



COVID-19 and stock market performance: Evidence from the RCEP countries[☆]

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ABSTRACT

As the world's largest trading bloc, the agreement of RCEP, which was formalized in September 2020, is believed to play a non-neglectable role in the post-pandemic recovery. Real economies and the capital markets of the participating countries will have greater interactions due to tariff reduction and negative lists. By looking into the shocks in early 2020 that affect the stock markets of RCEP participating countries, we measure the stock market reaction to common risks just before the RCEP agreement was formalized. Following return-based, volume-based and liquidity-based event-study approaches, we use daily data from 11 Asia-Pacific countries to examine the stock market reactions. We find that RCEP economies for which the agreement took effect on January 1st, 2022 showed better risk resistance in response to COVID-19 shocks. In the long run, trading benefits brought by the RCEP agreement are expected to form and strengthen a system of circular flow of international trading activities among the participating countries, which will in turn increase the risk resistance ability of their stock markets.

1. Introduction

As the consecutive emergence of COVID-19 vaccines led people to expect a post-pandemic world, the financial sectors worldwide have witnessed unprecedented multi-level uncertainties shocking the markets (Pan et al., 2021; Zaheer et al., 2022). Following the outbreak of confirmed cases in Wuhan in December 2019, most countries in the Asia-Pacific region got their first case confirmed in January or February 2020. As the confirmed cases continued to rise worldwide, WHO officially declared the event as a pandemic on March 11, 2020. Meanwhile, the U.S. stock market witnessed a big crash and entered into a temporary bear market in March 2020. Measures were taken in countries, in terms of travel restrictions, quarantine rules, and monetary or fiscal policies, to hedge the contagion and the amplifying socio-economic shocks. The end of 2019 is not only the beginning of the COVID-19 outbreak, but also a point at which the participating countries of RCEP determine to finalize their negotiations towards a formal agreement. With the fast

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contagion of the Covid-19 pandemic globally, the agreement wasn't formalized until Nov 15th, 2020. On Jan 1st, 2022, the agreement formally took effect for 7 out of 11 participating countries: Australia, China, Japan, New Zealand, Singapore, Thailand, and Viet Nam. RCEP is now the world's largest trading bloc, and it's believed to play a non-neglectable role in the post-pandemic recovery. The participating countries covered 47.4% of the global population, 32.2% of the global economy, 29.1% of global trade, and 32.5% of global investment flows in 2018.

As the world's largest trading bloc, whether the capital markets of RCEP countries are able to jointly withstand risks is crucial to the post-pandemic recovery of the global economy. However, these questions have not been answered. The real economies and the capital markets of the participating countries are believed to have much greater interactions once the tariff reduction and negative lists are formally carried out, and there will be increasingly close and complex interdependencies of the social activities among the countries. However, as it usually takes longer periods for trading activity plans to take effect due to contract rigidity, etc., this study mainly aims to provide a perspective of the status-quo of the RCEP participating countries' capital market reactions to exogenous shocks prior to the time of the formalization of the RCEP agreement. In other words, we focus on tackling with the short-term, capital-driven performance responses to the COVID-19, while the longer-term, fundamentally driven stock market performance remains to be validated at the industrial- and firm-level once the changes in production and trading activities are realized in the future.

Moreover, though some studies have already examined the stock market response to Covid-19 (Harjoto, Agus, Rossi, John, & Paglia, 2020; He, Liu, et al., 2020 (b); Liu et al., 2020; Rahman, Amin, & Al Mamun, 2021; Mezghani et al., 2021; Yan & Qian, 2020), it hasn't been done on RCEP countries. In this paper, using return-based (Krüger, 2015; Loipersberger, 2018), volume-based (Sanders and Zdanowicz, 1992) and liquidity-based approaches of event study, we measure the stock market reactions to common risks just before the RCEP agreement was formalized, by estimating the cumulative abnormal return, trading volume and illiquidity growth rate of multiple common events of the daily stock market returns of 11 RCEP countries. We find that RCEP economies for which the agreement took effect on January 1st 2022 showed better risk resistance in response to announcement of emergence of each coronavirus variant and to the FED stimulus package brought forward in the early stage of the pandemic. RCEP participating economies with the agreement effective tend to experience smaller magnitude of abnormal stock market returns, trading volume growths, and illiquidity growths. In the long run, trading benefits brought by the RCEP agreement are expected to form and strengthen a system of circular flow of international trading activities among the participating countries, which will in turn enhance the risk resistance ability of their stock markets.

The remainder of the paper is structured as follows: Section 2 presents the literature review. Section 3 presents the data and the methodology. Section 4 describes our major results and findings. Section 5 makes a conclusion.

2. Literature review

We describe the literature in the following three dimensions.

2.1. Impact of Covid-19 and its related events on asset markets

Goodell (2020), in his agenda study, highlights that the pandemic is to cause unparalleled damages on global economies, including stock markets. Studies on stock market responses have found consistent negative impacts of the COVID-19 and positive impacts of government responses on market-level indexes and individual firm stock performances (Harjoto et al., 2020; He, Liu, et al., 2020 (b); Liu et al., 2020; Rahman et al., 2021; Yan & Qian, 2020; Ashraf, 2020; Baek et al., 2020; Capelle-Blancard & Desroziers, 2020; Ciner, 2021; Contessi & De Pace, 2021; Cox & GreenwaldLudvigson, 2021; He, Liu, et al., 2020 (a); Khan et al., 2020; Narayan, Dinh, & Liu, 2021; Onali, 2020; Ftiti et al., 2021; Marobhe & Kansheba, 2022).

In addressing the impact on stock market performance, some studies adopt event studies markets (Chiang, T.C., 2021; Harjoto et al., 2020; He, Liu, et al., 2020 (b); Liu et al., 2020; Nguyen et al., 2021; Rahman et al., 2021; Xie et al., 2021; Yan & Qian, 2020), many other research works adopt time series models and traditional panel or cross-sectional models to examine the problem (Ashraf, 2020; Baek et al., 2020; Capelle-Blancard & Desroziers, 2020; Ciner, 2021; Contessi & De Pace, 2021; Cox & GreenwaldLudvigson, 2021; He, Liu, et al., 2020 (a); Khan et al., 2020; Narayan et al., 2021; Onali, 2020; Ramelli & Wagner, 2020), and some studies also use non-parametric methods to facilitate estimation and model selection, such as wavelet framework, detrended moving cross-correlation analysis, quantile regression, and Mann–Whitney tests (Matos et al., 2021; Okorie & Lin, 2021; Kizys et al., 2021; He, Liu, et al., 2020 (a); Ftiti et al., 2021).

Some studies also look into the responses of derivative market, commodity market and money market. Daehler et al. (2021), with data of the last 6 years, find that the cumulative Covid-19 mortality rate growth is positively associated with the emerging markets sovereign CDS spreads. Akhtaruzzaman et al. (2021) analyze high frequency data and find that gold served as a safe-haven asset for stock markets during the early stage of the pandemic, but lost its safe-haven role when the situation continued to worsen after March 17, 2020. Burdekin and Ran (2021) also find that gold provided strong hedging value during the global financial crisis but did not consistently exhibit this property in 2020.

2.2. Regional stock market co-movement and free trade agreement

As our research question is aimed at the multiple countries, we also take a look at how the question of the international stock market co-movement has been addressed previously. Kang, Ratti, and Vespignani (2021) decompose global stock market volatility shocks into financial originated shocks and nonfinancial originated shocks, and find that global stock market volatility shocks that

arise from financial sources reduce global outputs and inflation substantially more than shocks from nonfinancial sources. BenMim and Ahmed, 2019 employs a regular vine copula approach to model the dependence dynamics between major American and European stock markets by distinguishing the effects during crisis periods and tranquility periods, and find strong evidence of financial contagion with the Eurozone at its origin. Ahmed and Huo (2019) examines the price and volatility dynamics between China and major stock markets in the Asia-Pacific, and find that price spillovers from China are more significant than most of the other AP countries, during both bullish and bearish periods, and they also find that China is becoming more integrated with the regional financial markets. Dong and Yoon (2019) explores the global economic factors that significantly impact on emerging Asian stock market returns, and find that developed stock and exchange rate markets show a strong relationship with emerging Asian stock markets due to financial market integration.

Moreover, we briefly summarize how the literature has addressed the FTA-related problems. Li et al. (2017) investigate the potential effect of RCEP on foreign direct investment (FDI) with a focus on China using an innovative computable general equilibrium (CGE) model, and their simulation results suggest that RCEP would encourage significant increases in FDI to China through both these pathways. Balistreri and Tarr (2020) develop a new numerical model of foreign direct investment (FDI) with heterogeneous firms and extension of the Krugman model, and find that there are substantial gains from deep integration, but virtually no gains from preferential tariff reduction.

