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SME's and the Pandemic: Evidence From Three Major Asian Powers

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The paper examines the nexus between COVID-19-induced anxiety and the performance of SME stocks in China, India, and Japan. The performance of SME stocks is measured using the index which tracks the SME Exchange in each country. We use daily data on the number of COVID-19 cases and deaths to construct our anxiety index. Our findings suggest that the pandemic does not have a significant impact on the performance of SME stocks.

I. Introduction

COVID-19, which was first detected in December 2019 in Wuhan, China, has spread across the globe. The World Health Organization (WHO) declared COVID-19 a global pandemic on March 11th, 2020. Globally, there have been over 600 million confirmed cases of COVID-19 (WHO, 2020). The economic ramifications of the pandemic have been grave and are said to have triggered the largest global economic crisis in more than a century (World Bank, 2022). Lockdowns and restrictions on movements imposed across the globe to combat the spread of COVID-19 have adversely affected all sectors of the economy. One of the most severely hit sectors is small and medium-sized enterprises (SMEs) (Kalemli-Ozcan et al., 2020).

On one hand, there are several studies that have examined the impact of COVID-19 on SMEs (Gourinchas et al., 2021; Kaya, 2022; Thorgren & Williams, 2020). It is argued that the impact of COVID-19 is more pronounced for small businesses and self-employed individuals (UNCTAD, 2022).[1] On the other hand, empirical literature documents the influence of COVID-19-related sentiment on the stock market (John & Li, 2021; Sharma, 2020; Smales, 2021; Sun et al., 2021). However, there is a dearth of studies that examine the impact of COVID-19-related sentiment on SME stocks. This study intends to fill this gap in the literature by examining the impact of COVID-19-induced anxiety on the performance of SME stocks.

Our study is based on the countries comprising Asia's strategic triangle (i.e., China, India, and Japan). The SME sector is a major contributor to the socio-economic development in these countries. On the employment front, SMEs account for 80%, 50% and 70% of national employment in China, India, and Japan respectively. It also generates over 50% of national value added in these countries. Moreover, these countries have dedicated SME exchanges/ platforms associated with the Main Exchange – ChiNext in China, NSE SME Emerge in India, and JASDAQ in Japan. The SME exchanges are designed to facilitate SME fundraising processes while at the same time protecting investors' interests.

For the purpose of our analysis, we use the stock market index which traces the movement in the SME exchanges. Specifically, we track the performance of Chinese SME stocks by tracking the performance of ChiNext Index, Nifty SME Emerge Index and JASDAQ 20 for China, India, and Japan respectively. Furthermore, for the purpose of measuring anxiety, we construct an anxiety index following Yu et al. (2022) using the daily statistics of COVID-19 cases and deaths in each of the countries.

While we expected to observe a significant negative relation between pandemic-related anxiety and SME stock performance, our country-wise analysis suggests otherwise. Our results suggests that no significant relationship exists between pandemic-induced anxiety and the performance of SME stocks. Evidence of the existence of a negative and significant impact between the two is found only for Japanese SME stocks.

The study adds to the existing literature in the following ways. First, by examining the nexus between the performance of SME stocks and COVID-19-related anxiety, we add to the literature that examines SMEs in light of the pandemic (Caballero-Morales, 2021; Pedauga et al., 2022; H. Zhang et al., 2023). Second, we contribute to behavioral finance literature which examines the impact of investor sentiment on asset market (Aouadi et al., 2013; Fisher & Statman, 2000; Huerta & Perez-Liston, 2011). Finally, we add to the literature that examines the impact of pandemics

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1 United Nations Conference on Trade and Development

on an economy (Donadelli et al., 2017; Gupta et al., 2021; Schell et al., 2020).

The remainder of this paper is organized as follows. Section II explains the data and variables used in the study. Section III presents our empirical results and discussions. Section IV concludes the study.

