Contents lists available at Science-Gate

International Journal of Advanced and Applied Sciences

Journal homepage: http://www.science-gate.com/IJAAS.html

The cascade effect: Are the U.S. economy and global stock markets vulnerable to the collapse of First Republic Bank?

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ARTICLE INFO

Article history:
Received 7 July 2023
Received in revised form
19 October 2023
Accepted 23 October 2023

Keywords:
First Republic Bank
Bank collapse
Event study
Abnormal returns
U.S. financial crises
Efficient market

ABSTRACT

Following the collapse of Silicon Valley Bank and Signature Bank, First Republic Bank collapsed and is considered the second-largest bank failure in U.S. history. These bank runs can have a cascading or contagion effect on other large banks, and U.S. banking crises can flare up again. We examine the effect of the First Republic bank run on top U.S. banks, U.S. stock indices, and global stock indices using standard event study methodology. We report abnormal returns and cumulative abnormal returns for the event day (t = May 01, 2023) and the 10-day event window (t-5 to t+5), respectively, using data from the 120-day estimation window. The results indicate that on the event day, only JP Morgan Bank's returns were negative, while other banks acted as safe havens for investors. No significant change in returns on the event day is observed for U.S. sector indices (except for the healthcare sector) and global stock exchanges, except for the European and Chinese markets. During the event window, the occurrence of the event significantly affects bank returns after the event date, but no significant effect is found before the event date. Similarly, the healthcare and transportation sectors are more affected than other sectors, while the U.S. and Canadian stock markets seem to be more susceptible to the bank run. Overall, the results suggest that the U.S. government should take decisive initiatives to stop the ripple effect and protect the entire financial system.

1. Introduction

Banks and financial institutions play an important role in promoting economic development by providing loans and taking deposits from businesses and individuals. When a bank fails, the local and global economic environment faces a downturn, the credit market becomes tighter, getting finance becomes more difficult for businesses and, most importantly, it leads to a loss of public confidence in the financial system, which consequently persuades depositors to withdraw their funds and force investors and withdraw their investments (Jokipii and Monnin, 2013). This triggers the domino effect as other financial institutions will be reluctant to lend money in the market which limits their earnings (Yadav et al., 2023).

The United States (U.S.) is now facing severe economic turmoil, especially after the collapse of the First Republic Bank which had been under pressure after the collapse of Silicon Valley Bank (SVB) and Signature Bank in March 2023. Earlier, the CEO and Chairman of JPMorgan Chase, Jamie Dimon, optimistically anticipated that the turbulence in the U.S. banking sector was about to end and things would become stabilized. On March 13, President Joe Biden assured the public that the American banking system is safe and the government is responding in a decisive manner to the failure of two recent banks to protect depositors and stabilize the economy. Despite these assurances, on April 24, the earning reports of First Republic Bank revealed that its deposits tumbled 40% when the clients withdrew $104.5 billion after realizing their money was unsafe. On May 01, the U.S. government regulators took possession of First Republic and JP Morgan Chase

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https://doi.org/10.21833/ijaas.2023.11.008
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won the weekend auction after the competitive bidding process and acquired about $92 billion in deposits and all of its major assets. Furthermore, the acquisition will add over $500 million of profit annually to JPMorgan, excluding the one-time costs. Since the financial crisis of 2008, it has been the biggest bank failure in the U.S. economy which has shaken up the entire U.S. banking system. The seizure of First Republic has sparked fear among market participants on Wall Street that more banks could fail in the future.

First Republic was founded in 1985, based in San Francisco, California, and ranks among the top fifteen U.S. banks in 2022 with total assets of $205.11 billion and 84 branches in eight states in the U.S. There are some major reasons and serious issues that cause this bank run such as its funding sources, significant loan growth, and asset quality. The main reason was the huge maturity and value mismatch between the bank's assets and liabilities. The bank takes money from depositors (a liability) and lends it to the public (an asset) to earn interest against cheap mortgages. The money was lent at prevailing interest rates when they were low, but when interest rates were suddenly raised by the Federal Reserve last year, this model did not adjust well as it reduced the value of these loans and ultimately existing loans become worthless at low-interest rates. This issue is affecting other U.S. banks to varying degrees, but the intensity of the impact is much greater at First Republic. This business model of First Republic looked a bit more precarious, especially after the shock waves from the collapse of SVB and Signature Bank. This raised the question of whether First Republic's assets would be sufficient to meet deposit claims. The bank had been reporting poor earnings for a number of years, and everyone began to see First Republic as the next risky bank in the financial system. The situation became more serious after the bank released its latest financial results, which gave a sense that the bank was increasingly at risk of being seized, as a result, on March 8, its share price plummeted 87% when the financial market learned of SVB's impending demise. Finally, the Federal Deposit Insurance Corp. orchestrated the deal and sold its major assets, loans, and bonds to JPMorgan Chase in the early morning of May 01, allowing First Republic to continue as part of JPMorgan. This resulted in the loss of the shareholders' investment. The first week of May 2023 was anxious and nerve-wracking for the depositors, although the U.S. regulators stepped in to ensure that the depositors were protected, on the other hand, the shareholders lost their investment.