2.3. Covid-19 and its socio-economic interlinkages

COVID-19 as a pandemic has very complex socio-economic interlinkages with events from multiple dimensions. Baker et al., 2020 uses text-based methods to re-view the effect of previous pandemics to the society and stock markets, and it suggests that government restrictions on commercial activity and voluntary social distancing, operating with powerful effects in a service-oriented economy, are the main reasons the U.S. stock market reacted so much more forcefully to COVID-19 than to previous pandemics. Phan and Paresh Kumar (2020) argues that, as with any unexpected news, markets over-react and as more information becomes available and people understand the ramifications more broadly the market corrects itself. Altig et al. (2020) estimated different times of economic un-certainty indicators: implied stock market volatility, newspaper-based policy uncertainty, Twitter chatter about economic un-certainty, subjective uncertainty about business growth, forecaster disagreement about future GDP growth, and a model-based measure of macro uncertainty, and finds that all indicators show huge uncertainty jumps in reaction to the pandemic and its economic fallout. There is also research using dynamic asset pricing model to identify the fluctuations in stock market risk pricing, and it finds that the unprecedented steps of Fed play a role in the fluctuations, as well as that the market movements during COVID-19 have been more reflective of sentiment than substance (Cox & GreenwaldLudvigson, 2021).

We contribute to the existing literature from several perspectives. First, we fill a gap in the literature on the impact of COVID-19 on capital markets. To the best of our knowledge, we are the first to compare and integrate the impact of COVID-19 on the stock market return of RCEP markets through return-, trading volume- and liquidity-based event studies. Second, our results suggest that emerging RCEP stock markets showed less market efficiency and more dominance by international floating capital, the highly volatile performance pattern is expected to be stabilized if there is a robust circular-flow trading system among the RCEP countries. We recognize that the RCEP's relaxation of market access and the elimination of tariffs will deepen the cooperation among countries and improved the ability of participating countries' capital markets to withstand risks.

3. Empirical strategy and data

3.1. Empirical strategy

3.1.1. Event study

The method of a return-based event study is first proposed systematically by Fama et al. (1969) According to the theory of the event study method, when an efficient market hypothesis is valid, the influence of a particular event will be reflected in the change of stock price, to explain the effect on the return of stocks and reaction to information disclosure. Therefore, the event study method is widely used in economics and finance empirical studies to identify the impact of specific events. For instance, Wang, Yang, and Chen (2013) investigated how outbreaks of infectious diseases affected the performance of biotechnology stocks, showing that Chinese Taiwan's biotechnology industry had significant abnormal returns due to statutory infectious diseases.

The return-based event-study follows Krüger (2015) and Loipersberger (2018), and our volume-based event-study follows Ajinkya and Jain (1989) and Sanders and Zdanowicz (1992). We use a 250-day estimation window, and we consider both the $(-5, 5)$ and $(-10, 10)$ event window.

We take eight events into our consideration.

The first event is on Jan. 30th, 2020, when the WHO declared that the outbreak in China and other 20 countries constitute a Public Health Emergency of International Concern.

The second event is on March 11th, 2020, when the WHO declared the global pandemic of Covid-19.

The third event is on April 9th, 2020, when the Fed provided a \$2.3 million stimulus in loans and credit. We measure a stock market reaction by both estimating cumulative abnormal return and cumulative abnormal growth in volume. The estimation and prediction process are outlined below.

The fourth to seventh events capture when the WHO announced a new variant of concern of the coronavirus: Variants Alpha and Beta on 2020 Dec. 18th; Variant Gamma on 2021 Jan. 1st; Variant Delta on 2021 April 4th; Variant Omicron on 2021 Nov. 24th.

Table 1
Sampling stock market indexes.

Country	Stock Index	Developed economy	Agreement signed (15th Nov 2021)	Effective (1st Jan 2022)
Australia	ASX 300 Index	Yes	Yes	Yes
China	Shanghai Composite Index	No	Yes	Yes
Japan	Nikkei 225 Index	Yes	Yes	Yes
New Zealand	NZX 50 Index	Yes	Yes	Yes
Singapore	STI Index	Yes	Yes	Yes
Thailand	SET Index	No	Yes	Yes
Vietnam	VN Index	No	Yes	Yes
Indonesia	Jakarta Composite Index	No	Yes	No
South Korea	KOSPI 50 Index	Yes	Yes	No
Malaysia	FTSE KLCI	No	Yes	No
Philippines	PSEi Composite Index	No	Yes	No
India	BSE Sensex Index	No	No	No
Asia-Pacific region	FTSE Asia Pacific Index			

Note: This table presents the stock market information included in the paper.

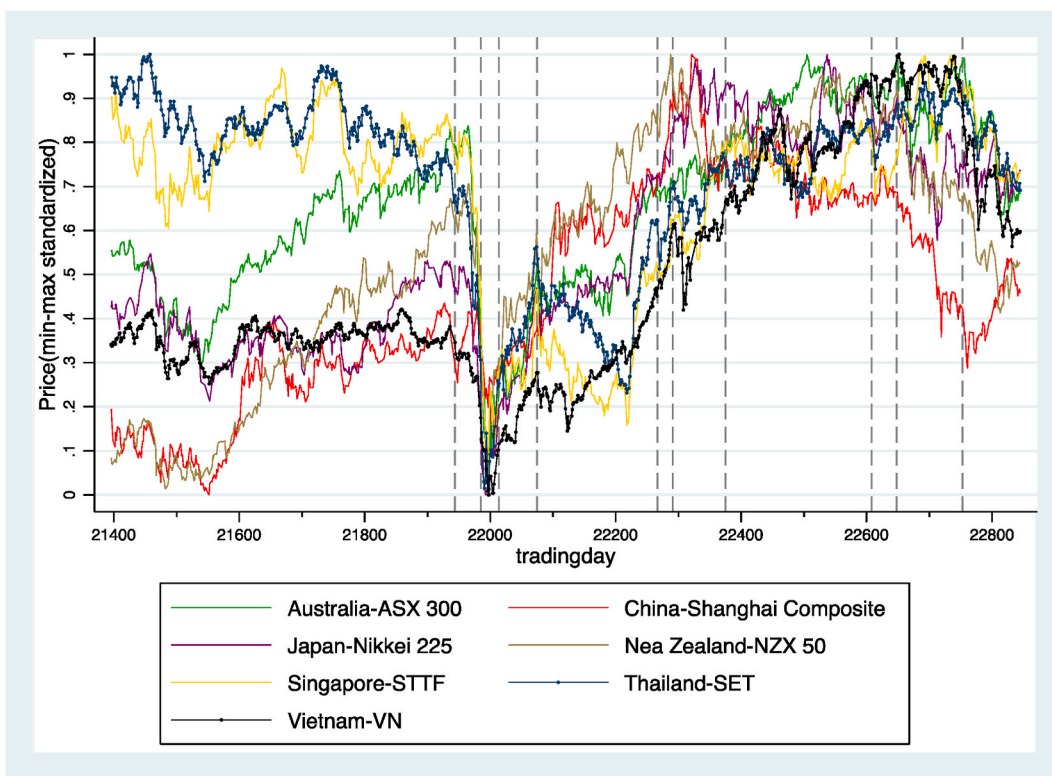


Fig. 1. Normalized index prices over the event period.

The eighth event is when the WHO announced the spreading of children hepatitis on 2022 April. 15th.