II. Data and Variables

To examine the impact of the Pandemic on SMEs, we evaluate the performance of SME stocks in China, India, and Japan over the period of January 2020 to September 2022. China, India, and Japan have dedicated exchanges for the SMEs. An SME exchange/SME platform of Main exchanges is set up with the intention to improve access to funds for the SMEs. ChiNext, NSE Emerge and JASDAQ are the SME exchanges in China, India, and Japan respectively. We use the index that tracks the stocks listed on these SME Exchanges (ChiNext Index, Nifty SME Emerge Index and JASDAQ 20) for our study and obtain data from *Investing.com*.[2]

We construct two alternative anxiety indices (AI), following Yu et al. (2022), to measure pandemic-related sentiment. The indices are based on the daily COVID-19 cases and deaths reported in each country. Data pertaining to country specific COVID-19 cases and deaths are obtained from the WHO Coronavirus (COVID-19) Dashboard. The first measure, COVID-19 Anxiety Index (*CAI*), is constructed following Equation (1). The second index, called COVID-19 Rolling Anxiety Index (*CRAI*) is constructed based on the cases and deaths reported over the 14-day incubation period following Equation (2).

$$CAI_t = 0.5\left[\frac{C_t}{C_t + C_{t-14}} + \frac{D_t}{D_t + D_{t-14}}\right] \quad (1)$$

$$CRAI_t = 0.5\left[\frac{\sum_{k=1}^{14} C_{t-14+k}}{\sum_{k=0}^{13} C_{t-14+k}} + \frac{\sum_{k=1}^{14} D_{t-14+k}}{\sum_{k=0}^{13} D_{t-14+k}}\right] \quad (2)$$

where C_t and D_t represent the number of COVID-19 cases and deaths respectively, reported on day *t*. C_{t-14} and D_{t-14} captures the number of cases and deaths reported 14 days prior, i.e., at the beginning of the incubation period. The second index, $\sum_{k=1}^{14} C_{t-14+k}$ and $\sum_{k=1}^{14} D_{t-14+k}$ are the total number of cases and deaths reported over the 14-day incubation period, respectively. $\sum_{k=0}^{13} C_{t-14+k}$ and $\sum_{k=0}^{13} D_{t-14+k}$ represent the same during the previous incubation period. The indices are computed separately for each of the three countries in our sample.

Table 1 reports country-wise descriptive statistics for the variables used in the study. Index returns are calculated as ratio of log of current and previous closing index value. The mean returns for India and Japan are marginally negative, hinting at a possible negative impact of the pandemic on their SME stocks. Interestingly, China, the epicenter of COVID-19 has a marginally positive mean return. In line with the case for returns, the mean value of *CAI* is also lower in China when compared to India and Japan.

III. Empirical Results and Discussion

We examine the impact of pandemic-related anxiety on SME stocks. Given the large body of empirical evidence documenting a negative impact of COVID-19-related sentiment on financial markets (Haroon & Rizvi, 2020; Hasan, 2022; Huynh et al., 2021; Lyócsa et al., 2020; Smales, 2021), we expect anxiety to have a negative impact on the returns. For our analysis, we employ the time series regression technique. This allows us to capture the impact of COVID-19-related anxiety in China, India, and Japan distinctively. In this regard, we estimate the following model separately for each country:

$$R_t = \alpha + \beta AI_{t-1} + Controls + \varepsilon_t \quad (3)$$

where R_t is the daily Index return at time *t* and AI_{t-1} is the lagged value of anxiety index. We control for past index returns, day of the week dummies and month dummies. We expect the coefficient of AI_{t-1} to be negative.