Similar to bank failure and its costs, several events have happened around the world including regulatory amendments, corporate reforms, and macroeconomic shocks and many studies have attempted to investigate the significant consequences of those events on the capital market, financial structure, and economic stability. Alabbad and Schertler (2022), for example, examined the response of banks' profits and stock prices during COVID-19, and by using the event study methodology and two-way fixed-effect regression they found that the change in income level and the response of stock prices of Islamic and conventional bank were almost similar. Fernandez-Perez et al. (2021) investigated the impact of national culture on the equity market during COVID-19 and revealed that the culture of different economies has a significant influence on abnormal returns. The effect of the global pandemic on the capital market of the top six affected economies was examined by Ganie et al. (2022) and Pandey and Kumari (2021) for developed and emerging economies and they observed high volatility and significant abnormal returns among selected sample indices. Using the wavelet-based quantile-on-quantile method, Gao et al. (2022) compared the impact on the stock markets of the U.S. and China during the COVID-19 pandemic, exploring the high leverage effect in both markets. Similarly, the investigations of Heyden and Heyden (2021), Mazur et al. (2021), and Omar et al. (2022a) also explored the negative effects of the global pandemic on different stock markets. For the Russia-Ukraine war, Abbassi et al. (2023) investigated the impact on stock indices of the G7 economies, revealing negative abnormal returns of especially trade-dependent entities. Boubaker et al. (2022) and Kumari et al. (2023) examined the impact of the Russia-Ukraine war on NATO countries and the European Union stock market. The former found higher returns for NATO economies while the latter found positive cumulative abnormal returns post-event. In the same way, the impact of the breakout between Russia and Ukraine on different stock markets was also examined on different stock markets by using the event study methodology by Chortane and Pandey (2022), Sun and Zhang (2022), and Yousaf et al. (2022), indicating a severe negative impact of this conflict on the event day and post-event period. Finally, Conlon et al. (2020), Dai et al. (2023), and Sami and Abdallah (2021) investigated the impact of cryptocurrency on the capital market, while on the other hand, Akyildirim et al. (2023), Yousaf et al. (2023b), and Yousaf and Goodell (2023a) examined the effect of the fall of FTX.

Particularly, the recent fall of SVB attracted the authors' attention to examine its local and global effects on financial and economic environments such as Anwer et al. (2023). The impact of SVB collapse has been analyzed by Yadav et al. (2023) on nine global equity indices; Yousaf and Goodell (2023b) on eleven U.S. market sectors, Yousaf et al. (2023a) on equity indices, fiat currencies, metals, energy and cryptocurrencies.

Motivated by these studies, we contribute to the existing literature by undertaking an investigation into the effect of the largest bank collapse of the First Republic since 2008 on the U.S. economy and global equity market. We employ daily data from the top ten U.S. banks, five U.S. equity indices representing different sectors, and five global equity indices to examine how they reacted to the First Republic collapse. This study has some key contributions to

