



Evidence from International Financial Markets on Stock Market Liquidity During Times of Distress and Its Consequence

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ABSTRACT

Old-fashioned ways to price things believe that the buying and selling of goods happen without any difficulties and there is always enough money available in the market this way of thinking has some weaknesses because it can't clarify all the issues that come with the lack of buyers and sellers in the security market. This study wanted to understand how easy it is to sell stocks during tough times in the economy. We used a special model to study how easy it was to buy and sell things in different stock markets during two big events - the financial crisis in 2007-2008 and the Covid-19 outbreak. We looked at five specific stock markets: CAC 40, DAX, JSE, Nasdaq Index, and Nikkei-225. The time when we looked at things was from January 1, 2020 to December 31, 2021 and from December 1, 2007 to June 30, 2009. Despite the financial crisis, some financial markets had enough money to keep trading. However, the Nasdaq index was an exception and couldn't keep up. On the other hand, all the money markets we looked at had a hard time being able to turn investments into cash during the covid-19 pandemic. This could be because people need to have more money to trade and it's harder to know everything about what's happening in the market

INTRODUCTION

When thinking about buying and selling stocks, it's important to look at market liquidity. This means how easy it is to make trades and get out of the market. We've had some big problems with money in the financial markets a few times. These were called Black Monday in 1987, Junk Bond in 1988, Japanese Bubble in 1990, and United States Bond Crash in 1994.

There were some big problems in different parts of the world during the years 1995 to 2007. These included things like financial crises and events like September 11th that caused disruptions. Some countries, like Mexico and Argentina, had economic problems. And there were also issues with big companies and investing that caused problems, like the Dotcom crash and the Long-term Capital Management issue. Finally, there was a global problem with credit and money that caused even more issues. Financial problems caused by a lack of money are common and keep happening. It's sensible to be careful when thinking about how easy it is to buy and sell things in the stock market. We should expect that there may not always be enough buyers or sellers around when we want to trade.

What will happen later on. In finance, people use different ways to describe getting money and how much is available in the market. Funding liquidity means if there is enough money available to borrow. Market liquidity is important when analyzing financial markets because people think that the basics of the market are usually based on how easy it is to buy and sell things. Previous studies have shown that how easy it is to buy and sell stocks (market liquidity) is important in predicting how the market will do when companies announce their earnings. Stock market liquidity means that people are ready to buy and sell stocks, which makes the trading more valuable and popular. Basically, people who participate in the market can easily buy or sell their shares because they can easily access it.

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Keep the market index visible and easy to read all the time. If people aren't willing to trade, there may not be enough trading and that could cause problems with getting the money we need. There are two main reasons why a liquidity crisis happens: no one wants to buy or partner with a company, or they are forced to sell things for less than they're worth. When people are experiencing money troubles, they often sell their things like stocks or property in order to make up for the money they are losing because of the economy being bad. In times of financial problems, many people want to sell investments, but there aren't enough buyers. This makes it hard to trade, so it's called illiquidity. If a business's balance sheet is not set up properly, it can cause problems when trying to pay bills and manage cash flow. When things don't match up, investors get worried and this makes prices go up or down. This means that when investments are hard to sell, there are three main risks that can affect how much you make: 1) not having investments that mature at the right time, 2) investing in risky companies, and 3) investing in foreign currencies. We need to remember that these weaknesses are the key that shows how people feel in the money world. Besides

the lines that indicate problems, how easily stocks can be bought and sold also depends on how the financial market is set up. This means how much you are limited, how good the technology is, and how much you can see in the market. These unique characteristics are important because when you trade in the financial markets, you have to consider the future and there's a lot of unpredictability.

However, previous studies mostly looked at how easy it is to buy and sell stocks altogether. Some examples of these studies includes the ones done by Nguyen, Umar, Kunjal, Tiwari, and Gofran. The literature is missing research on how the stock market is affected during tough financial times. There is a big opportunity to change your loans and money stuff because there isn't enough money around. This means that it will be very difficult to get new loans if there is less money available in the future. This study helps create important government plans for the economy and adds to existing knowledge about how easy it is to trade things in markets.