We measure a stock market reaction by both estimating cumulative abnormal return and cumulative abnormal growth in volume. The estimation and prediction process are outlined below.

$$R_{i,t} = \alpha_i + \beta_i R_{i,M,t} + \varepsilon_{i,t} \tag{1}$$

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{i,M,t}) \tag{2}$$

$$CAR_{i(t_1,t_2)} = \sum_{t_1}^{t_2} AR_{i,t} \tag{3}$$

$$AAR_t = \frac{1}{I} \sum_{i=1}^I AR_{i,t} \tag{4}$$

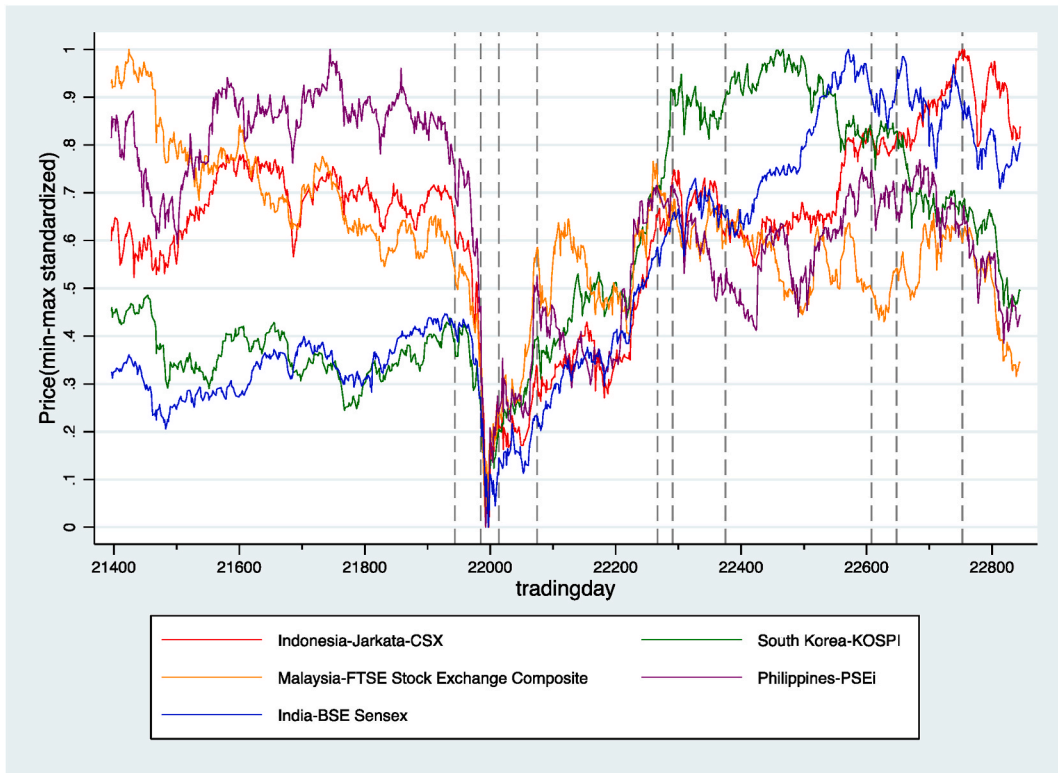


Fig. 2. Normalized index prices over the event period (continued).

Equation (3) characterized how the coefficients of normal return about the total market is estimated. $R_{i,t}$ is the representative stock index of market i and date t , and $R_{i,M,t}$ is the stock index of the representative performance of all the sampling markets. Formula (4) describes that the average abnormal return is calculated by taking an average of the countries' abnormal return of some trading day, where AAR_t is the mean of AR_{it} over I_t countries (regions) on date t .

The volume-based event study is constructed as follows:

$$V_{j,t} = \ln(\text{Volume}_{j,t}) \tag{5}$$

$$gV_{j,t} \approx V_{j,t} - V_{j,t-1} \tag{6}$$

We do a log-difference transformation to the trading volume, and use the approximated change rate of trading volume to do the AR (1) estimation below. The rest is analogous to those characterized in (2) (3) (3).

$$gV_{j,t} = \gamma + \phi_j gV_{j,t-1} + u_{i,t} \tag{7}$$

$$AGV_{j,t} = gV_{j,t} - (\hat{\gamma} + \hat{\phi}_j gV_{j,t-1}) \tag{8}$$

$$CAGV_{j(t_1,t_2)} = \sum_{t_1}^{t_2} AGV_{j,t} \tag{9}$$

$$AAGV_t = \frac{1}{I_t} \sum_{j=1}^{I_t} AGV_{j,t} \tag{10}$$

Here, the interpretation of the cumulative abnormal term is the cumulative abnormal growth in trading volume of the representative index of market j from date t_1 to t_2 .

Similarly, the illiquidity-based event study is parallel to equations (5)–(10) above, and we construct the cumulative abnormal change rate of illiquidity and average abnormal ones as follows:

$$ILLIQ_t = D^{-1} \sum_d \{R_{dt} / \text{TURNOVER}_{dt}\} \tag{11}$$

$$CAGIL_{j(t_1,t_2)} = \sum_{t_1}^{t_2} AGIL_{j,t} \tag{12}$$

Table 2
CAR, CAGV, and CAGL — Effective markets.

Country/Region	AU	CN	JP	NZ	SG	TH	VN
Panel A. Jan 31st, 2020							
CAR (-5, 5)	-0.95%	-7.51%	-3.75%	-0.01%	-0.25%	-2.04%	-3.04%
CAGV (-5, 5)	53.03%	37.48%	86.89%	52.76%	10.98%	-4.92%	58.54%
CAGL (-5, 5)	2243.42%	20349.46%	-171.88%	-2913.59%	-2216.84%	1671.95%	-1169.68%
Panel B. Mar 11th, 2020							
CAR (-5, 5)	-11.55%	13.13%	2.11%	-13.47%	-6.39%	-11.41%	-7.10%
CAGV (-5, 5)	66.94%	-48.77%	67.37%	59.86%	73.33%	12.75%	16.37%
CAGL (-5, 5)	-1215.65%	2901.67%	-401.72%	722.25%	-1568.53%	-2652.14%	-298.54%
Panel C. Apr. 9th, 2020							
CAR (-5, 5)	-4.82%	1.50%	0.71%	2.78%	-0.10%	8.27%	15.66%
CAGV (-5, 5)	-29.36%	11.15%	-64.14%	20.82%	-54.89%	7.90%	19.83%
CAGL (-5, 5)	-990.88%	223.12%	47704.79%	-1230.03%	-4950.71%	11506.57%	8539.09%
Panel D. Dec. 18th, 2020							
CAR (-5, 5)	-0.55%	1.79%	1.38%	1.69%	0.55%	-1.35%	5.93%
CAGV (-5, 5)	-100.02%	1.69%	-23.61%	-134.00%	-154.58%	-50.38%	20.34%
CAGL (-5, 5)	2980.81%	465.78%	-676.34%	-337.80%	-3994.89%	2360.62%	-1139.46%
Panel E. Jan 11th, 2021							
CAR (-5, 5)	-3.38%	-0.87%	-1.89%	-5.76%	0.98%	-0.18%	-1.90%
CAGV (-5, 5)	81.30%	29.28%	32.22%	134.09%	110.20%	-0.87%	62.10%
CAGL (-5, 5)	-38127.58%	431.30%	-749.23%	413.57%	6404.51%	7405.60%	-0.59%
Panel F. Apr 4th, 2021							
CAR (-5, 5)	2.43%	-0.57%	2.33%	1.73%	1.32%	-2.25%	6.09%
CAGV (-5, 5)	-16.57%	0.82%	-50.55%	15.76%	-51.68%	-62.30%	28.71%
CAGL (-5, 5)	6430.99%	-5428.98%	-3288.08%	-645.06%	-69.40%	860.66%	-2023.41%
Panel G. Nov 24th, 2021							
CAR (-5, 5)	-1.51%	3.14%	-3.84%	-1.88%	-3.78%	-3.01%	-3.04%
CAGV (-5, 5)	14.35%	17.10%	19.13%	38.39%	-41.59%	-8.62%	-34.64%
CAGL (-5, 5)	4218.19%	-4463.44%	-2473.85%	-1722.24%	17220.34%	-2315.55%	416.41%
Panel H. Apr 15th, 2022							
CAR (-5, 5)	416.41%	-5.00%	3.16%	-2.15%	-1.45%	0.24%	-14.91%
CAGV (-5, 5)	21.53%	17.65%	-12.40%	-4.82%	55.18%	-15.83%	-24.17%
CAGL (-5, 5)	1430.87%	-3400.69%	-292.47%	1668.91%	1874.59%	-39890.30%	-11325.81%

Note: This table reports the cumulated abnormal returns, volume growths, and illiquidity change rates for 5 developed RCEP countries, respectively.

$$AAGIL_t = \frac{1}{I_t} \sum_{j=1}^{I_t} AGIL_{jt} \tag{13}$$

Equation (11) specifies the measurement of the market illiquidity, following Bortolotti, de Jong, Nicodano, & Schindele, 2007. The market illiquidity on date t is defined as the average ratio of daily absolute returns to daily turnover along a D-days period. R_{dt} is the absolute market return on day d of the D days, and the $TURNOVER_{dt}$ is the daily market trading volume divided by daily market capitalization.

