

The Effect of COVID-19 on the Stock Prices of the Big Four US Banks

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Pandemics risk governance

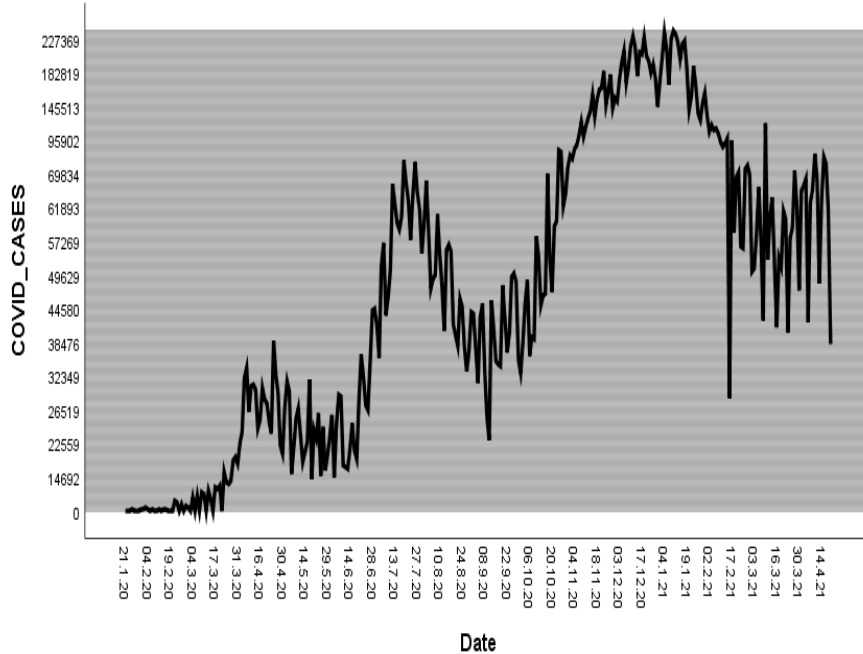
- ✓ The COVID-19 pandemic has caused severe health, economic, and social impacts around the world.
- ✓ ***Pandemics are unforeseeable and unpredictable risk events*** that can cause high level of damage.
- ✓ Companies need to build up and strengthen their pandemics risk reduction strategies.
- ✓ It is important to make companies and the society more resilient against pandemics.
- ✓ However, it is ***difficult to fully embrace pandemic risk in risk governance***.
- ✓ Thus, a first and important step is to understand the effects of pandemics as risk factors.
- ✓ One central risk factor to companies and society that can cascade across all economic entities: ***failure of banks***.
- ✓ Risk governance in banks should consider consequences of pandemics.
- ✓ ***Question: What happens to banks in case of pandemics?***

Background of the study I

- ✓ The first COVID-19 case in the U.S. was reported on January 20, 2020 (Heitmann et al., 2023).
- ✓ Bad market expectations can increase investor panic, lead to a drop in stock markets, and increase stock price volatility due to public health events like COVID-19 as evidenced from SARS and Ebola (Li, 2022).
- ✓ For example, Bank of America shares were trading at a price of \$35.35 at the beginning of 2020, which dropped to \$17.95 on March 23, 2020, during the COVID-19 pandemic (Benzinga, 2023).
- ✓ Interestingly, banks become the solution rather than the problem in the pandemic crisis and support the transmission of support of government and central bank for mitigating economic fall-outs (Beck, 2021; Giese & Haldane, 2020).
- ✓ Large banks have taken a prominent role in the global fight against the COVID-19 pandemic crisis especially serving large enterprises (Li, 2022).
- ✓ Only Big 4 U.S. banks represent 42.81 % of the consolidated assets of all 2,138 insured U.S.-chartered commercial banks with consolidated assets of \$300 million or more as of June 30, 2024 (Fed, 2024).

