Impact of financial contagion on developed and emerging economies in the wake of the covid-19 pandemic and the Russia-Ukraine conflict

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ABSTRACT

The world economy has been experiencing two double difficulties, including the COVID-19 pandemic and the war of Russia and Ukraine. The Russia-Ukraine war, accompanied by strong Western economic sanctions as well as Russia's reactions, has had a comprehensive and profound negative impact on the world economy. With the openness of the economy as high as it is today, the influence between different economies is understandable. The research results focus on analyzing the financial contagion between mature and emerging markets in the post-COVID pandemic and the war of Russia and Ukraine. The study collected random stock index data from 5 developed and 5 developing countries from 2015 to the end of January 2023. The study uses the GARCH(1,1)-M model to find the financial spread between selected countries. Research results show that developed countries have a larger financial spread than developing countries, especially during the post-COVID pandemic and the war of Russia - Ukraine period.

Keywords: Financial Contagion, Volatility Spillover, COVID-19 pandemic, War, Western economic.

1.   Introduction

The globalization of both the economy and the financial sector has resulted in a significant correlation between stock markets, especially in the face of large external shocks. Financial crises and pandemics like COVID-19 are examples of global unrest that might cause these shocks, which in turn speed up the spread of hazards across various markets (Duong et al., 2023). It is crucial to distinguish between cross-market independence and contagion effect when evaluating the phenomena of contagion across stock markets. Splitting a chaotic chronology into a stable era and a crisis-era allows us to examine the connections between events better. It's possible to find a reasonable relationship between two stock markets in a steady setting. This weak link, however, might dramatically increase when the same two markets are subjected to a climate of disturbance (Jebri, Jilani, & Liouane, 2013). The term "pairwise correlation" is often used to describe the evaluation of cross-market correla

tions both before and after a crisis occurrence. Before and during a crisis, a significant increase in pairwise correlations between stock markets is indicative of contagion. The lack of a noticeable rise in paired cross-market correlations during a crisis is indicative of interdependence. According to the research of Duong et al. (2023), the term "contagion" refers to a situation in which the links across markets are significantly altered after a big external shock to one stock market, while "cross-market independence" indicates that there have been no such changes. The scope of the financial instability caused by the spread of the COVID-19 pandemic from China to Europe and then to the United States was revealed in a research by Ali et al. (2020). The global financial system is highly interdependent and vulnerable to shocks, as seen by the enormous volatility seen in financial markets throughout the globe. In addition, the conflict between Russia and Ukraine had a major impact on the economics and bud-

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gets of several nations. The conflict's geopolitical tensions sent shockwaves across the financial markets, adding uncertainty to an already unstable global economy. The interconnected nature of stock markets has increased their vulnerability to exogenous shocks like financial crises and pandemics as a result of globalization. When evaluating the dynamics of these interdependencies, the difference between cross-market independence and contagion effect is key. The fragility of financial markets has been shown by global crises like the COVID-19 pandemic and geopolitical conflicts like the Ukraine-Russia war, both of which have caused huge economic disruptions. Policymakers, investors, and market players must understand the processes and effects of contagion in order to successfully manage the increasingly linked and turbulent global financial environment.

2. Literature Review
2.1. Mechanism of Crises

An economy's production might vary up and down or even cycle during "normal" periods. Yet the abrupt damage that causes 'suffering' among homes or businesses is what qualifies as a crisis. In other terms, a crisis is a sudden event that causes businesses to fail and families to lose their employment. In contrast to normal times, crises fluctuate dramatically and increase unemployment rates as a result of unexpected bankruptcies. It is not appropriate to refer to the situation as a "crisis" absent significantly rising unemployment rates or bankruptcies. If it happens over the medium or long term, the entire economy is able to adjust to the new circumstances, preventing bankruptcies and significant unemployment rates from occurring. Insanity, panic, and collapse are the three stages that Kindleberger categorizes catastrophes under. Every crisis go through these stages. In the era of insanity, prices rose unreasonably for specific items or industries, and consumers increased demand; in the period of panic, it is recognized that prices are not logical and that quick sales are about to occur. In fact, the insane behavior that occurred when prices "crashed swiftly" coincided with the collapse (Kindleberger & Aliber, 2005). In a global economy, the absence of efficient resource allocation slows down economic development and recovery takes a long time because it impacts the