3.1.2. Multivariate panel regression

We further did multivariate panel regression as in model (9) based on the results of the event studies. Using whether the agreement takes effect for the participating countries, we have those participating countries with the agreement effective as a quasi-experiment group, and those with the agreement only signed but not effective as the control group. And the difference between them can be further checked in the following regression.

$$y_{i,t} = \alpha + \beta \bullet Effective + \eta X_{i,t} + Event FE_i + Country FE_i + v_{i,t} \tag{14}$$

$y_{i,t}$. The output variable represents the absolute terms of the estimated $AR_{i,t}$, $AGV_{i,t}$, and $AGL_{i,t}$, which is to be explained by the following variables.

Effective. This is an indicator variable of the agreement taking effect on Jan 1st 2022 for the RCEP participating countries.

$X_{i,t}$. This is a vector variable that contains being a developed economy, growth rate of total cases, and the indicators of the money market, the exchange market, and the commodity market. We use 3-month risk free rate as the indicator for the money market, the domestic to US exchange rate as the indicator for the exchange market, and the Dubai Fateh crude oil spot price (FOB) as the indicator of the commodity market.

3.2. Data description

There are three major data sources. We use WIND for the representative index price and trading volume of 11 RCEP markets. 4 RCEP countries, Brunei, Cambodia, the Lao PDR and Myanmar were not included into the sampling countries, because Brunei doesn't have a stock market, and the stock markets of Cambodia, the Lao PDR, and Myanmar are still immature, with less than 10 publicly

Table 3
CAR, CAGV, and CAGL — Non-effective markets.

Country/Region	ID	SK	MY	PH	IN
Panel A. Jan 31st, 2020					
CAR (-5, 5)	-0.04%	0.32%	-1.66%	1.11%	-0.21%
CAGV (-5, 5)	-1.01%	4.41%	41.25%	2.05%	65.84%
CAGL (-5, 5)	-916.90%	-46451.35%	4022.62%	7973.39%	2823.44%
Panel B. Mar 11th, 2020					
CAR (-5, 5)	-10.74%	-0.64%	-7.69%	-13.47%	-0.1432519
CAGV (-5, 5)	-14.78%	21.41%	74.65%	54.42%	100.31%
CAGL (-5, 5)	-648.96%	-2329.95%	1496.42%	-579.00%	-3472.55%
Panel C. Apr. 9th, 2020					
CAR (-5, 5)	-1.37%	3.63%	2.25%	1.40%	4.51%
CAGV (-5, 5)	41.57%	-7.14%	-41.12%	-52.80%	-211.68%
CAGL (-5, 5)	307.39%	-303715.60%	-5416.89%	2984.42%	4494.80%
Panel D. Dec. 18th, 2020					
CAR (-5, 5)	2.65%	1.56%	-0.47%	-0.44%	2.65%
CAGV (-5, 5)	-67.06%	-28.71%	-114.93%	-54.47%	-40.62%
CAGL (-5, 5)	-2366.15%	13918.09%	1722.45%	-9135.59%	5353.31%
Panel E. Jan 11th, 2021					
CAR (-5, 5)	0.19%	-1.28%	-2.83%	-3.31%	-3.29%
CAGV (-5, 5)	34.30%	24.29%	15.16%	-39.04%	-20.78%
CAGL (-5, 5)	1868.28%	11798.82%	2209.21%	-5334.18%	6713.66%
Panel F. Apr 4th, 2021					
CAR (-5, 5)	-3.36%	2.40%	0.29%	-0.02%	-2.20%
CAGV (-5, 5)	-15.18%	27.13%	63.97%	54.38%	21.06%
CAGL (-5, 5)	10525.10%	11997.70%	2426.52%	-5904.67%	33.27%
Panel G. Nov 24th, 2021					
CAR (-5, 5)	-1.10%	1.69%	-1.44%	-2.46%	-4.33%
CAGV (-5, 5)	-20.59%	-21.46%	93.67%	-41.59%	28.81%
CAGL (-5, 5)	-892.65%	3272.09%	-935.73%	-835.71%	-1812.87%
Panel H. Apr 15th, 2022					
CAR (-5, 5)	1.95%	2.72%	0.76%	0.63%	-1.79%
CAGV (-5, 5)	3.64%	2.21%	-7.46%	6.45%	-30.81%
CAGL (-5, 5)	2253.69%	-15495.24%	-1679.49%	-27.86%	584.25%

Note: This table reports the cumulated abnormal returns, volume growths, and illiquidity change rates for 5 developed RCEP countries, respectively.

traded firms. We use OWID Covid-19 Dataset for the daily accumulated confirmed cases, and Bloomberg for the 3-month risk free rate, exchange rate, and the Dubai Fateh crude oil spot price (FOB). We use FTSE Asia Pacific Index as the representative index of the big regional market, which is composed of representative stocks from markets including Australia, India, Indonesia, Japan, Korea, Malaysia, New Zealand, China, Pakistan, Philippines, Singapore and Thailand. The sampling period is from 2019 September to 2022 May, which covers the WHO's announcements of the emergence of all existing COVID-19 Variants of Concern.

Table 1 summarizes the stock index we use for each market, whether it is a developed economy, whether it is a RCEP participating country, and whether the RCEP agreement took effect for the economy on Jan 1st 2022.

The min-max normalized index prices of “effective” markets and “non-effective” markets are plotted in Figs. 1 and 2. By comparing them, we find that the “effective” RCEP markets showed an obviously more converging pattern as it moves from the early stage to mid-term stage of the pandemic. The diving trends in March are very close to that of the US stock market for all developed markets and many of the emerging markets. Developed markets tend to recover faster than the emerging markets.

Traditional event studies target at firm-level stock market performance, of which the related events tend to be more valid in explaining the performance change, while in this paper we did market-level analysis. Therefore, the results provided value mostly in unfolding how the things were going on during the period of ongoing shocks, rather than validating the causal effect of the COVID-19 on the stock markets.

4. Results and findings

4.1. Short-term stock market response

We integrate our results of the cumulative abnormal performance with respects to “effective” markets in Table 2, and to “non-effective” markets in Table 3. We further present the daily average abnormal performance of the eight event periods in Tables 4–11.

From the perspective of the returns, most of the countries experienced worsened declines along the first three events, and they recovered for the event on Apr. 9th when the Fed announced a stimulus. This was not the case for the markets of Japan, China and Cambodia, which recovered earlier on March 11th. As for growths in trading volume, there doesn't seem to have any converging patterns along the time. However, those of the developing countries' stock markets were more volatile. For the change rate of the illiquidity, both developed and emerging markets showed volatile patterns.

Generally speaking, at least since Jan. 20th, 2020, the unexplained returns relative to the market of the RCEP countries turned

Table 4
Jan. 31st, 2020—AAR, AAGV, and AAGL of total, emerging, and developed markets.

Date	Total markets			“Effective” markets			“Non-effective” markets						
	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL				
25-Jan	−0.06%	7.08%	648.58%	0.04%	0.44%	1104.94%	−0.24%	18.69%	**	−150.04%			
26-Jan	0.38%	−5.07%	755.68%	0.03%	2.70%	121.31%	1.00%	−18.66%	***	1865.82%			
27-Jan	0.0005	−14.10%	−0.6616	0.08%	−6.52%	−0.5212	−0.02%	−27.37%	**	−90.74%			
28-Jan	−1.35%	***	21.18%	−2.4743	−1.16%	*	17.44%	−4.5783	−1.67%	***	0.2773	120.76%	
29-Jan	0.11%	1.40%	−113.91%	**	0.05%	−1.76%	−117.98%	**	0.22%	6.93%	−106.80%		
30-Jan	−0.60%	23.16%	−3.4652	−1.04%	0.3796	−1.9413	0.18%	−2.74%	−1.66%	***	0.2798	**	77.86%
31-Jan	−0.68%	11.84%	−113.38%	−0.12%	2.62%	−222.65%	−1.66%	***	0.2798	**	77.86%		
1-Feb	−0.46%	**	−19.98%	−149.71%	−0.63%	**	−24.53%	−212.47%	−0.15%	−12.03%	−39.88%		
2-Feb	0.06%	−9.31%	−3815.75%	−0.13%	−6.28%	−44.30%	0.40%	*	−14.62%	**	−10000.00%		
3-Feb	0.45%	**	5.14%	−61.76%	0.43%	*	5.95%	−34.57%	0.49%	3.71%	−109.33%		
4-Feb	0.41%	*	9.71%	19.1224	0.38%	14.08%	**	2651.66%	0.46%	2.05%	618.25%		

Note: This table reports the average cumulated abnormal return, trading volume growth, and illiquidity change rates of the event on Jan. 31st, 2020 for total, emerging and developed markets, respectively.

