Stock price synchronicity, crash risk, and emerging-market institutional trading

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Research background

- Investors' ownership plays a monitoring role over firms' management (Chen, Harford, & Li, 2007)
  - Typically, larger shareholders' monitoring may resolve agency problem (Shleifer & Vishny, 1986)
  - Institutions tend to pay more attention to firm management as their shareholding increases (Kahn & Winton, 1998; Maug,1998)
- Stock price synchronicity inversely represents the reflection of firm-specific information
  - As firm-specific information is embedded more strongly in the stock price movement, stock price synchronicity falls (Morck, Yeung, & Yu, 2000)
- Institutional monitoring hinders negative information hoarding by firm managers, revealing more firm-specific information (An & Zhang, 2013; Dang et al., 2023)
- H_1: Stock price synchronicity is negatively associated with institutional ownership

Research background

- The effect of institutional monitoring remains controversial
  - A strand of studies suggest that institutional monitoring reduces firms' severe crash risk as negative information hoarding is deterred (An & Zhang, 2013; Hutton, Marcus, & Tehranian, 2009)
  - Another stand shows that crash risk increases with institutional ownership as firm managers reveal firm-specific bad information (Alp, Canbaloglu, & Gurgun, 2022 ; Huang, Tang, & Huang, 2020)
  - Some other studies suggest that firm managers may contrarily attempt to hide information against foreign institutions (Vo, 2020)
- While the effect on crash risk remains inconclusive, the latter views are often observed in emerging markets where information asymmetry is severer.
- H_2: Institutional ownership increases crash risk in the short run in an emerging market

Sample data

- KOSPI equity market
  - Firms: 768
  - Sample period: 2010-2022

Table 1. Summary statistics

	Mean	Std dev	Q1	Median	Q3
Synch	-1.757	1.463	-2.580	-1.619	-0.827
InstNB	-260,170	3,842,570	-296,105	-80	93,742
Inst	-0.005	0.041	-0.017	0.000	0.008
Roe	0.072	1.773	0.024	0.074	0.132
Mtb	0.001	0.006	0.000	0.001	0.001
Lsize	12.589	1.648	11.402	12.274	13.539
Lev	0.491	0.223	0.317	0.492	0.642
Skew	0.551	1.007	-0.046	0.395	0.992
Kurt	2.967	4.450	0.472	1.527	3.618
Vol	0.026	0.009	0.021	0.023	0.028
Count	-0.261	0.687	-1.000	0.000	0.000
Nskew	-0.551	1.007	-0.992	-0.395	0.046
DUvol	-0.254	0.416	-0.499	-0.224	0.019

Methodology

- Measuring synchronicity

$$r_{i,j,w} = \beta_0 + \beta_i r_{m,w} + \beta_{i,j} r_{j,w} + \varepsilon_{i,j,w}$$

  - $r_{i,j,w}$: weekly stock return of firm *i* in industry *j* at week *w*
  - $r_{m,w}$: KOSPI index return at week *w*
  - $r_{j,w}$: weekly industry return of industry *j* at week *w*
  - Weekly return is used to mitigate the spurious fluctuation of thinly traded stocks
  - All firms that went delisted or with substantial trading halts are excluded (Jin and Myers, 2006; Morck, Yeung, and Yu, 2000)
    - Excluded if less than 26 weeks over a fiscal year

- Stock price synchronicity

$$Synch_{i,t} = \ln\left(\frac{R_{i,t}^2}{1-R_{i,t}^2}\right)$$

Methodology

- Crash risk 1: Frequency of crashes (Count)
  - Number of stock return crashes beyond the number of jumps (Hutton, Marcus, and Tehranian, 2009; Jin and Myers, 2006)
  - Obtain residual from the following: $r_{i,j,w} = \beta_0 + \beta_i r_{m,w} + \beta_{i,j} r_{j,w} + \varepsilon_{i,j,w}$
  - Define firm-specific weekly return: $\ln(1 + \hat{\varepsilon}_{i,j,w})$
    - Jump: when firm-specific return is 3.09 SD above its mean (0.1% of *N*)
    - Crash: when firm-specific return is 3.09 SD below its mean (0.1% of *N*)
    - $Count_{i,t} = \#Crash_{i,t} - \#Jump_{i,t}$
- Negative conditional skewness (*NCSkew*)
  - Negative of the third central moment of firm-specific weekly return (Kim, Li, and Zhang, 2011a, 2011b)

