.000	0.098***	3.066***	0.000	0.010**	0.078	0.000
τ=75th	0.271***	3.171***	0.000**	0.020***	-0.081**	0.000	0.211***	2.759**	-0.001**	0.022***	0.025	0.000*
τ=95th	0.776***	-0.365	-0.002***	0.032***	-0.065***	0.000***	0.686***	-1.181***	-0.004***	0.052***	0.017	0.000**
τ=99th	0.980***	-1.329	-0.011***	0.035***	-0.024	0.000***	0.788***	-2.503**	-0.012***	0.096***	-0.487**	0.000
Real Estate												
OLS	0.301***	0.090	-3.021***	0.002	-0.003	0.019	0.152***	2.511***	-4.669***	0.009***	0.008	0.188
Quantile Regression												
τ=10th	0.115***	0.605***	0.000	-0.012***	-0.031	0.000	0.028	1.837	0.000	-0.007	-0.006	0.000**
τ=25th	0.126***	1.099***	0.000***	-0.010***	0.061***	0.000	0.029*	2.711***	0.000	0.000	0.025	0.000
τ=50th	0.173***	1.153*	-0.001***	0.001	0.010	0.000	0.057***	3.487***	0.000	0.003	0.084	0.000*
τ=75th	0.206***	1.780**	-0.001***	0.010***	-0.025***	0.000	0.129**	3.332**	-0.001***	0.016*	0.070	0.000
τ=95th	0.447***	0.133	-0.003***	0.019***	0.037	0.000	0.403***	1.325	-0.004***	0.045***	-0.040	0.000
τ=99th	0.787***	-2.362***	-0.007***	0.026*	0.011	0.000*	0.334	4.228	-0.013***	0.051	0.454	0.000**

Conclusion I

- Our analysis based on the entire sample period (January 2005 – December 2017) documents a diverse presence of herding behavior.
- We found evidence of herding in the high quantiles for the US
    - equity market,
    - banks,
    - diversified financials
    - real estate industries,

  while for the Eurozone,
    - equity market
    - insurance industry
- presence of herding only for distressed market states
- no evidence of herding during the GFC, even with quantile regressions.
- significant herding effects, with both OLS and quantile regressions, during the EZC for both equity markets and all the financial industries.
- The results suggest that during the EZC, US investors tended to herd also when the market was moderately turbulent while, in the Eurozone herding is detected only for high quantiles.

Conclusion II

- herding in US is more likely during extreme distressed market states in case of higher volatility, while, in the Eurozone, this trend is documented only for the diversified financials industry.
- Eurozone's banks and insurance industries tend to herd more in case of lower volatility
- credit deterioration impacts herding in the US and Eurozone equity markets and financial industries, except of the banks industry in the Eurozone.
- Similar results are found in the case of funding illiquidity market asymmetry conditions.
- presence of spillover herding effects from the insurance industry to the domestic market in the U.S. and from the banks to the domestic market in the Eurozone.
- evidence of "intentional" herding in the US equity market and all the financial industries while in the Eurozone, it is detected for the equity market and the insurance industry,
- presence of "spurious" herding for the diversified financials and, again, the insurance industries.

Conclusion III

- during the GFC, our results indicate that the herding behavior was "spurious" more than "intentional".
- contrary to what we find during the GFC, the US and the Eurozone equity markets and financial industries tended to herd due to non-fundamental information – "intentional" herding, during the EZC.

Summary of the results.