entire system. As a result, economic crises make capitalism a chaotic system. First off, as Kindelbergen argued in 2005, price bubbles brought on by speculative or misinformed behavior constitute the manias phase of crises. Another kind of asymmetric information is speculation. Speculative bubbles deviate from the intrinsic value of some assets (Xiao, 2010). When there is speculation, the pricing system, which relies on fully and accurately informed economic agents, does not function as it should and, as a result, misleads supply and demand. It is anticipated that there would be an increase in insolvent debt stocks during this period due to rising prices and profitable investing possibilities. This results in the wasteful use of resources, the expansion of bubbles, and an increase in debt. Last but not least, the economy collapses quickly as a result of unsustainable demand and debt, resulting in bankruptcies and a sharp rise in unemployment. An economic crisis is this brief period and adaptation to "new," well-informed conditions. In other words, economic crises mark the onset of symmetric information. The internal dynamics of the economy and regulations and interventions are the two fundamental components of economic growth and contraction cycles (Anwar, 2018). The ratio, amount, or absence of these two will significantly affect the result. The goal of all orthodox economic theories and systems is to improve human welfare since doing so makes resource allocation more efficient. Allocative efficiency ensures that these resources are distributed effectively. Resources may not be allocated properly in particular situations or systems, according to criticisms. These accusations are based on current economic difficulties. Marx highlighted that capitalism occasionally causes crises and that these crises appear to be systemic. Crises and issues appear in many forms, and with each crisis, new theoretical stances are produced, just as economic theory generates new prescriptions. Although the nature and scope of the crises vary, they consistently worsen the way resources are allocated, eventually leading to unemployment. A crisis is typically an unanticipated, undesirable, and harmful circumstance that is managed or has to be managed. Despite a well-managed crisis, the current optimization research is far from the old optimum without crises. A break must thus always be mentioned in an ad-

aptation. Bankruptcies are another sign that the system is failing. The system's flaws or shortfalls are what cause the breakdowns, namely the crises. These flaws lead to disaster. What impact do these destructions have on the entire economy then? In other words, it's apparent that a crisis is causing unemployment and depression. A catastrophe in an economy where everyone is employed and earning a living wage is unthinkable.

2.2. Financial contagion

The spread of financial crises may occur on a global as well as a national scale. Failure of a domestic financial institution may have a ripple effect across the domestic financial system when it defaults on interbank commitments and conducts a fire sale to liquidate its assets (Dungey & Tambakis, 2010).. The subsequent turmoil in US financial markets is an example of this phenomenon in action. International financial contagion refers to the spread of financial crises across financial markets and, by extension, economies in both developed and developing countries. Due to the huge volume of capital movement enabled by mechanisms like hedge funds and the cross-regional activities of giant banks. Financial contagion is difficult to attribute to observable factors in the economy, such as the amount of bilateral trade (Jebri, Jilani, & Liouane, 2013).One of the main characteristics of the global financial crisis was strong financial contagion, as localized issues in certain financial market segments quickly transformed into a crisis of global proportions. Countries are far more likely to experience a financial crisis during times when there is a big financial contagion shock than during times when there is not. A country's yearly crisis probability increases to more than 28% during these times (Ahrend and Goujard, 2011). By cleverly integrating data on banks' international lending and country credit ratings, it is possible to estimate the significance of contagion shocks. A recent global financial crisis was not the first to be caused by bank-driven financial contagion, according to new OECD study.