the existing body of literature. Firstly, to the best of the authors' knowledge, this is the first attempt to analyze the impact of First Republic's failure on top U.S. banks, U.S. equity sectors, and global equity exchanges. Secondly, we are primarily concerned with examining the effect of bank runs on top U.S. banks because two large U.S. banks, the SVB and Signature banks, recently collapsed and it is the third largest failure in U.S. history since the 2008 financial crises which may have severe consequences on the resilience and stability of financial structure and may lead to contagion effect by wrapping up other large U.S. banks. Thus, examining the effect of the First Republic collapse on the U.S. banking system is imperative and much needed especially after this bank run incident. Finally, since the stock market and banking sector are closely interrelated with each other (Khoj and Akeel, 2020; Omar et al., 2022b), we also observed the shocks on U.S. equity indices and global equity indices to examine the local and global impact of bank run. Our study is based on the efficient market hypothesis (EMH) presented by Fama (1970) which states that stock prices quickly react to the newly available information and prices respond according to the nature of the event. For example, the stock price of JPMorgan rose by 3.3% at midday when JPMorgan formally won the auction deal. We used the event study methodology proposed by MacKinlay (1997) which has been employed by many recent studies (Yadav et al., 2023; Yousaf and Goodell, 2023b; Yousaf et al., 2023a). Following the methodology, we define the event day (i.e., May 01, 2023), 10-day event window from t-5 (April 24, 2023) to t+5 (May 08, 2023) and 120 trading-days estimation window ranging from t-125 (October 28, 2022) to t-6 (April 21, 2023). We calculate abnormal returns for the event day and cumulative abnormal returns (CAR) for the event window and their significance is statistically tested. The findings of the study reveal that, on the day of the bank run, most of the banks acted as a safe haven for investors as they diverted towards alternate investment options, especially after appearing the seizure symptoms in the last week of April 2023. On the other side, U.S. and global equity exchanges were less affected. Furthermore, during the event window, the CARs were significantly and persistently negative for most of the top U.S. banks, especially after the event but had a slight impact before the event. Likewise, the healthcare sector and the U.S. equity index (i.e., DJIA) were also largely affected by the bank run. The findings of the study could notify investors and policymakers about the expected risk associated with the U.S. banking industry and global equity market and assist them in formulating and implementing robust credit policies to save investors and the economy. Furthermore, in light of the obtained results, investors could make informed investing decisions and manage their portfolios to minimize risk by taking valuable insight into the banking, financial, and equity sectors. The remainder of the paper is organized as follows. Section 2 explains the data and methodology used in the study, section 3 reports the obtained results and discussion. Finally, the whole study is concluded in section 4.

2. Data and methodology

2.1. Data

This study uses the daily data of U.S. Banks including JPMorgan Chase (JPM), Bank of America (BOA), Citibank, Wells Fargo, U.S. Bancorp, PNC Financials (PNC), Truist Financial (Truist), Goldman Sachs (GMS), TD Bank, and Capital One. They are the largest and top U.S. banks based on total assets during 2022 as illustrated in Fig. 1. Furthermore, we take daily data of five indices from U.S. equity sectors containing Dow Jones healthcare, Dow Jones oil and gas (Oil and Gas), Dow Jones technology (Tech), NASDAQ telecom (Telecom) and NASDAQ transportation (Transportation) as they are the dominant sectors of U.S. economy. In addition, to see the global impact of bank failure, we use the daily data of five global equity indices including the Dow Jones Industrial Average (DJIA), Euro Stoxx 50 (Euro Stoxx), FTSE 100 (FTSE), SandP/TSX Composite (SandP/TSX), and SZSE Component (SZSE) representing USA, Euro Zone, UK, Canada and China respectively. All data is gathered from Datastream and www.investing.com.

2.2. Methodology

We follow the standard event study methodology proposed by MacKinlay (1997) to analyze the effect of the First Republic bank run on the U.S. economy and global equity market. It aids in analyzing the effect of different types of events (like corporate restructuring, and economic shocks) on share prices as the market value of corporations is pronounced by those events. Firstly, the *event day* must be determined, usually, the announcement day of the event occurs. Secondly, the range of the event period must be defined which involves the event day and encompasses the surrounding timeframe in which the share prices are likely to be affected by the event, normally referred to as the *event window*. Finally, the estimation period is defined with the intention to estimate market model parameters, referred to as a pre-event window or *estimation window*.

Provided that, the bank run on the First Republic was announced on May 01, 2023, so, it is determined as the event day. We used a 10-day event window from t-5 (April 24, 2023) to t+5 (May 08, 2023) and 120 trading-days estimation window ranging from t-125 (October 28, 2022) to t-6 (April 21, 2023) as depicted in Fig. 2. We calculate the actual returns of assets' series as:

$$R_{it} = \left[\frac{P_{it} - P_{it-1}}{P_{it-1}}\right] \text{x } 100 \quad (1)$$

where, R_{it} is the daily actual returns of asset i in time t, P_{it} and P_{it-1} is the closing price of asset i at time t

and time *t-1* respectively. In addition to that, we calculate the expected (mean) return of the selected asset series by taking the average of the actual returns during the estimation period using the following method.