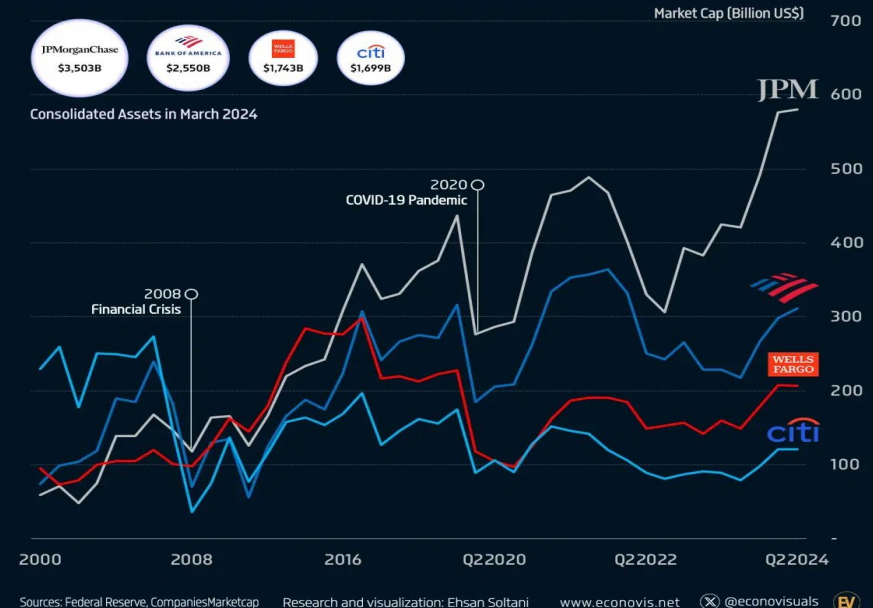
Background of the study II

Simple Line of COVID_CASES by Date



Data Source: World Health Organization (WHO), 2021

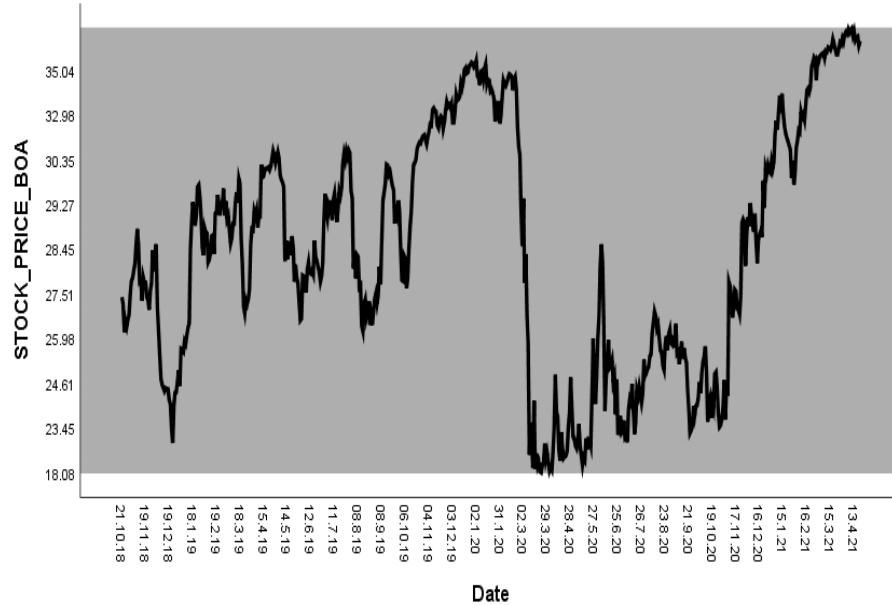
Market Capitalization of the
Four Largest U.S. Banks



Source: <https://www.voroniapp.com/markets/-Market-Capitalization-of-the-Four-Largest-US-Banks-20002024-1784>