LITERATURE REVIEW

In previous studies, different definitions of how easily stocks can be bought and sold in the stock market were found (Nguyen et al. , 2021; Umar et al. , 2021; Kunjal, 2021). In simple words, trading quickly without affecting the price much is an important everyday aspect. The ease of buying and selling things in the stock market is called liquidity. It's connected to how much you can buy or sell, how quickly you can do it, and how wide the selection is. But, the most common things people talk about when it comes to market liquidity are how many buyers and sellers there are and how well the market can handle changes. Market depth and resilience mean that there are a lot of people buying and selling without causing the prices to change much. People in the market think that the prices of things won't change a lot. In simpler terms, how strong and able the market is depends on how much prices are affected and how much trading is happening. The ease of trading stocks is different for each type of stock market. This difference happens because of how the market is set up and what kind of market it is. Order driven means a market where the prices of goods are determined by the orders that customers place.

These are markets where you don't know who you are trading with. The prices and amounts of trades are shown on a website where people can buy and sell things. These markets are transparent, which means everything is clear and easy to understand. Everyone in the market can easily get the order books, and the exchange helps traders by matching their standard buying and selling needs. This makes it easier for people to buy and sell things. Stocks, contracts for buying or selling things in the future, and agreements to buy or sell with short-term interest rates are bought and sold on markets where purchases are made based on orders. On the other hand, quote-driven markets work by using quotes provided by market makers to make trades. People who help buy and sell things in certain markets risk losing or gaining a lot of money if prices go up or down. To lower the chance of something bad happening, brokers are encouraged to take part in the market to make it easier to buy and sell things. The price given by the

person who helps sell things can change a lot in this kind of market. It only lasts for a certain time.

Stock market liquidity depends on four main things: the stability of the world's money system, rules in place for financial markets, the size of the market and how well the banks are doing. When something is hard to sell, there is usually a big difference between the price buyers want to pay and the price sellers want to receive. Before, in Hong Kong in 1987, there was a problem with having enough money to trade in the market. This caused the market to stop working for 4 days. Tables 1 and 2 show what other people have found out about how easy it is to sell stocks when the economy is in trouble.

The tables show that during both the financial crisis in 2007-2008 and the Covid-19 pandemic, there was not enough money available in financial markets. The studies show that during a money problem, markets may not always have enough money available, but this isn't always true. The writer of this paper wants to help explain something about the stock market that other people haven't explained clearly yet. Specifically, they want to talk about how easily people can buy and sell stocks.

METHODOLOGY

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Table 1. Liquidity in the Stock Market During the 2008–2009 Financial Crisis

Study	Model	Period	Country	Findings
Danget al. (2014)	Regression analysis	January 2003-December 2007	17,493 stocks across 41 countries	The financial crisis had a negative impact on market liquidity

Table 2. Stock Market Liquidity During the Covid-19 Pandemic

Study	Model	Period	Country	Findings
Nguyen et al. (2021)	Panel data regression	January 30 th , 2020-May 15 th , 2021	Vietnam	Negative relationship between the Covid-19 pandemic and market liquidity
Umar et al. (2021)	GARCH model	December 31, 2019- 10, July 2020	China	Significant liquidity decline in the Chinese stock market during the Covid-19 pandemic
Kunjai (2021)	T-statistics	March 5, 2020-June 12, 2020	South Africa	The market liquidity of specific firms listed in the Johannesburg stock exchange decreased significantly during the Covid-19 pandemic
Tiwari et al. (2022)	Wavelet coherence	December 2019-July 2020	China, Australia and G7 nations	Countries that were affected by the Covid-19 pandemic experienced lower liquidity
Gofran et al. (2022)	Multivariate regression analysis	January 2020-May 2020	China, Germany, Spain, US and UK	The pandemic caused short term liquidity problems but it will not be significant in the long run