$$\bar{R}i = \frac{1}{n}\left[\sum_{t=-125}^{-6} R_{it}\right] \quad (2)$$

where, $\bar{R}_i$ is the expected return of the asset *i* and *n* is the number of total observations. We calculate abnormal returns (AR_{it}) of the event period by subtracting the mean return from actual returns as follows.

$$ARit = Rit - \bar{R}I \quad (3)$$

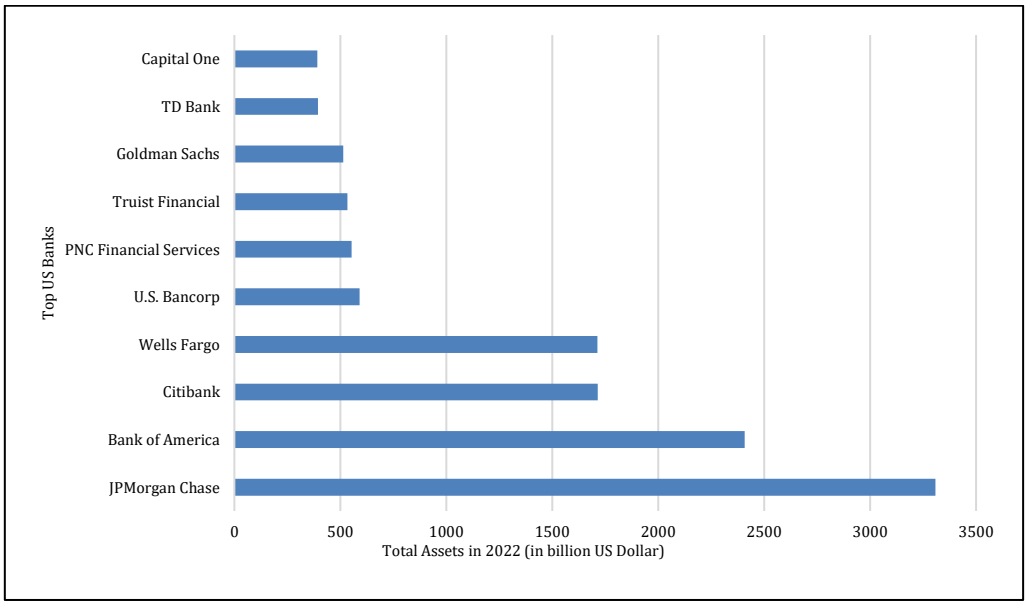

Fig. 1: Top ten U.S. banks as per total assets in 2022

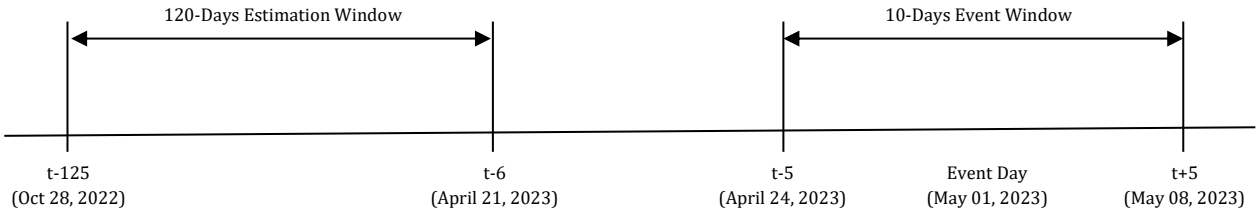

Fig. 2: Timeline of the event

Finally, cumulative abnormal returns (*CARs*) are calculated for asset *i* over the event window period between η_1 to η_2 as shown in the following formula:

$$CARi\ (\eta 1, \eta 2) = \sum_{t=\eta 1}^{\eta 2} AR_{it} \quad (4)$$

To get a deeper insight, we calculate the average aggregate abnormal returns for all assets collectively along each day of the event window as shown below:

$$AARt = \frac{1}{n}\left[\sum_{i=1}^{N} AR_{it}\right] \quad (5)$$

where, AAR_t is the average value of aggregate abnormal returns and *N* is the total number of assets used in the current study. Finally, by using the obtained AAR_t values, we calculate cumulative aggregate abnormal returns ($CAAR_t$) for each day of the event window using the following method.

$$CAARt\ (¢1, ¢2) = \sum_{t=¢1}^{¢2} AAR_t \quad (6)$$

where, $CAAR_t$ (∂_1, ∂_2) denotes the cumulative aggregate abnormal returns covering the event window time frame between ∂_1 and ∂_2. Finally, the significance of the abnormal returns is calculated using the *t*-statistics by following the equation below.

$$t\text{-}statistics = \frac{AR_t}{Standard\ Error\ (SE)} \quad (7)$$

where, $SE = \frac{\sigma AR_t}{\sqrt{n}}$.