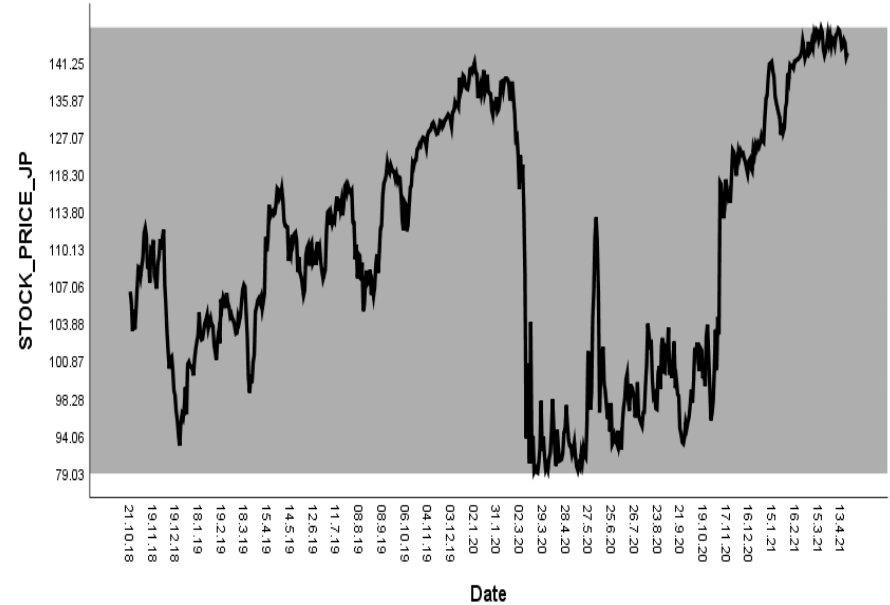
Background of the study III

Simple Line of STOCK_PRICE_BOA by Date



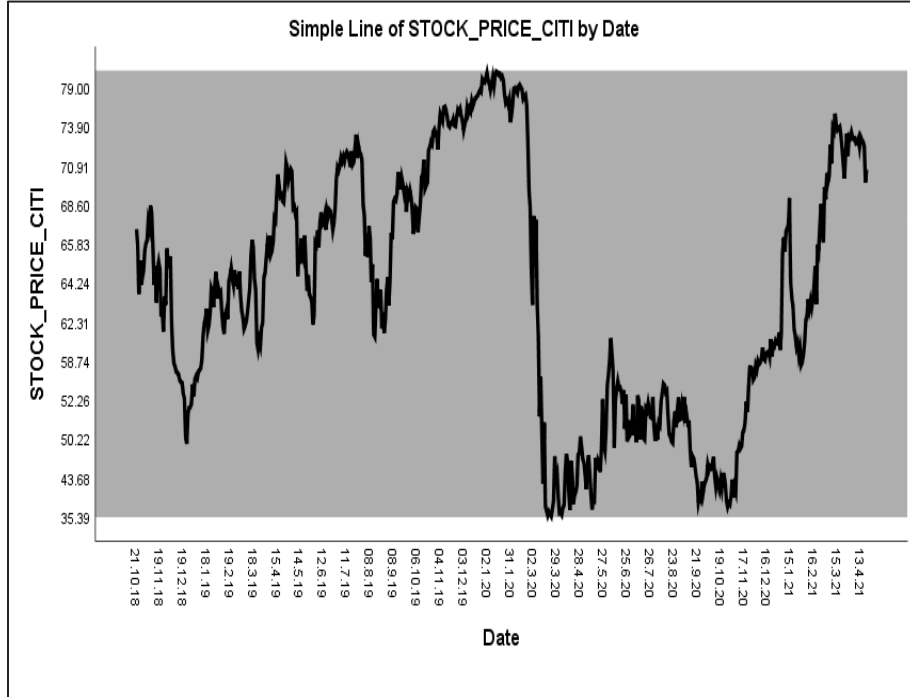
Data Source: The New York Stock Exchange (NYSE), 2021

Simple Line of STOCK_PRICE_JP by Date

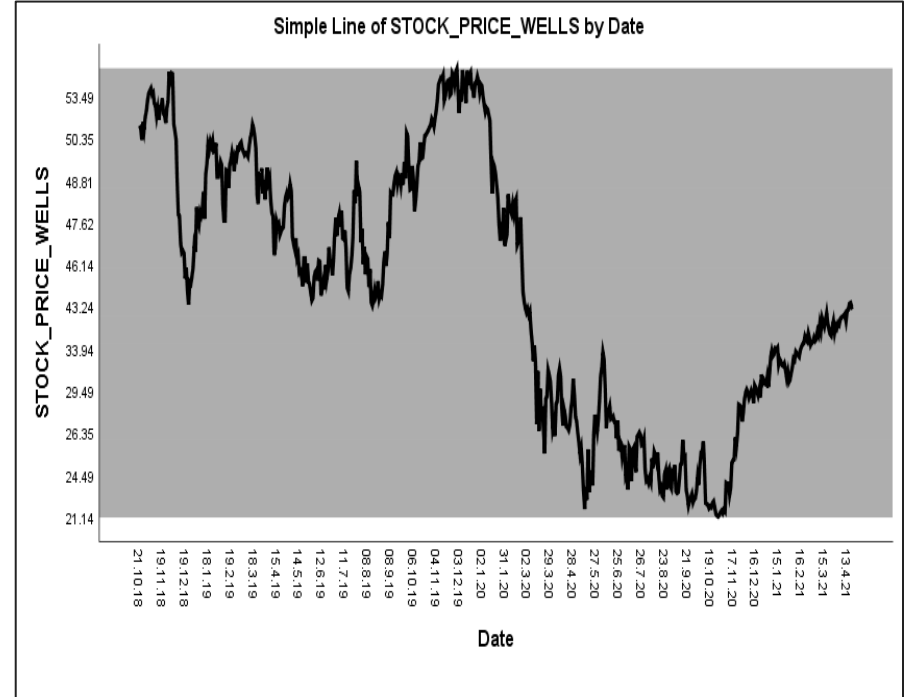


Data Source: The New York Stock Exchange (NYSE), 2021

Background of the study IV



Data Source: The New York Stock Exchange (NYSE), 2021



Data Source: The New York Stock Exchange (NYSE), 2021

Hypothesis development

- ✓ From previous graphs, it is evident that there are changes in the trends of daily closing stock prices of the four major US banks before and during the COVID-19 pandemic.
- ✓ It is unclear whether these changes are statistically significant and caused by COVID-19.
- ✓ Therefore, we have developed the following hypotheses to test this situation:

H1: COVID-19 has an effect on the stock price of JPMorgan Chase & Co.