Source: Author

Table 3. Stock Market Liquidity During the Financial Crisis for the CAC 40 & DAX

Variable	Coefficient	CAC 40	Z-statistics	P-value	Coefficient	DAX	Z-statistics	P-value
		Standard error				Standard error		
		Regime 1				Regime 1		
C	6246.026	55.33	112.88	0.000*	16164.5	106.63	151.5	0.000*
Volume	0.0000183	0.0000622	0.29	0.7687	-0.000065	0.0000139	-4.71	0.000*
Sigma	558	0.0559	99.87	0.000*	568	0.08	70.8	0.000*
		Regime 2				Regime 2		
C	7137.94	39.36	181.32	0.000*	13238.94	147.40	89.8	0.000*
Volume	-0.000018	0.000047	-3.94	0.0001*	0.000032	0.0000167	1.9	0.055
Sigma	5.02	0.0753	66.64	0.000*	656	0.0552	118.7	0.000*
		Transition matrix parameters				Transition matrix parameters		
ρ_{11}	5.64	1.18	4.75	0.000*	5.322259	1.33	3.99	0.0001*
ρ_{21}	-5.32	1.32	-4.01	0.0001*	-5.670551	1.18	-4.78	0.000*

Table 4. Stock Market Liquidity During the Financial Crisis for JSE & Nasdaq

Variable	Coefficient	NIKKEI-225	Z-statistics	P-value
		Standard error		
		Regime 1		
C	28977.8	277.0191	104.60	0.000*
Volume	-0.793	382	-2.07	0.3892
Sigma	6.47	0.0684	94.65	0.000*
		Regime 2		
C	27969.99	317.79	88.01	0.000*
Volume	-0.00017	0.00039	-4.26	0.000*
Sigma	6.30	0.0712	88.53	0.000*
Transition Matrix Parameters				
ρ_{11}	3.44	0.54	6.36	0.000*
ρ_{21}	-3.47	0.538	-6.46	0.000*

*significant at 5%

Table 5. Stock Market Liquidity During the Financial Crisis for Nikkei-225

Variable	Coefficient	JSE	Z-statistics	P-value	Coefficient	Nasdaq	Z-statistics	P-value
		Standard error				Standard error		
		Regime 1				Regime 1		
C	10454.24	39.32	265.84	0.000*	2577.17	47.26	54.52	0.0000*
Volume	0.00163	0.00190	0.86	0.3892	-0.000091	0.0000002	-4.29	0.0000*
Sigma	5.5	0.0753	73.38	0.000*	4.86	0.0509	95.45	0.0000*
		Regime 2				Regime 2		
C	11262.95	49.63	226.90	0.000*	1443.274	50.79	28.41	0.000*
Volume	0.000171	0.00015	1.10	0.2705	0.0000007	0.0000220	3.22	0.0013*
Sigma	5.78	0.00677	85.31	0.000*	4.94	0.0538	91.78	0.000*
Transition Matrix Parameters					Transition Matrix Parameters			
ρ_{11}	3.47	0.53	6.50	0.000*	6.01	1.22	4.88	0.000*
ρ_{21}	-3.3	0.48	-6.92	0.000*	-5.95	1.25	-4.73	0.000*

*significant at 5%

This is a theory called GARCH that was created by Engle and Russell in 1998. This method of measuring how easily assets can be turned into cash was good because it looks at how past and current events affect the value of those assets. In this study, they calculated how much cash was available by looking at how often people traded (called "trading volumes") and how the numbers varied (called "variance"). Then they looked at how the changes in cash affected the prices. The Markov GARCH model was created by Haas in 2004.

"Let's simplify this text. S equals k if certain conditions are met. H is the amount of variation and the letter ε represents something else. "

the things that are used to share or divide something among different parts or people. The Markov switching GARCH model uses certain parameters to show how dependent and independent variables are connected.