3. Results and discussion

Abnormal returns for the event day of all assets are illustrated in Table 1 and depicted in Fig. 3. For top U.S. banks, the abnormal returns of U.S. Bancorp, PNC, and Capital One are positive at α=1% while Truist returns are positive at α=10% with the exception of JPM having highest negative abnormal return at α=1%. This suggests that banks with positive returns acted as a safe haven for investors. Apart from that, Euro Stoxx and SZSE exhibit positive returns at α=1% whereas only the healthcare sector exhibits significant negative returns at α=5%. Overall, the results show that most of the assets are

not significantly (either positively or negatively) affected by the bank run of First Republic on the event day. These findings are consistent with Anwer et al. (2023) and Yousaf et al. (2023a) who also demonstrated the little effect on different classes of assets by the bank run of SVB on the event day which synthesizes that impact of a bank run is not on total contagion rather limited to the specific factors.

Table 1: Abnormal returns of all assets on the event day

	AR	t-statistics		AR	t-statistics
Panel A: Top U.S. banks					
JPM	-2.006***	-3.520	PNC	6.530***	6.248
BOA	0.657	0.707	Truist	3.087*	1.733
Citibank	-0.329	-0.439	GMS	0.833	1.342
Wells Fargo	-1.679	-1.502	TD Bank	0.140	0.291
U.S. Bancorp	3.876***	2.706	Capital One	4.355***	3.890
Panel B: U.S. equity exchanges					
Healthcare	-0.580**	-2.281			
Oil and Gas	1.170	1.355			
Technology	-0.007	0.042			
Telecom	0.017	-1.146			
Transportation	-0.654	-1.225			
Panel C: Global equity indices					
DJIA	0.181	0.597			
Euro Stoxx	1.649***	6.668			
FTSE	-0.405	-1.591			
SandP/TSX	0.149	0.618			
SZSE	0.864***	3.098			