Table 5
Mar. 11th, 2020—AAR, AAGV, and AAGL of total, emerging, and developed markets.

Date	Total markets			“Effective” markets			“Non-effective” markets			
	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL	
6-Mar	0.31%	−5.14%	14.34%	−0.32%	−9.07%	−68.73%	1.41%	** 1.74%	159.71%	**
7-Mar	−0.10%	2.14%	129.44%	0.12%	6.59%	209.56%	−0.50%	** −5.65%	−10.76%	
8-Mar	−0.28%	−4.75%	−21.35%	−0.33%	−12.26%	−43.93%	−0.18%	8.40%	18.17%	
9-Mar	−2.40%	*** 30.05%	*** 313.76%	* −2.46%	** 37.27%	*** 332.09%	−2.31%	* 17.42%	281.69%	*
10-Mar	0.37%	5.87%	−60.77%	0.49%	8.04%	−71.78%	0.14%	2.07%	−41.50%	
11-Mar	−0.13%	−13.10%	−1.9003	−0.63%	−16.19%	** −3.2649	0.73%	−7.70%	0.4877	
12-Mar	−1.35%	17.34%	** 104.04%	−1.47%	0.2208	** 284.28%	−1.14%	9.04%	−211.39%	
13-Mar	0.17%	28.96%	*** −6.23%	0.35%	23.90%	** −22.22%	−0.15%	37.81%	** 21.74%	
14-Mar	−1.95%	** −21.10%	*** −367.10%	−1.88%	−0.2121	*** −74.39%	−2.09%	−20.92%	* −879.35%	
15-Mar	−1.71%	−1.24%	−15.09%	0.25%	0.07%	−56.19%	−5.13%	* −0.0353	56.83%	
16-Mar	0.48%	−4.16%	−316.84%	0.90%	−3.82%	−521.15%	−0.25%	−4.76%	40.71%	

Note: This table reports the average cumulated abnormal return, trading volume growth, and illiquidity change rates of the event on Mar. 11th, 2020 for total, emerging and developed markets, respectively.

Table 6
Apr. 9th, 2020—AAR, AAGV, and AAGL of total, emerging, and developed markets.

Date	Total markets			“Effective” markets			“Non-effective” markets		
	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL
19-Feb	0.89%	0.89%	613.15%	0.0061	−2.86%	986.90%	1.39%	−30.47%	−40.91%
20-Feb	1.26%	**	−102.21%	0.0124	8.49%	−195.78%	1.30%	*	61.52%
21-Feb	0.59%	0.59%	5135.76%	0.56%	−0.36%	6813.99%	0.65%	28.27%	2198.87%
22-Feb	−0.0014	−0.14%	1209.10%	0.31%	14.87%	1828.84%	−0.93%	15.73%	124.55%
23-Feb	−0.68%	−0.68%	98.39%	0.02%	−6.96%	55.84%	−1.91%	**	172.85%
24-Feb	0.0028	0.28%	−0.5609	0.08%	−3.71%	−0.5468	0.64%	−13.16%	−0.5854
25-Feb	0.35%	0.35%	−382.65%	0.53%	−18.37%	−577.78%	0.05%	−12.53%	−41.17%
26-Feb	0.0032	0.32%	−88.87%	* 0.0009	12.07%	−70.69%	0.72%	14.48%	−120.70%
27-Feb	−0.38%	−0.38%	41.05%	0.16%	4.02%	81.90%	−1.33%	19.55%	−30.44%
28-Feb	0.0017	0.17%	−28000.00%	0.03%	−2.14%	−11.95%	0.43%	0.108	−78000.00%
29-Feb	0.05%	0.05%	−266.09%	−0.19%	−17.73%	−170.59%	0.48%	−23.66%	−433.22%

Note: This table reports the average cumulated abnormal return, trading volume growth, and illiquidity change rates of the event on Apr. 9th, 2020 for total, emerging and developed markets, respectively.

Table 7
Dec. 18th, 2020—AAR, AAGV, and AAGL of total, emerging, and developed markets.

Date	Total markets			“Effective” markets			“Non-effective” markets		
	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL
19-Feb	0.08%	3.26%	202.56%	−0.30%	3.40%	168.26%	0.74%	3.01%	262.59%
20-Feb	0.46%	−4.62%	24.54%	0.62%	−13.94%	** −319.73%	0.19%	11.68%	627.02%
21-Feb	0.04%	−3.55%	12.70%	−0.03%	0.35%	−105.31%	** 0.17%	−10.36%	219.23%
22-Feb	−0.0006	** 7.03%	−366.47%	−0.0021	15.20%	−224.24%	0.20%	−7.27%	−615.37%
23-Feb	−0.51%	−2.33%	106.51%	−0.39%	5.00%	48.17%	−0.73%	*** −15.15%	208.59%
24-Feb	0.0004	12.62%	1.2683	0.0007	16.09%	−1.4818	** −0.02%	6.56%	6.0809
25-Feb	0.06%	−14.75%	* 358.64%	−0.19%	−0.1534	437.67%	0.51%	−13.72%	220.34%
26-Feb	0.0057	−2.27%	173.72%	0.98%	* −10.00%	208.67%	−0.16%	11.26%	* 112.55%
27-Feb	−0.20%	−18.62%	*** −4.68%	−0.22%	−0.1588	** −120.07%	* −0.16%	−23.42%	** 197.26%
28-Feb	0.0037	−41.57%	*** −381.41%	0.36%	−46.00%	** −14.20%	0.38%	−0.3381	** −1024.02%
29-Feb	0.17%	0.64%	92.28%	0.65%	−1.80%	20.20%	−0.68%	4.92%	218.42%

Note: This table reports the average cumulated abnormal return, trading volume growth, and illiquidity change rates of the event on Dec. 18th, 2020 for total, emerging and developed markets, respectively.

Table 8
Jan. 11th, 2021—AAR, AAGV, and AAGL of total, emerging, and developed markets.

Date	Total markets			“Effective” markets			“Non-effective” markets							
	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL					
19-Feb	−1.00%	24.20%	*	130.58%	−1.00%	13.31%	17.80%		43.26%	327.93%				
20-Feb	0.08%	18.80%	**	66.39%	0.32%	29.95%	***	−31.46%	−0.36%	−0.73%	237.63%			
21-Feb	−0.03%	13.20%		−975.27%	0.31%	24.73%	*	−1623.84%	−0.60%	***	−6.97%	159.72%		
22-Feb	0.0073	***	13.68%	*	−10.98%	0.0078	***	15.51%	**	−83.26%	0.63%	**	10.49%	115.52%
23-Feb	−0.03%	4.32%		169.10%	−0.46%	−3.46%		12.52%	0.73%	*	17.94%		443.10%	
24-Feb	0.0022	−5.33%		0.2646	−0.0007	−0.12	*	−1.1437	0.72%		6.33%		2.729	
25-Feb	−0.08%	−11.96%	***	929.66%	0.22%	−10.85%	**	1250.41%	−0.59%	*	−13.88%		368.36%	
26-Feb	−0.0024	7.32%		18.86%	−0.46%	**	13.52%	*	−56.26%	0.14%	−3.52%		150.31%	
27-Feb	−0.39%	−5.45%		787.20%	−0.46%	−7.11%		1112.24%	−0.27%		−2.55%		218.39%	
28-Feb	0.0002	−11.49%	*	160.18%	0.19%	−4.44%		282.77%	−0.29%		−0.2382	*	−54.36%	
29-Feb	−2.03%	***	−3.38%	−2545.83%	−2.09%	**	4.89%	−4226.90%	−1.92%	***	−17.86%	*	396.04%	

Note: This table reports the average cumulated abnormal return, trading volume growth, and illiquidity change rates of the event on Jan. 11th, 2021 for total, emerging and developed markets, respectively.

Table 9
Apr. 4th, 2021—AAR, AAGV, and AAGL of total, emerging, and developed markets.