H2: COVID-19 has an effect on the stock price of Bank of America.

H3: COVID-19 has an effect on the stock price of Wells Fargo & Co.

H4: COVID-19 has an effect on the stock price of Citigroup Inc.

Methodology

Research questions



- Is there any effect of COVID-19 on stock prices of the Big 4 U.S. banks?
- How much have the stock prices of the Big 4 U.S. banks been affected by COVID-19?
- How does COVID-19 affect stock price volatility of the Big 4 U.S. banks?

Data and sampling



- **Big 4 US banks**
 - Bank of America Corp.
 - JPMorgan Chase & Co.
 - Citigroup Inc.
 - Wells Fargo & Co.
- **Stock prices of 626 days**
 - 312 days before COVID-19 (October 2018 to January 2020)
 - 314 days during COVID-19 (January 2020 until April 2021)
- **Time series data**
- **Variable**
 - Stock Prices (in U.S. dollar)

Methodology



- **Test of hypothesis**
 - Mean difference
 - $H_0: \mu_1$ (No COVID-19) = μ_2 (COVID-19)
 - $H_1: \mu_1$ (No COVID-19) $\neq \mu_2$ (COVID-19)
- **Cohen's d**
 - Effect size
 - Cohen's $d = t \sqrt{\frac{N_1 + N_2}{N_1 N_2}}$
- **Stock price volatility**
 - Value at risk (VaR)
 - $VaR = (Z\text{-score} \times \text{Standard deviation}) + \text{Expected return } (\mu)$

Descriptive statistics

Variables	N	Mean (before COVID-19)	Mean (COVID-19)	SD (before COVID-19)	SD (COVID-19)	Mean Difference
Stock prices						
Bank of America Corp.	626	29.293	28.177	2.636	5.366	1.12
JPMorgan Chase & Co.	626	113.373	114.701	11.209	21.994	-1.33
Citigroup Inc.	626	67.238	56.098	6.275	11.586	11.14
Wells Fargo & Co.	626	49.246	30.736	2.880	7.407	18.51

Hypothesis testing

Banks	Mean Difference	Sig. (2-tailed)	t	Null hypothesis	Decision
Bank of America Corp.	1.12	0.00	3.30	Rejected	H₁ : COVID-19 has an effect on the stock price of Bank of America Corp.
JPMorgan Chase & Co.	-1.33	0.34	-0.95	Not Rejected	H₀ : COVID-19 has no effect on the stock price of JPMorgan Chase & Co.
Citigroup Inc.	11.14	0.00	14.94	Rejected	H₁ : COVID-19 has an effect on the stock price of Citigroup Inc.
Wells Fargo & Co.	18.51	0.00	41.15	Rejected	H₁ : COVID-19 has an effect on the stock price of Wells Fargo & Co.

Cohen's d

Big four US banks	d value	Interpretation	
		Effect size	d value
Bank of America Corp.	0.26 (small effect)	Small effect	0.20
JPMorgan Chase & Co.	-0.08 (no effect)	Medium effect	0.50
Citigroup Inc.	1.19 (large effect)	Large effect	0.80
Wells Fargo & Co.	3.29 (large effect)		

Value at risk (VaR)

Variable: Stock prices		Value at risk (VaR) Before COVID-19			Value at risk (VaR) COVID-19		
Significance level		1%	5%	10%	1%	5%	10%
Bank of America Corp.		24.12	24.87	26.48	20.08	21.63	22.66
JPMorgan Chase & Co.		96.49	99.92	101.39	84.03	88.92	91.03
Citigroup Inc.		51.78	55.70	61.38	38.12	41.52	42.54
Wells Fargo & Co.		44.37	45.26	45.67	21.83	22.92	23.87

Conclusion

- ✓ The stock prices of the three (out of four) major US banks have experienced a significant decline during the COVID-19 pandemic with the exception of JPMorgan Chase & Co.
- ✓ There appears to be higher volatility in stock prices for all the four banks during the COVID-19 period compared to the pre-pandemic period.
- ✓ The findings are important for banks' managements when considering epidemiologic aspects, like sudden pandemics, in their risk governance.
- ✓ Moreover, these insights are valuable for investors in making investments in bank stocks, as well as for policy makers in managing the effect of COVID-19 on stock prices.