Methodology

- Crash risk 2: Negative conditional skewness (*Nskew*)
  - Negative of the third central moment of firm-specific weekly return divided by its sample variance to the power of 1.5 (Kim, Li, and Zhang, 2011a, 2011b)

$$Nskew_{i,j,w} = \frac{-\left[n(n-1)^{\frac{3}{2}} \sum_{j=1}^{n} \left(r_{i,j,t}^{\varepsilon} - \overline{r^{\varepsilon}}_{i,t}\right)\right]}{(n-1)(n-2)\left(\sum_{j=1}^{n} \left(r_{i,j,t}^{\varepsilon} - \overline{r^{\varepsilon}}_{i,t}\right)^{2}\right)^{\frac{3}{2}}}$$

  - $r_{i,w,t}^{\varepsilon}$: firm-specific weekly return of firm *i* at week *j* in year *t*
  - $\overline{r^{\varepsilon}}_{i,t}$: average firm-specific weekly stock return of firm *i* in year *t*
  - The negative sign is added to make higher Nskew indicate higher crash risk

Methodology

- Crash risk 3: Down-to-up volatility (*DUvol*)
  - Ratio of return volatility during the Negative of the third central moment of firm-specific weekly return divided by its sample variance to the power of 1.5 (Chen, Hong, and Stein, 2001)
  - Standard deviation of *Up* and *Down* weeks
    - Down-week returns $r_{i,w,t}^{\varepsilon,d}$ when $r_{i,w,t}^{\varepsilon} < \overline{r^{\varepsilon}}_{i,t}$
    - Up-week returns $r_{i,w,t}^{\varepsilon,u}$ when $r_{i,w,t}^{\varepsilon} > \overline{r^{\varepsilon}}_{i,t}$
  - Log ratio of *Down*-week SD to *Up*-week SD

$$DUvol_{i,t} = \frac{\left[\frac{1}{n^d-1}\sum_{k=1}^{n^d}\left(r_{i,k,t}^{\varepsilon,d} - \overline{r^{\varepsilon}}_{i,t}\right)^2\right]^{\frac{1}{2}}}{\left[\frac{1}{n^u-1}\sum_{k=1}^{n^u}\left(r_{i,k,t}^{\varepsilon,u} - \overline{r^{\varepsilon}}_{i,t}\right)^2\right]^{\frac{1}{2}}}$$

Methodology

- Institutional trading and stock price synchronicity

$$Synch_{i,t} = \alpha + \beta_1 Inst_{i,t-1} + \beta_2 Roe_{i,t} + \beta_3 Mtb_{i,t-1} + \beta_4 Lsize_{i,t-1} + \beta_5 Lev_{i,t-1} + \beta_6 Skew_{i,t} + \beta_7 Kurt_{i,t} + \beta_8 Vol_{i,t} + \mu_i + \delta_t + \varepsilon_{i,t}$$

  - $Inst$: domestic institutional net buying scaled by end-year outstanding stocks
  - Roe: return on equity
  - Mtb: market-to-book value
  - $Lsize$: log market capitalizations
  - Lev: leverage ratio
  - $Skew$: skewness of firm-specific weekly returns
  - $Kurt$: kurtosis of firm-specific weekly returns
  - Vol: volatility of weekly industry returns

Methodology

- Institutional trading and crash risk

$$Crash_{i,t} = \alpha + \beta_1 Inst_{i,t-1} + \beta_2 Dturn_{i,t-1} + \beta_3 Nskew_{i,t-1} + \beta_4 Sigma_{i,t-1} + \beta_5 Ret_{i,t-1} + \beta_6 Roa_{i,t} + \beta_7 Lsize_{i,t-1} + \beta_8 Mtb_{i,t-1} + \beta_9 Lev_{i,t-1} + \mu_i + \delta_t + \varepsilon_{i,t}$$

where $Crash \in \{Count, Nskew, DUvol\}$

- $Dturn$: detrended turnover
- $Sigma$: standard deviation of firm-specific weekly returns
- Ret: mean of firm-specific weekly returns
- Roa: return on assets