Date	Total markets			“Effective” markets			“Non-effective” markets						
	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL				
19-Feb	−0.07%	0.68%	−117.57%	−0.24%	−1.37%	−303.30%	0.24%	4.27%	207.47%				
20-Feb	0.05%	0.30%	−51.54%	0.33%	−3.31%	−214.98%	−0.44%	6.62%	234.48%				
21-Feb	0.29%	6.16%	111.32%	0.39%	4.73%	162.85%	0.11%	8.67%	21.13%				
22-Feb	0.0002	7.72%	92.28%	0.0046	6.34%	−128.97%	−0.76%	10.14%	479.46%				
23-Feb	−0.22%	−17.88%	**	19.17%	−0.09%	−17.09%	**	−37.38%	−0.43%	*	−19.27%	118.12%	
24-Feb	0.0029	−7.39%	**	0.9275	0.004	3.73%	0.3772	0.08%	−26.86%		1.8905		
25-Feb	0.14%	10.78%	**	49.58%	−0.05%	0.1104	**	−30.10%	0.48%		10.32%	189.02%	
26-Feb	0.0044	**	7.26%	92.09%	0.18%	−11.10%	41.29%	0.89%	**		39.39%	**	181.00%
27-Feb	−0.10%	−2.22%		−54.61%	0.04%	−0.1257	**	−193.87%	−0.35%		15.88%		189.09%
28-Feb	−0.0004	0.46%		259.55%	−0.29%	−4.15%		234.09%	0.39%	*	0.0852		304.10%
29-Feb	0.15%	−6.37%		859.84%	0.46%	4.34%		−162.10%	−0.40%		−25.12%		2648.24%

Note: This table reports the average cumulated abnormal return, trading volume growth, and illiquidity change rates of the event on Apr. 4th, 2021 for total, emerging and developed markets, respectively.

Table 10
Nov. 24th, 2021—AAR, AAGV, and AAGL of total, emerging, and developed markets.

Date	Total markets			Emerging markets			Developed markets								
	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL						
19-Feb	0.02%	−2.31%	226.09%	0.03%	−0.42%	116.51%	0.01%	−5.62%	417.86%						
20-Feb	−0.10%	−1.88%	−124.42%	−0.02%	−1.10%	−179.98%	−0.24%	−3.25%	−27.20%						
21-Feb	−0.02%	9.17%	−22.25%	−0.22%	7.30%	60.56%	0.34%	12.44%	−167.16%						
22-Feb	0.0019	−2.54%	−16.27%	−0.0003	0.33%	−34.03%	0.57%	−7.57%	14.81%						
23-Feb	0.34%	0.23%	93.36%	0.42%	**	−1.38%	−116.21%	0.18%	3.05%	460.11%					
24-Feb	0.0038	*	3.91%	−0.9177	0.0039	0.0816	*	−1.208	0.36%	***	−3.51%	−0.4095			
25-Feb	−1.64%	***	42.01%	**	1293.65%	−1.80%	***	14.21%	1981.18%	−1.37%	*	90.65%	90.47%		
26-Feb	−0.0072		41.48%	**	52.64%	−0.29%	**	52.36%	**	48.75%	−1.48%	22.42%	59.44%		
27-Feb	0.01%		−47.90%	***	−238.48%	0.03%	***	−38.54%	***	−103.77%	**	−0.03%	−64.29%	**	−474.22%
28-Feb	0.0005		−30.76%	**	−157.90%	−0.34%	**	−30.05%	*	−191.01%		0.74%	−0.32	−99.96%	
29-Feb	−0.07%		−4.89%		29.70%	−0.17%		−2.08%		93.07%		0.10%	−9.81%	*	−81.19%

Note: This table reports the average cumulated abnormal return, trading volume growth, and illiquidity change rates of the event on Nov. 24th, 2021 for total, emerging and developed markets, respectively.

Table 11
Apr. 15th, 2022—AAR, AAGV, and AAGL of total, emerging, and developed markets.

Date	Total markets			Emerging markets			Developed markets					
	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL	AAR	AAGV	AAGIL			
19-Feb	-0.15%	-3.63%	-89.96%	0.19%	-7.92%	-205.36%	-0.27%	3.89%	112.00%			
20-Feb	0.01%	-4.26%	-23.44%	0.33%	-5.20%	-8.48%	-0.12%	-2.61%	-49.63%			
21-Feb	-0.33%	-1.24%	24.01%	-0.65%	4.19%	-19.70%	-0.21%	-10.75%	100.50%			
22-Feb	0.0007	-2.82%	-73.38%	0.0024	-8.52%	-191.29%	0.01%	7.17%	132.95%			
23-Feb	0.08%	-10.67%	**	-419.25%	0.33%	-11.66%	*	-188.07%	-0.02%	-8.94%	**	-823.81%
24-Feb	-0.002	-6.93%	**	-5.2209	0.0023	-1.10%	*	-0.5297	-0.37%	-17.14%	*	-13.4304
25-Feb	0.14%	21.44%	**	-106.15%	0.13%	0.1243	*	-164.97%	0.15%	37.20%	*	-3.22%
26-Feb	-0.0005	5.24%	**	126.16%	0.65%	-0.99%	*	137.23%	-0.32%	16.16%	*	106.79%
27-Feb	-0.16%	1.54%	**	-797.47%	-0.50%	0.1466	*	-131.42%	-0.04%	-21.41%	*	-1963.07%
28-Feb	-0.0012	6.66%	**	-98.40%	-0.98%	7.54%	*	-106.45%	0.21%	0.0513	*	-84.31%
29-Feb	-0.72%	-1.52%	**	-3918.55%	-0.24%	1.88%	*	-6202.07%	-0.90%	-7.48%	**	77.61%

Note: This table reports the average cumulated abnormal return, trading volume growth, and illiquidity change rates of the event on Apr. 15th, 2022 for total, emerging and developed markets, respectively.

Table 12
Explanatory factors for the absolute terms of estimated abnormal returns.

Abs(Abnormal returns)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Effective	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	-0.001*** (0.000)	0.001 (0.002)	-0.001*** (0.000)
Developed	-0.001 (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.002*** (0.000)	-0.002 (0.001)	-0.002*** (0.000)
△% Cases per capita	0.011** (0.005)	0.010** (0.005)	0.010** (0.004)	0.010** (0.005)	0.008* (0.004)	0.008* (0.004)	0.003 (0.004)	0.003 (0.004)
△% Exchange rate		0.300*** (0.106)	0.249** (0.109)	0.252** (0.108)	0.233** (0.094)	0.234** (0.095)	0.233** (0.096)	0.233** (0.096)
△% Gold Price			-0.081* (0.042)	-0.076** (0.038)	-0.074* (0.038)	-0.074* (0.038)	-0.066* (0.036)	-0.066* (0.037)
△% 3-Month Risk Free Rate				0.006 (0.004)	0.006 (0.004)	0.006 (0.004)	0.007* (0.004)	0.007* (0.004)
△% Dubai Fateh Crude Oil Price (FOB)					-0.045*** (0.011)	-0.045*** (0.011)	-0.038*** (0.010)	-0.038*** (0.010)
Country FE	N	N	N	N	N	Y	N	Y
Event FE	N	N	N	N	N	N	Y	Y
Constant	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.008*** (0.001)	0.013*** (0.000)	0.006*** (0.002)	0.011*** (0.001)
N	952	952	952	952	952	952	952	952
Number of stock markets	11	11	11	11	11	11	11	11

Note: This table presents the panel regression results of multiple explanatory factors on abnormal returns of the four events. The major explanatory variable is being a participating country for which the RCEP agreement took effect on Jan 1st, 2022. We also control for being a developed economy, the growth of COVID-10 cases, the exchange market, the commodity market (represented by gold and crude oil) and the money market (represented by 3-month risk free rate). Robust standard errors in parentheses, ***p < 0.01, **p < 0.05, *p < 0.1. Robust standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

Table 13
Explanatory factors for the absolute terms of estimated abnormal trading volume growths.

Abs(Abnormal trading volume growths)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Effective	-0.067 (0.042)	-0.067 (0.042)	-0.067 (0.043)	-0.068 (0.043)	-0.068 (0.043)	-0.120*** (0.002)	-0.067 (0.042)	-0.119*** (0.002)
Developed	0.059 (0.055)	0.059 (0.055)	0.059 (0.055)	0.059 (0.055)	0.060 (0.056)	0.039*** (0.002)	0.060 (0.056)	0.038*** (0.002)
△% Cases per capita	-0.027 (0.050)	-0.024 (0.049)	-0.024 (0.048)	-0.024 (0.049)	-0.047 (0.048)	-0.048 (0.049)	-0.010 (0.041)	-0.029 (0.043)
△% Exchange rate		-0.773 (0.716)	-0.696 (0.670)	-0.683 (0.668)	-0.908 (0.565)	-0.936 (0.576)	-0.268 (0.600)	-0.839 (0.695)
△% Gold Price			0.124 (0.483)	0.140 (0.481)	0.127 (0.473)	0.122 (0.474)	0.029 (0.440)	-0.039 (0.416)
△% 3-Month Risk Free Rate				0.021 (0.031)	0.014 (0.031)	0.014 (0.031)	0.003 (0.025)	0.010 (0.028)
△% Dubai Fateh Crude Oil Price (FOB)					-0.447*** (0.094)	-0.447*** (0.095)	-0.472*** (0.112)	-0.477*** (0.109)
Country FE	N	N	N	N	N	Y	N	Y
Event FE	N	N	N	N	N	N	Y	Y
Constant	0.228*** (0.040)	0.228*** (0.040)	0.228*** (0.040)	0.228*** (0.040)	0.226*** (0.040)	0.252*** (0.003)	0.227*** (0.044)	0.257*** (0.029)
N	831	831	831	831	831	831	831	831
Number of stock markets	11	11	11	11	11	11	11	11