***, **, and * indicate the level of significance at 1%, 5%, and 10% respectively; AR: Abnormal returns

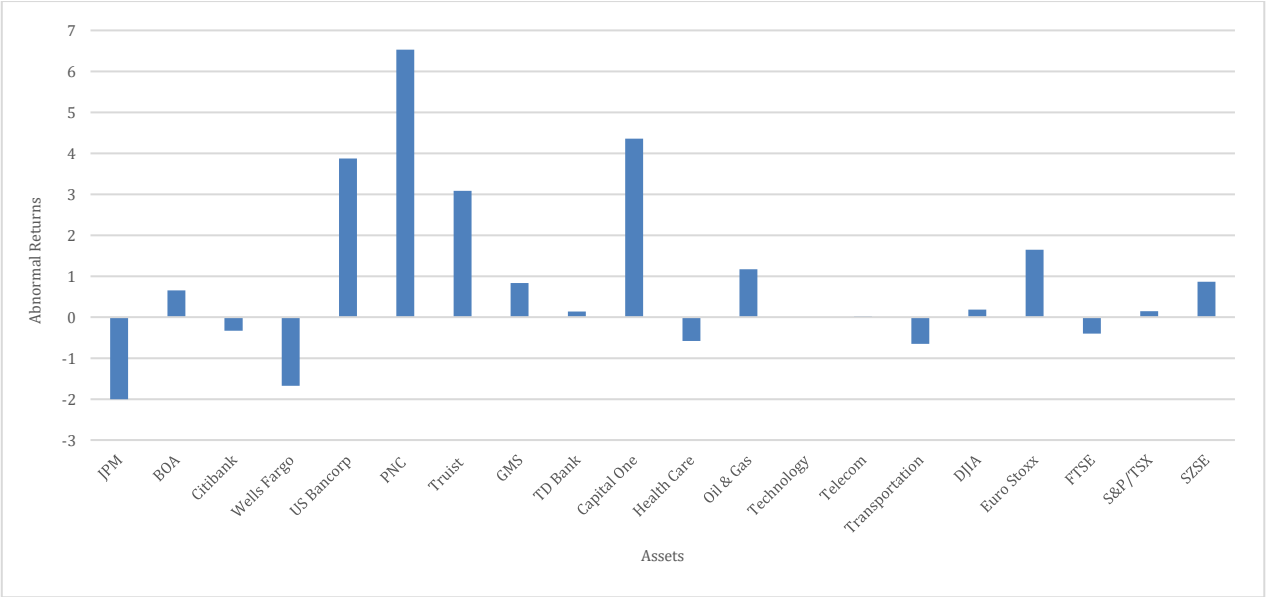

Fig. 3: Abnormal returns of all assets on the event day

Table 2 exhibits the *CARs* of the top ten U.S. banks during the event window. The results are exactly in line with the conjecture that U.S. banks are likely to be victimized by the bank run of the First Republic. As can be seen, for example, JPM reports significant negative *CARs* consecutively after the second day of the event occurrence at α=1%. Most importantly, but not surprisingly, the patterns of significant negative *CARs* after the third day of the event for all other banks can be easily observed and these results are consistent with Yousaf et al. (2023a). One plausible justification for these results is First Republic belongs to the banking industry which is likely to be more affected by any bank run than any other market. On the contrary, most of the banks show the minimal effect of bank run on *CARs* prior to the event with the exception of a few indicating the limited effect of the incident on banks as other factors might hinder the plausible incident effect on selected banks. Overall, the finding shows the returns of top U.S. banks are seriously hit by the bank run shock and have a considerable influence on the U.S. banking industry. These findings draw attention to the significance of the banking industry to the economy (Moshirian and Wu, 2012).

The CARs of U.S. equity sector indices are demonstrated in Table 3. It is evident that the bank run has a consistently significant negative effect on the returns of the Healthcare sector three days before the event at α=1%, 5%, or 10%, except in t+2. The most affected sector is oil and gas with the highest significant negative returns at α=1% on the fourth and fifth day after the event. The least affected sectors are Tech and Telecom with positive returns on most of the days. Finally, the Transportation sector is also affected by the bank run event with negative returns in most of the days. Overall, on average, all the selected sectors are significantly

affected by bank run events and the findings are contrary to Yousaf and Goodell (2023b).

The response of the global equity market to bank run is depicted in Table 4. The results are intriguing regarding significant negative and positive *CARs* as no persistent pattern of returns is observed over the event window among global equity indices. For example, although the DJIA returns from t-4 to t+4 are statistically significant at α=1% or α=5%, they were positive on only three days (t-4, t-1, t+1) and negative on the remaining days. The third day after the event is a day when the CARs of all indices are significantly negative.

Table 2: Cumulative abnormal returns (CARs) of top U.S. Banks during the event window