Empirical findings

- Institutional ownership and stock price synchronicity

	(1)	(2)	(3)	(4)	(5)
Intercept	-6.815***	-8.204***	-6.316***	-4.903***	-4.903***
	(-62.09)	(-26.08)	(-50.97)	(-14.81)	(-12.51)
Inst_1	**-1.832*** **	**-2.071*** **	**-1.566*** **	**-1.681*** **	**-1.681*** **
	(-6.22)	**(-7.49)**	**(-5.42)**	**(-6.27)**	**(-6.16)**
Roe	0.002	0.002	0.003	0.004	0.004
	(0.24)	(0.26)	(0.37)	(0.56)	(0.72)
Mtb_1	-6.194***	-2.717	-6.482***	-2.193	-2.193
	(-2.75)	(-1.24)	(-2.99)	(-1.06)	(-0.36)
Lsize_1	0.274***	0.419***	0.252***	0.241***	0.241***
	(34.35)	(17.90)	(32.29)	(9.76)	(8.27)
Lev_1	0.380***	-0.392***	0.480***	-0.352***	-0.352**
	(6.59)	(-3.16)	(8.54)	(-2.99)	(-2.50)
Skew	-0.198***	-0.219***	-0.173***	-0.199***	-0.199***
	(-11.85)	(-13.55)	(-10.58)	(-12.77)	(-9.64)
Kurt	-0.019***	-0.009**	-0.027***	-0.017***	-0.017***
	(-4.96)	(-2.42)	(-7.26)	(-4.69)	(-3.73)
Vol	61.707***	58.663***	48.028***	11.624***	11.624***
	(42.47)	(40.51)	(17.63)	(3.03)	(2.88)
Firm FE	No	Yes	No	Yes	Yes
Year FE	No	No	Yes	Yes	Yes
Cluster	No	No	No	No	Yes
N	9,111	9,111	9,111	9,111	9,111
Within R^2	0.3182 (Adj)	0.2423	0.3670 (Adj)	0.3196	0.3196

Empirical findings

- Institutional ownership and stock price synchronicity

	Count	Nskew	DUvol
Intercept	-0.274***	-0.391***	-0.207***
	(-4.68)	(-4.49)	(-5.54)
Inst_1	**0.484*** **	**0.760*** **	**0.314*** **
	(2.69)	**(3.38)**	**(3.22)**
Dturn_1	0.061	0.246	-0.010
	(0.17)	(0.40)	(-0.04)
Nskew_1	-0.017	-0.067***	-0.018***
	(-1.94)	(-4.73)	(-3.13)
Sigma_1	0.065	-0.980	-0.213
	(0.14)	(-1.36)	(-0.75)
Ret_1	3.335***	3.547**	1.586**
	(3.25)	(2.33)	(2.49)
Roa	-0.760***	-0.777***	-0.444***
	(-4.64)	(-3.65)	(-4.84)
Lsize_1	0.000***	0.000	0.000
	(5.03)	(0.53)	(0.26)
Mtb_1	-0.799	-2.380	-1.047
	(-0.64)	(-1.34)	(-1.29)
Lev_1	0.015	-0.253	-0.094
	(0.17)	(-1.78)	(-1.46)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Cluster	Yes	Yes	Yes
N	9,091	9,091	9,091
Within R^2	0.0246	0.0362	0.0486

Robustness test

- Economic policy uncertainty as a confounder (Shen et al., 2021)

	(1)	(2)	(3)	(4)	(5)
Intercept	-7.372***	-7.452***	-7.117***	-5.855***	-5.855***
	(-66.35)	(-24.13)	(-45.33)	(-18.20)	(-15.58)
Inst_1	**-1.418*** **	**-1.612*** **	**-1.566*** **	**-1.681*** **	**-1.681*** **
	(-4.90)	**(-5.96)**	**(-5.42)**	**(-6.27)**	**(-6.16)**
Roe	0.004	0.004	0.003	0.004	0.004
	(0.52)	(0.65)	(0.37)	(0.56)	(0.72)
Mtb_1	-5.983***	-1.790	-6.482***	-2.193	-2.193
	(-2.71)	(-0.84)	(-2.99)	(-1.06)	(-0.36)
Lsize_1	0.260***	0.304***	0.252***	0.241***	0.241***
	(33.13)	(12.92)	(32.29)	(9.76)	(8.27)
Lev_1	0.444***	-0.345***	0.480***	-0.352***	-0.352**
	(7.86)	(-2.85)	(8.54)	(-2.99)	(-2.50)
Skew	-0.182***	-0.210***	-0.173***	-0.199***	-0.199***
	(-11.08)	(-13.28)	(-10.58)	(-12.77)	(-9.64)
Kurt	-0.023***	-0.012***	-0.027***	-0.017***	-0.017***
	(-6.24)	(-3.43)	(-7.26)	(-4.69)	(-3.73)
Vol	54.897***	51.129***	48.028***	11.624***	11.624***
	(37.50)	(35.06)	(17.63)	(3.03)	(2.88)
Epu	0.005***	0.005***	0.005***	0.006***	0.006***
	(19.77)	(20.71)	(10.06)	(12.59)	(11.98)
Firm FE	No	Yes	No	Yes	Yes
Year FE	No	No	Yes	Yes	Yes
Cluster	No	No	No	No	Yes
N	9,111	9,111	9,111	9,111	9,111
Within R^2	0.3462 (Adj)	0.2794	0.3670 (Adj)	0.3196	0.3196