Note: This table presents the panel regression results of multiple explanatory factors on abnormal trading volume growths of the four events. The major explanatory variable is being a participating country for which the RCEP agreement took effect on Jan 1st, 2022. We also control for being a developed economy, the growth of COVID-10 cases, the exchange market, the commodity market (represented by gold and crude oil) and the money market (represented by 3-month risk free rate). Robust standard errors in parentheses, ***p < 0.01, **p < 0.05, *p < 0.1. Robust standard errors in parentheses.

negative and continued to decline for the next months, with emerging markets experiencing greater decline compared to the developed markets. The negative CARs are the largest in magnitude for the event date of Mar. 11th, when WHO declared a global pandemic, and the Fed stimulus on Apr. 9th, 2020 helped the stock market restore some of the stock price levels. Further, the unexplained volume growth relative to previous volume growth for each stock index turned negative and continued to decline since Jan. 31st. In general, compared to developed markets, the emerging markets had a more volatile change in trading volume growth than the developed

Table 14
Explanatory factors for the absolute terms of estimated abnormal illiquidity growths.

Abs(AGIL)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Effective	−9.836 (10.327)	−9.856 (10.537)	−9.788 (10.528)	−9.668 (10.497)	−9.640 (10.516)	−1.324*** (0.417)	−9.571 (10.525)	−1.439*** (0.409)
Developed	0.480 (2.054)	1.247 (2.233)	1.581 (2.406)	1.842 (2.409)	1.805 (2.360)	6.758** (3.078)	1.704 (2.310)	6.467** (2.880)
△% Cases per capita	−9.863 (6.846)	−5.853* (3.009)	−5.838 (3.568)	−4.331 (2.858)	−1.558 (3.440)	3.320 (7.023)	−0.223 (3.652)	2.184 (5.064)
△% Exchange rate		−1,039.731 (1,197.560)	−1,405.703 (1,616.467)	−1,433.781 (1,628.628)	−1,434.766 (1,614.253)	−1,481.891 (1,666.159)	−1,291.941 (1,504.971)	−1,310.829 (1,529.943)
△% Gold Price			−582.328 (700.233)	−601.481 (699.801)	−604.005 (702.400)	−607.480 (708.473)	−832.737 (907.078)	−835.016 (912.845)
△% 3-Month Risk Free Rate				−25.360 (20.889)	−24.885 (20.673)	−24.469 (20.971)	−22.282 (22.510)	−22.154 (22.722)
△% Dubai Fateh Crude Oil Price (FOB)					28.513 (49.518)	30.792 (51.466)	2.677 (33.220)	3.137 (33.729)
Country FE	N	N	N	N	N	Y	N	Y
Event FE	N	N	N	N	N	N	Y	Y
Constant	16.518 (10.479)	17.123 (11.247)	16.654 (10.792)	16.595 (10.748)	16.680 (10.979)	5.695*** (0.552)	18.053 (11.918)	7.169*** (1.951)
N	952	952	952	952	952	952	952	952
Number of stock markets	11	11	11	11	11	11	11	11

Note: This table presents the panel regression results of multiple explanatory factors on abnormal illiquidity growths of the four events. The major explanatory variable is being a participating country for which the RCEP agreement took effect on Jan 1st, 2022. We also control for being a developed economy, the growth of COVID-10 cases, the exchange market, the commodity market (represented by gold and crude oil) and the money market (represented by 3-month risk free rate). Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses.

markets.

4.2. Role of the agreement effectiveness, the economic development level, and competing market indicators

Tables 12–14 show the results of the panel regression specified in equation (14) with regards to the abnormal returns, volume growths, and illiquidity growths. Being an “effective” market is statistically significantly associated with a lower absolute value of abnormal return, abnormal trading volume growth, and abnormal illiquidity growth. In response to shocks, “effective” markets showed less activity and lower degree of fluctuation compared with “non-effective” markets. Although the agreement didn’t take effect until the beginning of 2022, the previous RCEP meetings had already incorporated information with regard to the kick-off action in early 2022.

5. Conclusion

By using the methodology of return-based, volume-based and illiquidity-based event studies, as well as a multivariate panel regression, we contribute to the literature in terms of integrating the impact of COVID19-related events and US fiscal policy on the RCEP countries. We find that developed RCEP markets responded faster to and recovered faster from shocks brought by the COVID-19 pandemic in the short run, while the emerging markets appeared to be less efficient and have weaker risk-resistant ability than the developed markets. Domestic-to-USD exchange rate growth is associated with more severe abnormal return and abnormal liquidity drop for emerging RCEP markets, suggesting that the capital structure of which is more dominated by international floating capital. In the long run, trading benefits brought by the RCEP agreement are expected to form and strengthen a system of circular flow of international trading activities among the participating countries, which will in turn increase the risk resistance ability of their stock markets. We believe that strengthened coordination among RCEP countries (regions) will help better smooth the overall stock market volatility and improve the market efficiency in the future. In the long run, trading benefits brought by the RCEP agreement are expected to form and strengthen a system of circular flow of international trading activities among the participating countries, which will in turn enhance the risk resistance ability of their stock markets.

Author statement

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References

Ahmed, A. D., & Huo, R. (2019). Impacts of China’s crash on Asia-Pacific financial integration: Volatility interdependence, information transmission and market Co-movement. *Economic Modelling*, 79, 28–46. <https://doi.org/10.1016/j.econmod.2018.09.029>