The estimation results are presented in Table 2, with each panel corresponding to one of the countries in the sample. As already noted, we use two alternative measures of *AI*. Columns 1 and 2 report the estimation results using *CAI* and *CRAI* respectively as the measures of pandemic-related anxiety. Contrary to the widely documented negative impact of COVID-19 on financial markets, we observe that COVID-19-related anxiety does not have any significant impact on the three countries considered in our study.[3]

Columns 3 and 4 re-examine the relationship between pandemic-related anxiety and returns after controlling for SME index and the main market index returns on the previous day. In addition, we also control for *GDP growth* rate to take into account the prevailing macroeconomic conditions. Past return has a positive and significant effect on SME stocks only in the case of India. Weak evidence of significance of past returns is observed in the case of China as well. Similarly, performance of the stocks listed on the Main Exchange is observed to have a significant impact on the returns for SME stocks in the case of India and China. Contrary to our expectation, *AI* continues to be insignificant. Our results suggest that, on average, pandemic-induced anxiety did not have any impact on the returns of stocks

2 Investing.com is one of the top three global financial websites in the world that offers market quotes, information about stocks, indices futures, options, analysis, and commodities for over 250 stock exchanges around the world. The database is widely used by previous studies (Chundakkadan & Nedumparambil, 2021; D. Zhang et al., 2020)

3 We also examine the relationship between pandemic-related anxiety and performance of SME stocks using a panel regression technique (for robustness) and observe that our results remain qualitatively similar. The results are not reported for brevity [i.e., to keep the paper brief].

Table 1. Descriptive Statistics

Variable	Mean	Std.Dev.	Min	Max
		China		
Index Return	0.001	0.019	-0.069	0.055
CAI	0.427	0.231	0	1
CRAI	0.010	0.002	0.004	0.022
		India		
Index Return	-0.001	0.014	-0.100	0.085
CAI	0.495	0.169	0	1
CRAI	0.010	0.003	-0.005	0.052
		Japan		
Index Return	-0.001	0.015	-0.071	0.069
CAI	0.504	0.174	0	1
CRAI	0.010	0.001	0.004	0.015

This table provides country-wise descriptive statistics of index returns and the anxiety indices. Index return is the return for SME specific indices namely, ChiNext index, Nifty SME Emerge index, and JASDAQ20 for China, India, and Japan, respectively. COVID-19 anxiety index (*CAI*) and the COVID-19 rolling anxiety index (*CRAI*) are the pandemic related anxiety indices constructed using the daily reported cases and deaths in each country.

listed on the SME exchange/platforms in India, China, and Japan.[4]

Further, we control for the day-of-the-week effect and month-specific effect by including dummy variables for the day of the week and the month as additional control variables. The results from our analysis are presented in Columns 5 and 6. The results remain quantitatively and qualitatively similar. To conclude, we do not observe any significant relation between COVID-19 related anxiety and returns for the SME stock listed on ChiNext, NSE Emerge, and JASDAQ.

Overall, the results contradict the general consensus pertaining to the impact of COVID-19 on financial market. We observe that there is no significant impact of COVID-19-related anxiety on stock returns. SME exchange/platforms are specifically designed to support SMEs. The listing requirements and nature of the stocks listed on SME platforms are different from those in the Main Exchange. SME markets have relatively low liquidity (Harwood & Konidaris, 2015). Moreover, companies on SME exchange are smaller companies with relatively shorter operating history. Our results could be driven by the fact that SME stocks are riskier than the stocks listed on the Main Exchange. We conjecture that the risky nature of SME stocks discourages less informed investors from trading and thus limits sentiment-driven trades.

IV. Conclusion

This paper seeks insights on the nexus between COVID-19-induced anxiety and returns on stock listed on specialized exchanges/platforms meant for SMEs. Our study is based on three major Asian economies which have dedicated exchanges for SMEs, i.e., China, India, and Japan. We construct our anxiety indices using the reported COVID-19 cases and deaths. Our analysis involves examining the impact of pandemic-related anxiety on SME-specific stock indices (ChiNext Index, Nifty SME Emerge Index, and JASDAQ 20) over the period from January 2020 to September 2022.

Results of empirical tests suggest that returns for SME stocks are unaffected by pandemic-induced anxiety in the three countries considered in this study. The results suggest that the regulations governing SME exchange has limited sentiment-driven trades. Individual stock level analysis, as opposed to an index level analysis, carried out in our study, would present a more nuanced picture of the relation between anxiety and returns in SME segment.