Robustness test

- Economic policy uncertainty as a confounder (Shen et al., 2021)

	Count	Nskew	DUvol
Intercept	-0.259***	-0.633***	-0.378***
	(-2.93)	(-5.15)	(-7.19)
Inst_1	**0.484*** **	**0.760*** **	**0.314*** **
	(2.69)	**(3.38)**	**(3.22)**
Dturn_1	0.061	0.246	-0.010
	(0.17)	(0.40)	(-0.04)
Nskew_1	-0.017	-0.067***	-0.018***
	(-1.94)	(-4.73)	(-3.13)
Sigma_1	0.065	-0.980	-0.213
	(0.14)	(-1.36)	(-0.75)
Ret_1	3.335***	3.547**	1.586**
	(3.25)	(2.33)	(2.49)
Roa	-0.760***	-0.777***	-0.444***
	(-4.64)	(-3.65)	(-4.84)
Lsize_1	0.000***	0.000	0.000
	(5.03)	(0.53)	(0.26)
Mtb_1	-0.799	-2.380	-1.047
	(-0.64)	(-1.34)	(-1.29)
Lev_1	0.015	-0.253	-0.094
	(0.17)	(-1.78)	(-1.46)
Epu	-0.000	0.002***	0.001***
	(-0.32)	(3.91)	(6.35)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Cluster	Yes	Yes	Yes
N	9,091	9,091	9,091
Within R^2	0.0246	0.0362	0.0486

Robustness test

- Changes in the outstanding stocks
  - *Inst* is constructed based on the institutional net buying volume on an annual basis
  - A change in the number of the outstanding stocks (e.g., splits, buybacks, etc.) may influence the results
  - Robustness is tested after excluding any cases where the number of outstanding stocks change at least once during the year

Year	Increase	Decrease
2010	187	22
2011	181	17
2012	155	20
2013	157	25
2014	163	20
2015	178	18
2016	178	14
2017	179	27
2018	180	22
2019	166	12
2020	156	34
2021	193	19
2022	147	30

Robustness test

- Institutional ownership and stock price synchronicity after excluding obs with outstanding stock changes)

	(1)	(2)	(3)	(4)	(5)
Intercept	-6.769***	-8.902***	-6.230***	-5.099***	-5.099***
	(-53.39)	(-20.15)	(-43.37)	(-11.10)	(-9.31)
Inst_1	**-2.190*** **	**-2.574*** **	**-1.818*** **	**-2.112*** **	**-2.112*** **
	(-6.06)	**(-7.60)**	**(-5.13)**	**(-6.44)**	**(-7.05)**
Roe	-0.010	0.001	-0.007	0.002	0.002
	(-0.69)	(0.06)	(-0.47)	(0.16)	(0.12)
Mtb_1	-51.045***	-27.506	-54.605***	4.893	4.893
	(-4.97)	(-1.85)	(-5.52)	(0.34)	(0.21)
Lsize_1	0.272***	0.472***	0.250***	0.258***	0.258***
	(28.74)	(14.10)	(27.08)	(7.32)	(6.14)
Lev_1	0.540***	-0.221	0.632***	-0.171	-0.171
	(7.82)	(-1.26)	(9.41)	(-1.02)	(-0.80)
Skew	-0.246***	-0.264***	-0.217***	-0.241***	-0.241***
	(-12.29)	(-13.51)	(-11.06)	(-12.80)	(-10.52)
Kurt	-0.013***	-0.007	-0.023***	-0.015***	-0.015***
	(-2.82)	(-1.47)	(-4.98)	(-3.55)	(-2.83)
Vol	62.147***	59.698***	47.440***	10.536**	10.536**
	(37.11)	(35.48)	(15.04)	(2.36)	(2.17)
Epu	-6.769***	-8.902***	-6.230***	-5.099***	-5.099***
	(-53.39)	(-20.15)	(-43.37)	(-11.10)	(-9.31)
Firm FE	No	Yes	No	Yes	Yes
Year FE	No	No	Yes	Yes	Yes
Cluster	No	No	No	No	Yes
N	6,895	6,895	6,895	6,895	6,895
Within R^2	0.3242 (Adj)	0.2543	0.3742 (Adj)	0.3333	0.3333

Robustness test

- Institutional ownership and stock price synchronicity after excluding obs with outstanding stock changes)