2.3. Impact of Covid-19 on the world economy
The first phase of the pandemic (from January 1, 2020 to December 31, 2021)
The emergence of the COVID-19 pandemic coin-

cided with a robust globalisation movement, which facilitated its fast spread and made containment difficult. The worldwide economic impact of the pandemic has been substantial. Estimates forecast the global GDP at about US$84.54 trillion in 2020, which would be a decrease of 4.5% from 2015 and a loss of production of almost $2.96 trillion. In 2021, global economic growth slowed significantly, although it was still relatively modest (Duong et al., 2023). Damage to the global economy from the COVID-19 pandemic may be traced back in large part to the widespread interruptions in production and demand that the epidemic has caused. The severely affected sectors are a glaring example of this, especially the tourism and travel sectors. Due to travel restrictions put in place by various countries to prevent the spread of the disease, many people are unable to book tickets for vacations or business travels. As a result of a drop in passenger volume, airlines are finding that they need to cut down on the number of flights they provide just to break even. In light of the significant difficulties confronting the global economy and the predicted negative growth of 4.5% in 2020, a number of country governments have created effective methods to mitigate the impact on their national economies (Rathnayake et al., 2022). Major tools include direct financial aid to the population, changes in fiscal and monetary policy, changes in government spending, etc. Moreover, despite the ubiquitous and broad difficulties, several sectors continue to benefit from the COVID-19 pandemic. These sectors include e-commerce, food retail, information technology, and the care sectors. In addition to offsetting part of the loss, the better health of these businesses also contributes to economic development.

Later phase of the COVID-19 pandemic (starting January 1, 2022)
If the story of limited supply, reduced demand, and firms delaying investment originated in the early stages of the COVID-19 epidemic, then it has continued from the beginning of 2022 to the current day. Thanks to the widespread use of the vaccine, people all across the globe have recovered from the worst of the Covid-19 outbreak. At this stage, the market's supply-demand dynamic transforms in a more favourable fashion (Duong et al, 2023).

2.4. Impact of Russia – Ukraine conflict

Throughout the three decades since the fall of the Soviet Union, the war between Russia and Ukraine has had a significant impact on global politics and radically altered the European security system. The US, Europe, and some other nations have imposed a number of sanctions against Russia at the same time that are among the worst ever. The global financial, oil, and gas markets were greatly disrupted by these events, which also led to higher inflation and slower global economic development (Reuters, 2023). Ukraine's economy has been decimated by the war, resulting in a 30% decline in GDP (Reuters, 2023). The world's financial and commercial markets as well as those in Russia were immediately impacted by the war and the blockade. The ruble sharply declined against the US dollar, the Russian stock market was forced to close for many days in a row, the Central Bank of Russia increased its prime interest rate to 20%, and this year, Russia's GDP is expected to contract by 7% (or more) and in-flation to exceed 20%. The National Institute of Economic and Social Research (NIESR) in the UK predicts that this war will lower global GDP by at least 1% this year and raise inflation by 3%.

3. Methodology
4.1. Data collection

In this particular piece of research, the survey is carried out by collecting weekly data from 10 countries, of which 5 are developed and 5 are developing. Countries are selected base on the size of their economies, from largest to smallest and various financial metrics for each country. For instance, the three most essential indexes in the United States are Dow Jones, Nasdaq, and S&P 500; they are similar in other nations. We choose the primary indices in which large businesses operate in the nation's economy under observation. Large businesses are those with high revenues and lead the economy. They also significantly impact how healthy the economy is in the nation being studied. The list of selected countries is as follows:

NO	Countries	Acronym of country	Index	Acronym of index
1	United States	US	S&P 500	SP
2	Canada	CA	TSX Composite	TSX
3	United Kingdom	UK	FTSE 100	FTSE
4	Germany	GE	DAX 40	DAX
5	Switzerland	SW	Swiss Market Index	SMI
6	Brazil	BR	Bovespa Brazil 50	IBX50
7	Malaysia	MA	FTSE Malaysia KLCI	KLSE
8	Thailand	TH	Bangkok SET50 Index	Bangkok
9	Greece	GR	The Athens Stock Exchange General Index	Athens
10	Egypt	EG	EGX 30	EGX