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4 As an additional robustness check we analyse the impact of COVID-19-related anxiety on SME stocks using the COVID-19 Index prepared by Narayan et al. (2021). The results corroborate our findings and suggest that COVID-19-related anxiety did not have a significant impact on SME stocks.

Table 2. Anxiety Index and SME Returns

Variables	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: China			
CAI_{t-1}	0.001		0.001		0.001	
	(0.004)		(0.004)		(0.004)	
$CRAI_{t-1}$		0.205		0.085		0.179
		(0.365)		(0.367)		(0.395)
$Return_{t-1}$			0.260*	0.259*	0.233	0.229
			(0.142)	(0.142)	(0.142)	(0.143)
$Index\ Return_{t-1}$			−0.386**	−0.384**	−0.369**	−0.363*
			(0.187)	(0.188)	(0.187)	(0.188)
GDP Growth			−0.001	−0.001	−0.001	−0.001
			(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.001	−.002	0.001	−0.001	−0.003	−0.005
	(0.002)	(0.003)	(0.002)	(0.004)	(0.004)	(0.005)
DoW Dummies	No	No	No	No	Yes	Yes
Month Dummies	No	No	No	No	Yes	Yes
Observations	530	530	517	517	517	517
R-squared	0.001	0.001	0.015	0.015	0.046	0.046
			Panel B: India			
CAI_{t-1}	0.004		0.003		0.001	
	(0.005)		(0.004)		(0.005)	
$CRAI_{t-1}$		0.048		−0.046		−0.109
		(0.218)		(0.196)		(0.193)
$Return_{t-1}$			0.248***	0.251***	0.245***	0.246***
			(0.073)	(0.074)	(0.076)	(0.076)
$Index\ Return_{t-1}$			−0.187*	−0.188*	−0.199*	−0.199*
			(0.103)	(0.106)	(0.104)	(0.105)
GDP Growth			−0.001	−0.001	−0.001	−0.001
			(0.001)	(0.001)	(0.001)	(0.001)
Constant	−0.002	−0.001	−0.001	0.001	−0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
DoW Dummies	No	No	No	No	Yes	Yes
Month Dummies	No	No	No	No	Yes	Yes
Observations	563	563	542	542	542	542
$R-$squared	0.003	0.001	0.056	0.055	0.087	0.088
			Panel C: Japan			
CAI_{t-1}	0.001		0.001		0.001	
	(0.004)		(0.004)		(0.005)	
$CRAI_{t-1}$		−0.436		−0.291		−0.854
		(0.422)		(0.458)		(0.522)
$Return_{t-1}$			0.008	0.008	0.011	0.019
			(0.075)	(0.074)	(0.075)	(0.074)
$Index\ Return_{t-1}$			0.072	0.070	0.072	0.071
			(0.101)	(0.101)	(0.102)	(0.102)
GDP Growth			−0.001	−0.001	−0.001	−0.001
			(0.001)	(0.001)	(0.001)	(0.001)
Constant	−0.001	0.004	−0.001	0.003	−0.003	0.004
	(0.002)	(0.004)	(0.002)	(0.004)	(0.003)	(0.005)

DoW Dummies	No	No	No	No	Yes	Yes
Month Dummies	No	No	No	No	Yes	Yes
Observations	542	542	515	515	515	515
R-squared	0.001	0.002	0.008	0.009	0.037	0.044

This table presents results obtained from Equation (3) which examines the relationship between the pandemic related anxiety on SME stocks. COVID-19 anxiety index (*CAI*) and the COVID-19 rolling anxiety index (*CRAI*) are the pandemic related anxiety indices constructed using the daily reported cases and deaths in each country. *DoW Dummies* and *Month Dummies* are dummy variables capturing day-of-the-week and month, respectively. Robust standard errors are reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

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