	JPM	BOA	Citibank	Wells Fargo	U.S. Bancorp	PNC	Truist	GMS	TD Bank	Capital One
t-5	1.099	-1.188	0.860	-0.599	0.120	-2.311	-1.823	-0.220	0.158*	-0.010
	(-0.079)	(0.216)	(0.014)	(-0.538)	(1.420)	(-0.907)	(-0.772)	(-1.091)	(1.909)	(0.163)
t-4	1.144*** (4.057)	-1.389***	0.850***	0.002*	-1.913**	-1.363	-0.448**	0.457**	-0.766***	-0.193
		(3.250)	(3.267)	(1.900)	(2.107)	(0.219)	(2.409)	(2.110)	(5.501)	(1.238)
t-3	-1.167*** (3.323)	-4.410	-1.602***	-2.122**	-4.932	-1.592***	-4.740	-0.853	-3.430	-1.579
		(1.331)	(3.025)	(2.385)	(0.420)	(-3.328)	(-0.467)	(1.382)	(-0.085)	(0.432)
t-2	-3.062**	-5.647*	-3.873	-4.789	-5.533**	1.885	-3.908	-1.711**	-3.389	-2.063
	(-2.172)	(-1.857)	(-0.413)	(-0.536)	(-2.384)	(-0.349)	(-1.550)	(-2.390)	(-3.127)	(-1.530)
t-1	-1.823	-3.921	-3.563	-4.19	-2.117***	2.250*	-1.147**	-0.227	-1.875	-0.351
	(-1.353)	(-1.615)	(-0.045)	(-0.288)	(-3.616)	(-1.860)	(-2.222)	(-0.877)	(-0.868)	(-1.271)
t+1	0.953***	-3.078*** (3.180)	-3.199***	-2.188***	-0.813***	-2.336**	-0.275***	-0.516***	-1.595***	-3.283***
	(3.037)		(3.689)	(3.483)	(5.130)	(2.075)	(4.471)	(3.462)	(3.384)	(3.541)
t+2	-0.777***	-6.034 (0.977)	-5.968	-6.084	-8.162*	-4.504*	-8.240*	-2.667**	-3.234	-7.248
	(3.950)		(1.031)	(0.354)	(1.810)	(1.820)	(1.820)	(2.297)	(-0.914)	(1.473)
t+3	-3.029***	-6.941***	-6.742**	-6.480***	-10.755*	-6.407**	-11.484***	-4.094***	-2.792**	-8.897**
	(2.590)	(3.286)	(2.353)	(4.615)	(1.841)	(2.312)	(3.957)	(3.688)	(-2.035)	(2.434)
t+4	-4.506***	-9.9964***	-8.509***	-11.641***	-13.39***	-8.824**	-18.533***	-6.385***	-1.806***	-11.623**
	(-3.204)	(-2.977)	(-4.016)	(-2.961)	(-4.131)	(-2.314)	(-5.006)	(-2.850)	(-6.453)	(-2.484)
t+5	-2.679***	-7.229***	-5.495***	-8.330***	-7.476***	-6.406***	-9.613***	-4.615***	1.318***	-8.842***
	(-4.701)	(-7.77)	(-7.321)	(-7.449)	(-5.219)	(-6.129)	(-5.396)	(-7.429)	(2.723)	(-7.897)

t-statistics are given in parenthesis; ***, **, and * indicate the level of significance at 1%, 5%, and 10% respectively

Table 3: Cumulative abnormal returns (CARs) of U.S. equity sector indices during the event window

	Healthcare	Oil and gas	Tech	Telecom	Transportation
t-5	0.001*	-0.931*	2.006	0.572	0.929
	(-1.771)	(-1.785)	(0.947)	(0.630)	(-0.305)
t-4	0.452***	0.610**	1.499***	0.310	1.103***
	(4.428)	(2.190)	(4.522)	(1.217)	(3.710)
t-3	-0.674***	-1.281	-0.920***	-0.195	-1.015***
	(5.543)	(1.479)	(-2.604)	(1.615)	(6.719)
t-2	-2.083*	-2.559	0.473***	-0.867***	-4.853***
	(-1.797)	(-0.597)	(-4.760)	(-8.069)	(-3.723)
t-1	-1.626***	-2.043*	3.020	2.488*	-2.727
	(-3.217)	(-1.667)	(-1.168)	(-1.901)	(-3.341)
t+1	-0.228**	-1.774***	3.652**	3.261***	-0.164**
	(2.484)	(5.042)	(2.346)	(4.595)	(2.237)
t+2	-0.860	-6.130**	2.396	1.350	-1.442
	(0.161)	(2.229)	(1.608)	(1.493)	(-0.254)
t+3	-0.901***	-8.056	1.535	0.73	-1.297**
	(3.069)	(1.157)	(1.079)	(1.609)	(2.530)
t+4	-1.681***	-9.055***	0.958***	0.060**	-2.742***
	(-3.683)	(-3.201)	(-4.017)	(-2.275)	(-3.377)
t+5	-0.744***	-6.289***	3.108***	1.006**	-0.813
	(-2.928)	(-7.280)	(5.808)	(2.421)	(-1.424)

t-statistics are given in parenthesis; ***, **, and * indicate the level of significance at 1%, 5%, and 10% respectively