Table 1:
List of chosen countries

The author gathers information for research from market indexes that reflect those nations. It is challenging to evaluate and interpret data since different indicators are used by different marketplaces. Because of this, the author has changed to weekly returns to make it easier to analyze and contrast data from other markets. The return of each market index is calculated using the log return. Using weekly data provides more accurate information on spreads. Therefore, weekly data collection will help us to observe the dependency level more objectively and accurately. The author gathered data from 2015 to the end of January 2023 in an effort to lessen the effects of the global financial crisis that occurred between 2007 and 2008. The SARS-CoV-2 virus and its variants are responsible for the global spread of sickness known as the COVID-19 pandemic. started in late December 2019 when a number of people in Wuhan, China, came down with a mysterious strain of pneumonia (Ali, Alam, & Rizvi, 2020). On the same day in 2022, Russia launched a full-scale invasion of Ukraine. Following a concentration of forces, Russia officially recognized Donetsk and Lugansk as separate entities, and Russian Military Forces moved into the Donbas region of eastern Ukraine (Balbaa, 2022).

4.2. Model

For assets with clustered periods of return volatility, GARCH is a helpful tool for evaluating risk and future returns. When the variance of the error component varies over time, GARCH models are used. The volatility (risk) of a securities may have an effect on its return in the financial markets. To mimic these occurrences, the GARCH-in-mean (GARCH-M) model adds a heteroskedasticity term to the mean equation. It's adequate for the purpose. The GARCH-M(p,q) model is written as

$$x_t = \mu + \lambda \sigma_t + \alpha_t$$

$$\sigma_t^2 = \alpha_o + \sum_{i=1}^{p} \alpha_i \, \alpha_{t-i}^2 + \sum_{j=1}^{q} \beta_j \, \sigma_{t-j}^2$$

$$\alpha_t = \sigma_t \times \epsilon_t$$

$$\epsilon_t \sim P_v(0,1)$$

Where:
Value of the time series at time t (represented by x_t) GARCH model mean (represented by) GARCH model volatility coefficient (represented by) The model residual at time t is denoted by _t. The volatility, denoted by the symbol _t, is the conditional standard deviation. Standardised residuals [t] at time t, where p is the order of the ARCH component model, [t] is the time, [t] are the parameters of the ARCH component model, [t] are the parameters of the GARCH component model, and [t] are the parameters of the GARCH component model. Therefore, in this study, the author uses the GARCH(1,1) - M model to find out the effect of the return of one country on another country. To confirm whether the financial contagion from one country to another is statistically significant, the author uses a statistical significance level of 5%.

5.   Findings and Discussion
4.1. Descriptive statistic

Statistics used to summarise or describe numerical or graphic representations of data sets or study samples. The mean and the standard deviation are the two most used descriptive statistics. The following are some descriptive statistics for return indices:

The table above shows descriptive statistics about weekly return of indexes in the period from 2015 to 2023. In which, the 3 indexes with the highest weekly return include: Bovespa Brazil 50 of Brazil (Average value is 0.002458), S&P 500 for the United States (Mean value is 0.001956), and EGX 30 for Egypt (Mean value is 0.001818). There are also variations between countries based on the difference in standard deviation. The three countries with the highest level of risk are Greece's ATHENS (average standard deviation 0.0399) Brazil's IBX50 (average standard deviation 0.0334) and Egypt's EGX30 (average standard deviation). deviation is 0.03309). The author used the Jarque-Bera test to verify the data distribution of each observed item before to running the regression model. We see that most observations do not follow a normal distribution. It is clear that the majority of indices have negative offsets and are not zero. Due to the fact that the vast majority of values have negative skewed values, these distributions are left skewed. Canada, as shown above, is ranked last