- Ajinkya, B. B., & Jain, P. C. (1989). The Behavior of daily stock market trading volume. *Journal of Accounting and Economics*, 11(4), 331–359. [https://doi.org/10.1016/0165-4101\(89\)90018-9](https://doi.org/10.1016/0165-4101(89)90018-9)
- Akhtaruzzaman, M., Boubaker, S., Lucey, B. M., & Ahmet Sensoy. (2021). Is gold A hedge or A safe-haven asset in the COVID-19 crisis? *Economic Modelling*, 102, Article 105588. <https://doi.org/10.1016/j.econmod.2021.105588>
- Altig, D., Baker, S. A., Maria Barrero, J., Bloom, N., Bunn, P., Chen, S., Steven, J., Davis, et al. (2020). Economic uncertainty before and during the COVID-19 pandemic. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3638649>
- Ashraf, B. N. (2020). Stock markets' reaction to COVID-19: Cases or fatalities? *Research in International Business and Finance*, 54, Article 101249. <https://doi.org/10.1016/j.ribaf>
- Baek, S., Mohanty, S. K., & Glambosky, M. (2020). COVID-19 and stock market volatility: An industry level analysis. *Finance Research Letters*, 37, Article 101748. <https://doi.org/10.1016/j.frl.2020.101748>
- Baker, S. R., Bloom, N., Davis, S. J., Kost, K., Sammon, M., & Viratyosin, T. (2020). The unprecedented stock market reaction to COVID-19. *The Review of Asset Pricing Studies*, 10(4), 742–758. <https://doi.org/10.1093/rapsstu/raaa008>
- Balistreri, E. J., & Tarr, D. G. (2020). Comparison of deep integration in the melitz, krugman and Armington models: The case of the Philippines in RCEP. *Economic Modelling*, 85, 255–271. <https://doi.org/10.1016/j.econmod.2019.05.023>
- BenMim, I., & Ahmed, B. S. (2019). Financial contagion across major stock markets: A study during crisis episodes. *The North American Journal of Economics and Finance*, 48, 187–201. <https://doi.org/10.1016/j.najef.2019.02.005>
- Bortolotti, B., de Jong, F., Nicodano, G., & Schindele, I. (2007). Privatization and stock market liquidity. *Journal of Banking & Finance*, 31(2), 297–316. <https://doi.org/10.1016/j.jbankfin.2006.04.008>
- Burdekin, R. C. K., & Ran, T. (2021). The golden hedge: From global financial crisis to global pandemic. *Economic Modelling*, 95, 170–180. <https://doi.org/10.1016/j.econmod.2020.12.009>
- Capelle-Blancard, G., & Desroziers, A. (2020). The stock market is not the economy? Insights from the COVID-19 crisis. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3638208>
- Chiang, T. C. (2021). Geopolitical risk, economic policy uncertainty and asset returns in Chinese financial markets. *China Finance Review International*, 11(4), 474–501. <https://doi.org/10.1108/CFRI-08-2020-0115>
- Ciner, C. (2021). Stock return Predictability in the time of COVID-19. *Finance Research Letters*, 38, Article 101705. <https://doi.org/10.1016/j.frl.2020.101705>
- Contessi, S., & De Pace, P. (2021). The international spread of COVID-19 stock market collapses. *Finance Research Letters*, 101894. <https://doi.org/10.1016/j.frl.2020.101894>
- Cox, J., Greenwald, D. L., & Ludvigson, S. C. (2021). *NBER working papers*. Nber.Org. https://www.nber.org/system/files/working_papers/w27784/w27784.pdf
- Daehler, T. B., Aizenman, J., & Jinjarak, Y. (2021). Emerging markets sovereign CDS spreads during COVID-19: Economics versus epidemiology news. *Economic Modelling*, 100, Article 105504. <https://doi.org/10.1016/j.econmod.2021.105504>
- Dong, X., & Yoon, S.-M. (2019). What global economic factors drive emerging Asian stock market returns? Evidence from A dynamic model averaging approach. *Economic Modelling*, 77, 204–215. <https://doi.org/10.1016/j.econmod.2018.09.003>
- Fama, E. F., Fisher, L., Jensen, M. C., & Roll, R. (1969). The Adjustment of stock prices to new information. *International Economic Review*, 10(1), 1. <https://doi.org/10.2307/2525569>
- Ftiti, Z., Ben Ameer, H., & Louhichi, W. (2021). Does non-fundamental news related to COVID-19 matter for stock returns? Evidence from shanghai stock market. *Economic Modelling*, 99, Article 105484. <https://doi.org/10.1016/j.econmod.2021.03.003>
- Goodell, J. W. (2020). COVID-19 and finance: Agendas for future research. *Finance Research Letters*, 35, Article 101512. <https://doi.org/10.1016/j.frl.2020>
- Harjoto, Agus, M., Rossi, F., John, K., & Paglia. (2020). COVID-19: Stock market reactions to the shock and the stimulus. *Applied Economics Letters*, 28(10), 795–801. <https://doi.org/10.1080/13504851.2020.1781767>
- He, Q., Liu, J., Wang, S., & Yu, J. (2020). The impact of COVID-19 on stock markets. *Economics and Political Studies*, 8(3), 275–288. <https://doi.org/10.1080/20954816.2020.1757570>
- He, P., Sun, Y. L., Zhang, Y., & Li, T. (2020). COVID-19's impact on stock prices across different sectors-an event study based on the Chinese stock market. *Emerging Markets Finance and Trade*, 56(10), 2198–2212. <https://doi.org/10.1080/1540496x>
- Kang, W., Ratti, R. A., & Vespignani, J. (2021). Financial and nonfinancial global stock market volatility shocks. *Economic Modelling*, 96, 128–134. <https://doi.org/10.1016/j.econmod.2020.12.031>
- Khan, K., Zhao, H., Han, Zhang, Huilin, Yang, Muhammad Haroon, Shah, & Atif, Jahanger (2020). The impact of COVID-19 pandemic on stock markets: An empirical analysis of world major stock indices. *Journal of Asian Finance, Economics And Business*, 7(7), 463–474. <https://doi.org/10.13106/jafeb.2020.vol7.no7.463>
- Kizys, R., Tzouvanas, P., & Michael Donadelli. (2021). From COVID-19 herd immunity to investor herding in international stock markets: The role of government and regulatory restrictions. *International Review of Financial Analysis*, 74, Article 101663. <https://doi.org/10.1016/j.irfa.2021.101663>
- Krüger, P. (2015). Corporate goodness and shareholder wealth. *Journal of Financial Economics*, 115(2), 304–329. <https://doi.org/10.1016/j.jfineco.2014.09.008>
- Li, Q., Scollay, R., & Gilbert, J. (2017). Analyzing the effects of the regional comprehensive economic Partnership on FDI in A CGE framework with firm heterogeneity. *Economic Modelling*, 67, 409–420. <https://doi.org/10.1016/j.econmod.2017.07.016>
- Liu, H. Y., Manzoor, A., Wang, C. Y., Zhang, L., & Manzoor, Z. (2020). The COVID-19 outbreak and affected countries stock markets response. *International Journal of Environmental Research and Public Health*, 17(8), 2800. <https://doi.org/10.3390/ijerph17082800>
- Loipersberger, F. (2018). The effect of supranational Banking supervision on the financial sector: Event study evidence from europe. *Journal of Banking & Finance*, 91, 34–48. <https://doi.org/10.1016/j.jbankfin.2018.04.003>
- Marobhe, M. I., & Kansheba, J. M. P. (2022). Stock market reactions to COVID-19 shocks: Do financial market interventions walk the talk? *China Finance Review International*, 12(4), 623–645. <https://doi.org/10.1108/CFRI-01-2022-0011>
- Matos, P., Costa, A., & da Silva, C. (2021). COVID-19, stock market and sectoral contagion in US: A time-frequency analysis. *Research in International Business and Finance*, 57, Article 101400. <https://doi.org/10.1016/j.ribaf.2021.101400>
- Mezghani, T., Boujelbène, M., & Elbayar, M. (2021). Impact of COVID-19 pandemic on risk transmission between googling investor's sentiment, the Chinese stock and bond markets. *China Finance Review International*, 11(3), 322–348. <https://doi.org/10.1108/CFRI-08-2020-0120>
- Narayan, P. K., Dinh, H. B. P., & Liu, G. (2021). COVID-19 lockdowns, stimulus packages, travel Bans, and stock returns. *Finance Research Letters*, 38, Article 101732. <https://doi.org/10.1016/j.frl.2020.101732>
- Nguyen, Q. T. T., Anh, D. L. T., & Gan, C. (2021). Epidemics and Chinese firms' stock returns: Is COVID-19 different? *China Finance Review International*, 11(3), 302–321. <https://doi.org/10.1108/CFRI-03-2021-0053>
- Okorie, D. I., & Lin, B. (2021). Stock markets and the COVID-19 fractal contagion effects. *Finance Research Letters*, 38, Article 101640. <https://doi.org/10.1016/j.frl.2020.101640>
- Onali, E. (2020). COVID-19 and stock market volatility. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3571453>
- Pan, W.-F., Wang, X., Wu, G., & Xu, W. (2021). The COVID-19 pandemic and sovereign credit risk. *China Finance Review International*, 11(3), 287–301. <https://doi.org/10.1108/CFRI-01-2021-0010>
- Phan, D. H. B., & Paresh Kumar, N. (2020). Country responses and the reaction of the stock market to COVID-19-A Preliminary exposition. *Emerging Markets Finance and Trade*, 56(10), 2138–2150. <https://doi.org/10.1080/1540496x.2020.1784719>
- Rahman, Md. L., Amin, A., & Al Mamun, M. A. (2021). The COVID-19 outbreak and stock market reactions: Evidence from Australia. *Finance Research Letters*. <https://doi.org/10.1016/j.frl.2020.101832>
- Ramelli, S., & Wagner, A. F. (2020). Feverish stock price reactions to COVID-19. *The Review of Corporate Finance Studies*, 9(3), 622–655. <https://doi.org/10.1093/rcfs/cfaa012>
- Wang, Y.-H., Yang, F.-J., & Chen, L.-J. (2013). An investor's perspective on infectious diseases and their influence on market behavior. *Journal of Business Economics and Management*, 14(1), 112–127. <https://doi.org/10.3846/16111699.2012.711360>

- Xie, D., Cui, Y., & Liu, Y. (2021). How does investor sentiment impact stock volatility? New evidence from shanghai A-shares market. *China Finance Review International*. <https://doi.org/10.1108/CFRI-01-2021-0007>. ahead-of-print No. ahead-of-print.
- Yan, L., & Qian, Y. (2020). The impact of COVID-19 on the chinese stock market: An event study based on the consumer industry. *Asian Economics Letters*, 1(3). <https://doi.org/10.46557/001c.18068>
- Zaheer, K., Aslam, F., Tariq Mohmand, Y., & Ferreira, P. (2022). Temporal changes in global stock markets during COVID-19: An analysis of dynamic networks. *China Finance Review International*. <https://doi.org/10.1108/CFRI-07-2021-0137>. Vol. ahead-of-print No. ahead-of-print.