Table 4: Cumulative abnormal returns (CARs) of global equity indices

	DJIA (USA)	Euro Stoxx (Euro Zone)	FTSE (UK)	SandP_TSX (Canada)	SZSE (China)
t-5	0.391	1.739	0.948	0.575	1.526***
	(-0.520)	(1.223)	(-0.219)	(0.516)	(4.518)
t-4	0.548***	1.437***	1.004	0.450***	0.265***
	(3.520)	(2.811)	(0.447)	(4.968)	(5.693)
t-3	-0.517**	0.742***	0.890	-0.753*	-1.323
	(2.412)	(3.402)	(1.399)	(1.670)	(-0.882)
t-2	-1.248***	-0.099	0.534**	-1.158***	-1.077
	(-4.990)	(-0.361)	(2.274)	(-2.944)	(-0.708)
t-1	0.263**	-0.01	-0.045	-0.445**	-0.879***
	(-2.503)	(0.482)	(1.406)	(-2.087)	(-3.553)
t+1	0.841***	-1.778	0.001***	-0.088***	-0.752
	(3.722)	(-0.839)	(5.272)	(4.383)	(1.035)
t+2	-0.286***	-1.570***	-1.342	-1.151	-1.041
	(2.802)	(2.782)	(-0.421)	(1.260)	(-1.185)
t+3	-1.135***	-2.258***	-1.235***	-1.457**	-0.710***
	(2.983)	(-4.376)	(4.716)	(2.562)	(3.274)
t+4	-2.039***	-1.176	-2.438***	-2.078***	-1.624
	(-5.223)	(-0.166)	(-3.467)	(-5.911)	(-1.141)
t+5	-0.456	-1.135***	-1.554***	-0.645***	-1.305***
	(-1.508)	(-4.592)	(-6.094)	(-2.660)	(-4.680)

t-statistics are given in parenthesis; ***, **, and * indicate the level of significance at 1%, 5%, and 10% respectively

Consistent with Pandey et al. (2023), almost all indices show statistically significant negative returns after the bank run period at α=1% or α=5%. Similarly, in contrast with Yadav et al. (2023), FTSE and SandP_TSX recorded continuous significant negative returns from the third day of the event.

Canadian market exhibits maximum significant negative returns over the event period. Contrary to the finding of Yousaf et al. (2023a), the European market shows a significant impact of the event. These results suggest that the global stock market significantly absorbed the First Republic bank run event shock during the event window, confirming that these markets are efficient. Finally, the average aggregate effect of a First Republic collapse on all assets over the event window period is estimated by adding the abnormal returns and *CARs* across assets along the day period and illustrated in Table 5. It is noticed that in the whole period (except on t-3 and t), the aggregate abnormal returns (*AARs*) of all assets are significant with positive or negative returns at α=1%, 5%, or 10%. In contrast, after the second day of the event, the cumulative *AARs* of all assets consistently exhibit statistically significant negative returns at α=1% which states that selected assets are adversely influenced by the bank run of First Republic.

Table 5: Average values of aggregate AR and CARs of all assets during the event window

	AAR	t-stats (AAR)	CAAR	t-stats (CAAR)
t-5	-0.011	-0.019	0.192	0.317
t-4	1.777***	3.142	0.203	0.335
t-3	0.677	1.198	-1.574***	-2.599
t-2	-1.303**	-2.304	-2.251***	-3.718
t-1	-1.173**	-2.074	-0.948	-1.566
t	0.892	1.578	0.224	0.370
t+1	2.481***	4.389	-0.668	-1.103
t+2	0.970*	1.716	-3.150***	-5.201
t+3	1.731***	3.061	-4.120***	-6.804
t+4	-2.441***	-4.318	-5.851***	-9.663
t+5	-3.41***	-6.030	-3.409***	-5.631

***, **, and * indicate the level of significance at 1%, 5%, and 10% respectively; CAAR: Cumulative aggregate abnormal returns; AAR: Aggregate abnormal returns

4. Conclusion and implications of the study

This study examines the impact of the First Republic collapse on the top U.S. banks, U.S. stock sectors, and global stock indices. The results show that on the day of the event, only JPM was negatively affected by the bank run, while U.S. Bancorp, PNC, and Capital One functioned as safe havens for investment. Furthermore, the healthcare sector shows positive abnormal returns, while the Euro Stoxx and SZSE stock exchanges show negative abnormal returns on the event day. Similarly, almost all banks exhibit negative impact of bank run after the event, but before the event the impact is minimal, which means that more bank failures may happen in the next big waves, highlighting the prospects of contagion effect. The healthcare sector is highly affected while the telecom sector is relatively less affected by the bank failure in the event window. The positive and negative impact of the event on global stock indices is mixed but significant as DJIA is adversely affected while FTSE is least affected by the bank run. The study has some important practical implications. The results of the study suggest that the U.S. government should take strict initiatives, develop strict borrowing rules, and control interest rates to prevent a chaotic collapse that may lead to banking crises. Overall, the results suggest that the U.S. government should take decisive initiatives to stop the ripple effect and protect the entire financial system.

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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