Table 6. Stock Market Liquidity During the Pandemic for the CAC 40 & DAX

Variable	Coefficient	CAC 40	Z-statistics	P-value	Coefficient	DAX	Z-statistics	P-value
		Standard error				Standard error		
		Regime 1				Regime 1		
C	5311.36	46.25	114.8	0.000*	15920.75	63.19137	251.945	0.000*
Volume	-0.0000356	0.000042	-8.4	0.000*	-0.000618	0.0000094	-6.540587	0.000*
Sigma	5.95	0.0509	116.80	0.000*	0.000570	0.052	109.3836	0.000*
		Regime 2				Regime 2		
C	6668.82	61.40	108.59	0.000*	14228.31	120.74	117.8	0.000*
Volume	-0.000031	0.0000079	-3.92	0.0001*	-0.000167	0.0000111	-14.9	0.000*
Sigma	5.96	0.047	125.9	0.0000*	6.88	0.0412	167.04	0.000*
		Transition matrix parameters				Transition matrix parameters		
ρ_{11}	5.21	0.83	6.27	0.000*	6.083287	1.289994	4.71	0.000*
ρ_{21}	-5.97	1.08	-5.5	0.000*	-6.304316	1.203804	-5.23	0.000*
*significant at 5%								

Table 7. Stock Market Liquidity During the Pandemic for JSE & Nasdaq

Variable	Coefficient	JSE	Z-statistics	P-value	Coefficient	Nasdaq	Z-statistics	P-value
		Standard error				Standard error		
		Regime 1				Regime 1		
C	10399.68	49.71	209.20	0.000*	7565.3	262.90	28.77	0.000*
Volume	-0.000802	0.000163	-4.90	0.000*	0.0000718	0.00000551	13.01	0.000*
Sigma	6.02	0.0523	115.04	0.000*	7.29	0.00404	180.62	0.000*
		Regime 2				Regime 2		
C	11224.53	37.2	301.41	0.000*	13815.77	338.2305	40.84	0.000*
Volume	-0.00024	0.000104	-2.35	0.019*	0.0000192	0.0000734	2.61	0.009*
Sigma	5.81	0.044	130.89	0.000*	6.58	0.00527	124.9	0.000*
		Transition Matrix Parameters				Transition Matrix Parameters		
ρ_{11}	3.6	0.48	7.44	0.000*	6.35	1.20	5.25	0.000*
ρ_{21}	-3.9	0.46	-8.50	0.000*	-6.14	1.32	-4.62	0.000*

Table 8. Stock Market Liquidity During the Pandemic for Nikkei-225

Variable	Coefficient	NIKKEI-225	Z-statistics	P-value
		Standarderror		
		Regime 1		
C	28365.94	214.53	132.21	0.000*
Volume	0.00066	0.0000303	2.20	0.0275*
Sigma	6.68	0.00461	145.11	0.000*
		Regime 2		
C	25917.2	341.09	75.98	0.000*
Volume	-0.00041	0.0000401	-0.103	0.000*
Sigma	7.54	0.0000463	162.93	0.000*
Transition Matrix Parameters				
ρ_{11}	6.19	1.23	5.02	0.000*
ρ_{21}	-6.17	1.23	-4.98	0.000*
*Significant at 5%				

If the p-values in one or more circumstances are not important, then the markets being looked at will be considered liquid. The opposite also applies. Here are the results of the Markov switching GARCH model.

RESULTS AND DISCUSSION

The Regime Parameters are Given by;

$$h_{t+1} \equiv \omega + \alpha y_t^2 + \beta h_{t-1}$$

$$h_{k,t} \equiv \omega_k + \alpha_k y_{t-1}^2 + \beta_k h_{k,t-1}$$

Haas wrote this in 2004. The financial markets we looked at were places where people buy and sell stocks. They included the French stock market, the Frankfurt Stock Exchange, the Johannesburg stock exchange, Nasdaq, and the Nikkei stock average. This study is looking at two time periods: the financial crisis from December 1, 2007 to June 30, 2009, and Covid-19.