	AT HENS	BANG KOK	DAX	FTS E	EGX	IBX5 0	KLS E	SMI	SP	TSX
Mean	0.000987	0.000247	0.001503	0.000694	0.001818	0.002458	-0.000267	0.000798	0.001956	0.001026
Median	0.003543	-0.000605	0.003237	0.001933	0.001817	0.003579	-0.000766	0.002437	0.003107	0.002006
Maximum	0.160316	0.096924	0.109069	0.078877	0.213115	0.174068	0.056392	0.076709	0.121017	0.094938
Minimum	-0.201834	-0.180711	-0.200123	-0.169661	-0.177641	-0.193913	-0.093284	-0.140627	-0.149796	-0.152005
Std. Dev.	0.039990	0.021700	0.028394	0.022085	0.033091	0.033403	0.015303	0.021829	0.024412	0.020556
Skewness	-0.839334	-1.001276	-0.997172	-1.199634	0.009909	-0.339312	-0.048910	-1.622132	-0.640775	-1.747864
Kurtosis	8.089211	16.582570	10.490070	13.043860	10.378890	7.986271	6.960475	11.681570	9.509817	15.903900
Jarque-Bera	504.958	3,314.395	1,056.381	1,875.010	957.385	445.270	275.969	1,510.318	774.020	3,142.684
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sum	0.416	0.104	0.634	0.293	0.767	1.037	-0.113	0.337	0.825	0.433
Sum Sq. Dev.	0.673	0.198	0.339	0.205	0.461	0.470	0.099	0.201	0.251	0.178
Observations	422	422	422	422	422	422	422	422	422	422

Table 2:
Descriptive statistic of stock index return

since it has the lowest skewness value, -1.747864. In general, the data set's dispersion is not very great because no observation has a pronounced maximum or lowest value. The picture above shows the weekly returns for each index for the time period beginning in January 2015 and ending in January 2023. The charts in the aforementioned Figure provide an overview of the performance. When the market indexes of 10 different nations are combined, volatility results. Also, all charts exhibit volatility clustering, as seen in the graphic above, which illustrates how volatility in the most recent period will affect volatility in succeeding periods. It is obvious that all market indexes exhibit high levels of volatility at times of crisis, particularly during the most recent COVID-19 epidemic.

4.2 Research results
4.2.1. Effect of Financial contagion between mature and emering market in period 2015 – 2023.

The above table shows the influence of countries on finance for the entire period 2015 - 2023. The results of the study indicate that there is financial contagion between countries. Developed and developing countries interact with each other in terms of stock indexes. Canada is the country with the largest financial contagion. In which, there are 5 countries that have a statistically significant influence on Canada's stock return, including: United States (Regression coefficient is 0.445), United Kingdom (Regression coefficient is 0.178), Brazil (Regression coefficient is 0.047), Malaysia (Regression
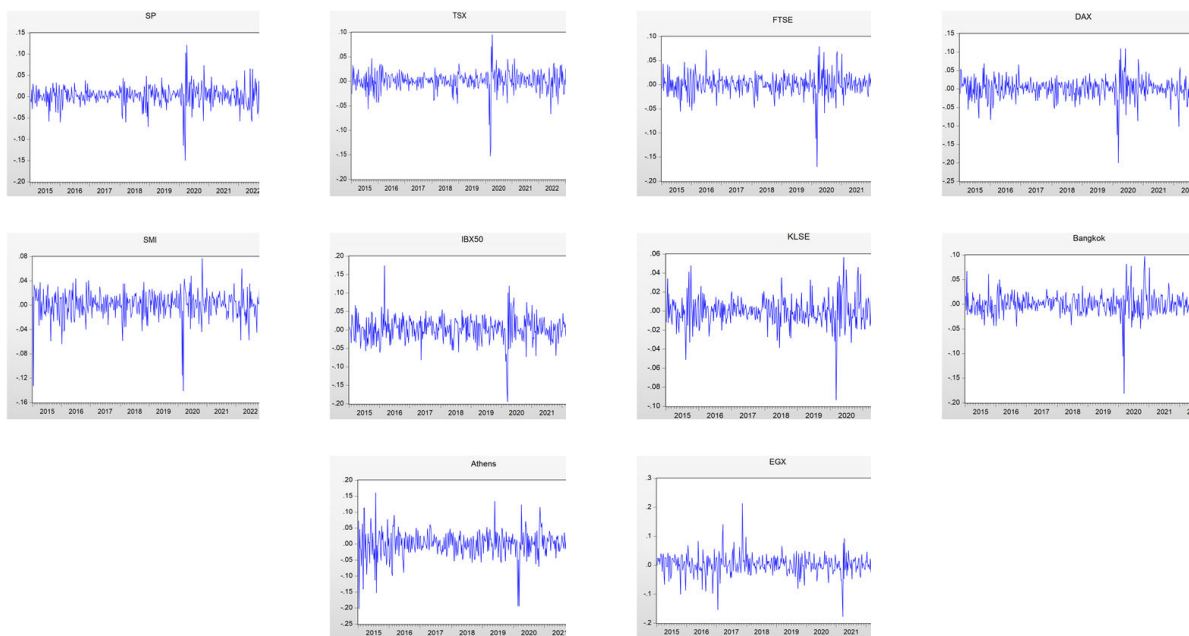
Figure 1:
The weekly returns of all the indexes