	Panel A: United States					Panel B: Eurozone				
	All Market Equities	Banks	Diversified Financials	Insurance	Real Estate	All Market Equities	Banks	Diversified Financials	Insurance	Real Estate
Herding behavior during the full sample (Dec. 2005 - Jan. 2017)	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	No	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	No	No	Yes - $\tau = 95^{th}$ and 99^{th}	No
Herding behavior during crises										
Global financial crisis	No	No	No	No	No	No	No	No	No	No
Eurozone Crisis	Yes - OLS and $\tau = 50^{th}$ to 99^{th}	Yes - OLS and $\tau = 99^{th}$	Yes - OLS and $\tau = 75^{th}$ to 99^{th}	Yes - OLS and $\tau = 95^{th}$ and 99^{th}	Yes - OLS and $\tau = 50^{th}$ to 99^{th}	Yes - OLS and $\tau = 95^{th}$ and 99^{th}	Yes - OLS and $\tau = 99^{th}$	Yes - OLS and $\tau = 95^{th}$ and 99^{th}	Yes - OLS and $\tau = 95^{th}$ and 99^{th}	Yes - OLS and $\tau = 95^{th}$ and 99^{th}
Herding behavior under asymmetric market conditions										
(i) High volatility	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	No	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	No	Yes - $\tau = 95^{th}$	Yes - $\tau = 99^{th}$	No
(i) Low volatility	Yes - $\tau = 95^{th}$	No	Yes - $\tau = 99^{th}$	No	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 99^{th}$	No	Yes - $\tau = 95^{th}$ and 99^{th}	No
(ii) High credit deterioration	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 99^{th}$	No	Yes - $\tau = 95^{th}$	Yes - $\tau = 95^{th}$ and 99^{th}	No
(ii) Low credit deterioration	No	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	No	Yes - $\tau = 99^{th}$	No	No	No	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 99^{th}$
(iii) High funding illiquidity	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	No	Yes - $\tau = 99^{th}$	No	No	No	Yes - $\tau = 99^{th}$	No
(iii) Low funding illiquidity	Yes - $\tau = 95^{th}$ and 99^{th}	No	Yes - $\tau = 99^{th}$	Yes - $\tau = 95^{th}$	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 95^{th}$ and 99^{th}	No	No	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 95^{th}$ and 99^{th}
(iv) High economic policy uncertainty	Yes - $\tau = 95^{th}$	No	Yes - $\tau = 99^{th}$	No	Yes - $\tau = 99^{th}$	No	No	No	No	No
(iv) Low economic policy uncertainty	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	No	Yes - $\tau = 99^{th}$	Yes - $\tau = 95^{th}$ and 99^{th}	No	Yes - $\tau = 99^{th}$	Yes - $\tau = 95^{th}$	No
Herding spillovers										
Financial sector	No					Yes - OLS and $\tau = 10^{th}$ and 75^{th}				
Banks	Yes - $\tau = 10^{th}$					Yes - $\tau = 95^{th}$				
Diversified Financials	Yes - $\tau = 99^{th}$					Yes - $\tau = 25^{th}$				
Insurance	Yes - OLS and $\tau = 10^{th}$ to 50^{th} and 95^{th}					Yes - $\tau = 10^{th}$				
Real Estate	No					No				
Non-fundamental and fundamental herding										
Full sample (Dec. 2005 - Jan. 2017)										
Non-fundamental herding	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	Yes - $\tau = 99^{th}$	No	No	Yes - $\tau = 95^{th}$ and 99^{th}	No
Fundamental herding	Yes - $\tau = 10^{th}$	Yes - $\tau = 75^{th}$ and 95^{th}	Yes - $\tau = 10^{th}$	Yes - $\tau = 95^{th}$	Yes - $\tau = 75^{th}$	No	Yes - $\tau = 25^{th}$	No	Yes - $\tau = 10^{th}$	No
Global financial crisis										
Non-fundamental herding	No	No	No	No	No	No	No	No	No	No
Fundamental herding	Yes - $\tau = 75^{th}$	No	Yes - $\tau = 75^{th}$	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 95^{th}$ and 99^{th}	Yes - $\tau = 25^{th}$	Yes - $\tau = 25^{th}$	Yes - OLS and $\tau = 25^{th}$ and 99^{th}	No	Yes - $\tau = 95^{th}$ and 99^{th}
Eurozone Crisis										
Non-fundamental herding	Yes - OLS and $\tau = 75^{th}$ to 99^{th}	Yes - OLS and $\tau = 99^{th}$	Yes - OLS and $\tau = 75^{th}$ to 99^{th}	Yes - OLS and $\tau = 95^{th}$ and 99^{th}	Yes - OLS and $\tau = 50^{th}$ to 99^{th}	Yes - OLS and $\tau = 95^{th}$ and 99^{th}	Yes - OLS and $\tau = 99^{th}$	Yes - OLS and $\tau = 95^{th}$ and 99^{th}	Yes - OLS and $\tau = 75^{th}$ to 99^{th}	Yes - OLS and $\tau = 75^{th}$ to 99^{th}
Fundamental herding	No	Yes - $\tau = 99^{th}$	No	No	No	No	Yes - $\tau = 99^{th}$	No	No	No

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