	Count	Nskew	DUvol
Intercept	-0.334***	-0.505***	-0.221***
	(-4.80)	(-5.00)	(-5.28)
Inst_1	**0.474****	**0.751*****	**0.351*****
	(2.35)	**(2.96)**	**(3.12)**
Dturn_1	0.229	0.900	0.284
	(0.44)	(1.11)	(0.93)
Nskew_1	-0.012	-0.065***	-0.016**
	(-1.09)	(-3.92)	(-2.41)
Sigma_1	0.040	-0.376	-0.062
	(0.07)	(-0.47)	(-0.19)
Ret_1	2.779	-0.648	-0.080
	(1.93)	(-0.34)	(-0.10)
Roa	-0.704***	-0.920***	-0.586***
	(-3.15)	(-3.01)	(-4.41)
Lsize_1	0.000***	0.000	0.000
	(5.70)	(0.40)	(0.13)
Mtb_1	34.898	65.864**	33.417**
	(1.23)	(1.98)	(2.41)
Lev_1	0.043	-0.153	-0.104
	(0.38)	(-0.92)	(-1.53)
Epu	-0.334***	-0.505***	-0.221***
	(-4.80)	(-5.00)	(-5.28)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Cluster	Yes	Yes	Yes
N	6,884	6,884	6,884
Within R^2	0.0300	0.0508	0.0676

Channel test

- Sample test with investor sentiment (Baker & Wurgler, 2006)

	Sent_1	Count	Count	Nskew	Nskew	DUvol	DUvol
Intercept	-1.831***	-2.398***	-2.500***	-4.480***	-4.703***	-2.076***	-2.149***
	(-9.48)	(-10.88)	(-8.18)	(-12.85)	(-10.25)	(-13.85)	(-11.04)
Inst_1	**0.359*** **	**0.351* **	**0.112**	**0.503** **	**0.422**	**0.197* **	**0.134**
	(3.34)	**(1.92)**	**(0.47)**	**(2.17)**	**(1.30)**	**(1.94)**	**(0.99)**
Sent_1			**0.017**		**0.102* **		**0.051** **
			(0.44)		**(1.80)**		**(2.27)**
Dturn_1	0.443	0.226	0.353	0.568	0.241	0.137	-0.024
	(1.10)	(0.60)	(0.67)	(0.92)	(0.30)	(0.57)	(-0.07)
Nskew_1	0.025***	-0.023**	-0.024*****	-0.078***	-0.081***	-0.023***	-0.023***
	(2.93)	(-2.58)	(-2.09)	(-5.53)	(-4.58)	(-4.01)	(-3.19)
Sigma_1	0.709	-0.229	-0.474	-1.525**	-1.417	-0.462	-0.449
	(1.36)	(-0.50)	(-0.78)	(-2.12)	(-1.51)	(-1.63)	(-1.22)
Ret_1	18.330***	0.453	-0.050	-2.110	-4.615*	-1.003	-2.245**
	(10.93)	(0.43)	(-0.03)	(-1.33)	(-1.75)	(-1.49)	(-2.05)
Roa	0.359***	-0.822***	-0.694***	-0.896***	-0.813***	-0.498***	-0.428***
	(3.91)	(-5.12)	(-3.32)	(-4.12)	(-2.93)	(-5.26)	(-3.49)
Lsize_1	0.118***	0.171***	0.177***	0.329***	0.341***	0.150***	0.154***
	(7.00)	(10.03)	(7.55)	(11.98)	(9.72)	(13.11)	(10.59)
Mtb_1	-0.455**	-1.549**	-1.572**	-3.870*	-4.135*	-1.729*	-1.809*
	(-1.97)	(-2.10)	(-2.05)	(-1.84)	(-1.87)	(-1.66)	(-1.72)
Lev_1	-0.051	0.153*	0.241**	0.013	0.089	0.028	0.068
	(-1.07)	(1.81)	(2.20)	(0.11)	(0.59)	(0.49)	(0.92)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5,598	9,091	5,598	9,091	5,598	9,089	5,598
Within-R^2	0.428	0.037	0.038	0.059	0.061	0.076	0.077

Remarks

- Domestic institutional ownership reinforces monitoring over the firm managers, resulting in lower synchronicity
- As negative information hoarding becomes less likely, the short-term firm-specific crash risk increases
- The findings remain qualitatively unchanged after considering potential confounders such as economic policy uncertainty and the changes in the number of outstanding stocks
- Investor sentiment partially mediates the effect of institutional trading on firms' crash risk

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