coefficient is 0.089) and Thailand (Regression coefficient is 0.107). All regression coefficients are positive, showing a positive im- pact of the above markets on Canadian stock return. Canada affects 4 coun- tries including: United States (Regression.

	TSX	SP	DAX	FTSE	SMI	IBX50	KLSE	Bangkok	Athens	EGX
TSX		0.607*	0.054	0.231*	-0.052	0.475	0.126*	0.239*	-0.115	-0.163
SP	0.445*		0.201	-0.022	0.186	0.239	-0.030	-0.074	-0.032	0.007
DAX	0.029	0.118*		0.292*	0.260	-0.015	0.038	0.135*	0.280*	0.039
FTSE	0.178*	-0.005	0.519		0.325	0.323	0.001	0.109	0.284*	0.049
SMI	-0.005	0.197*	0.338	0.246*		-0.337	-0.016	-0.082	0.239*	0.156
IBX50	0.047*	0.048*	-0.005	0.056*	-0.086		0.088*	0.048	0.090	0.027
KLSE	0.089*	-0.013	0.041	-0.013	0.005	0.452		0.397*	0.025	0.015
Bangkok	0.107*	-0.015	0.111	0.091*	-0.014	-0.001	0.267*		0.416*	0.035
Athens	0.001	0.000	0.012	0.024	0.107	0.108	0.006	0.077*		-0.094*
EGX	-0.012	0.005	-0.003	0.021	0.021	0.021	0.006	0.036	-0.072	

Notes: Figures in parentheses indicate the value of t-statistics.* denote significance at the 5% level.