A widespread outbreak of illness called a pandemic happened from January 1, 2020 to December 31, 2021. The money situation.

The results of the Markov model are shown in Tables 3–8.

- Stock Market Liquidity During the Financial Crises

Choose between two different systems: regime 1 or regime 2. The Nasdaq index was showing signs that it was hard to sell because there was a big difference between the price and the amount of trading happening. This means that the results match with what the BCBS said in 2013. The BCBS said that certain banks and financial companies were involved.

This means that even after the big problem with the world's money in 2007-2008, there are still clear signs that there is a lot of money available. This research found that some places where people buy and sell things for money had lots of money available, which backs up a previous study from 2013.

How easy it is to get money during the Covid-19 outbreak. The tables show the results of the Markov analysis.

A switch is a tool used to change something from one state to another. countries experienced a decrease in their economic growth and some businesses had to close down due to financial difficulties.

The markets were still showing signs that there was a lot of money available. This can be seen in a few stock index markets like CAC, DAX, Nikkei-225 and JSE where the price and amount of trading didn't affect each other much (not very important). The Nasdaq index was hard to trade because there weren't enough buyers and sellers. This happened because the price didn't match the trading volume well. This study agrees with the Basel Committee on Banking Supervision (BCBS) from 2013, which said that even after the big financial crisis in 2007-2008, some banks and financial organizations were still doing well with their money. This research shows that some financial markets had lots of money available, which is similar to what was found in a previous study by BCBS in 2013. Regarding the market being easy to buy and sell during the covid-19 pandemic in Tables 6-8, the results show something different. The markets we studied were not easy to sell things in. This can be seen in the connection between the price and how much is being traded (the price is less than 5% of the trading volume). Simply put, the prices of these financial markets are easily influenced by the amount of trading that happens each day. This means that the markets don't have a lot of depth to them. So, we can see that availability of money during financial problems has changed. This could be because the rules for how much money people need to trade on the market have gone up a lot in the last decade. The difference between buyers and sellers in the market has increased a lot, which could be causing less trade to happen. When times are tough financially, the amount of money you need to borrow and the difference in knowledge between people can become more extreme. This can cause there to be less money available during crises like the 2007-2008 global crisis or the Covid-19 pandemic.

We wanted to find out how easy it is to buy and sell things in the market when things are not going well financially. This means the problems with money that happened in 2007-2008 and the virus outbreak called Covid-19 that is happening now. This study used a tool called the Markov switching model to analyze data. This tool is helpful because it can account for major changes in the data over time. This study showed that during the financial crisis in 2007-2008, some markets had enough money to keep things going smoothly. The financial markets talked about in this study were hard to buy and sell things in. The results show that financial markets are slowly losing their ability to quickly buy and sell things, especially when there are financial problems. Berner (2015) said that there is less money around when the economy is in trouble. Furse (2015) says that the evidence shows the market is getting worse and worse. It is really important for the bosses in charge of rules to check and change some of the trading rules when there are money problems. This means that in some places, exchanges can stop the prices from going too high or too low. Curbing practice means controlling the prices by using circuit breakers. This is done when the prices rise too high or fall too low. Different stocks have different limits on how much they can be traded. If a company has a lower limit, it might not be able to handle a lot of trading. Trying to keep prices low in tough financial times can lead to big problems. This

could be one reason why there's not enough money around during the covid- 19 crisis.

RESULTS

Problems or emergencies that happen suddenly and can cause danger or difficulty are called crises. The tables show the results of the Markov switching model. During the time when the whole world was having money problems, some places still had a lot of money available. This can be seen in the CAC, DAX, Nikkei-225, and JSE where there was no important link between the index price and volume (p-values greater than 5%) in any of these.

FURTHER STUDY

This research still has limitations, so it is necessary to carry out further research related to the topic Evidence from International Financial Markets on Stock Market Liquidity During Times of Distress and Its Consequence. In order to perfect this research, it will add insight for researchers

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