Table 3:
Effect of financial contagion between mature and emerging markets in period 2015 - 2023
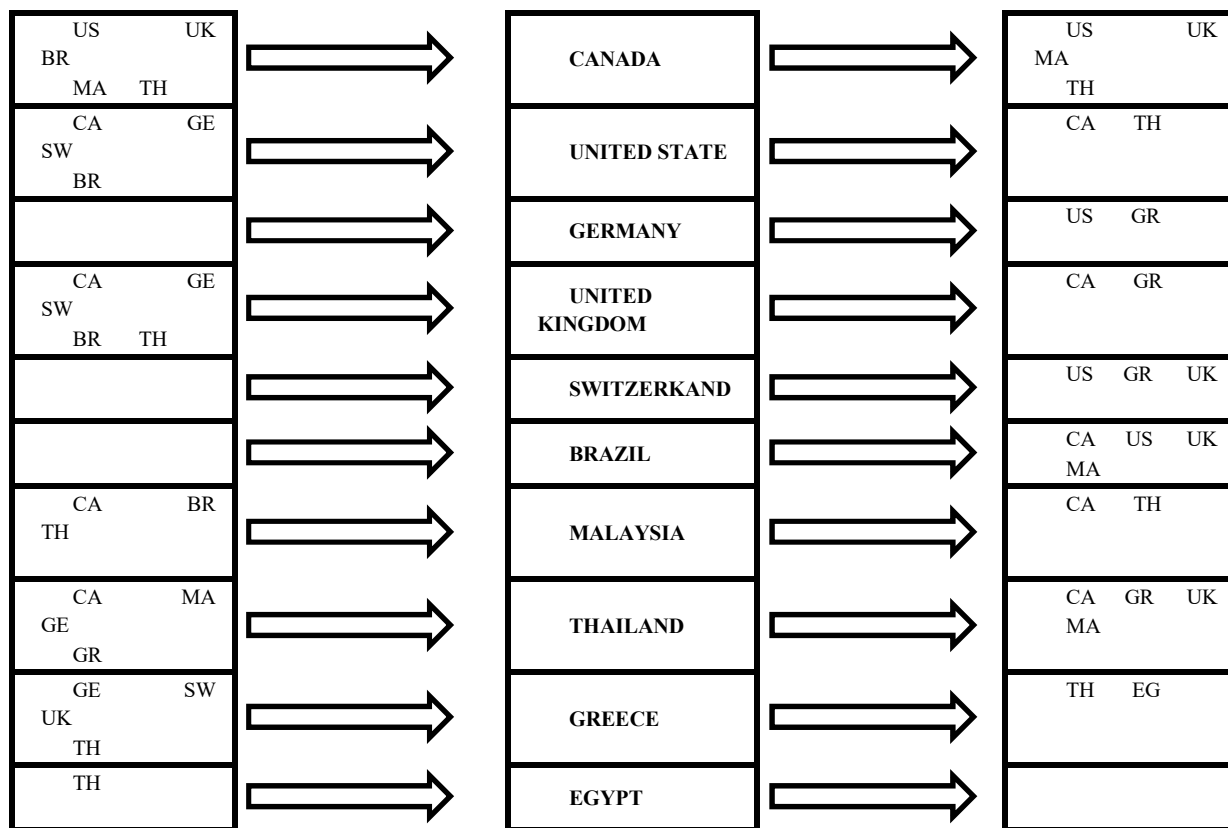
US UK BR MA TH	⇒	CANADA	⇒	US UK MA TH
CA GE SW BR	⇒	UNITED STATE	⇒	CA TH
	⇒	GERMANY	⇒	US GR
CA GE SW BR TH	⇒	UNITED KINGDOM	⇒	CA GR
	⇒	SWITZERKAND	⇒	US GR UK
	⇒	BRAZIL	⇒	CA US UK MA
CA BR TH	⇒	MALAYSIA	⇒	CA TH
CA MA GE GR	⇒	THAILAND	⇒	CA GR UK MA
GE SW UK TH	⇒	GREECE	⇒	TH EG
TH	⇒	EGYPT	⇒	

Figure 2:
Impacts between countries during the entire period

	TSX	SP	DAX	FTSE	SMI	IBX50	KLSE	Bangkok	Athens	EGX
TSX		0.934	-0.048	0.294*	0.005	0.358	0.065	0.304	-0.103	0.056
SP	0.461*		0.246	-0.108	-0.027	0.328*	-0.086	-0.256*	-0.019	-0.100
DAX	-0.062	0.263		0.281*	0.531*	0.348*	0.037	0.077	0.377	0.036
FTSE	0.225*	-0.162	0.347		0.211*	0.370*	-0.153	0.165	0.246	-0.038
SMI	0.077	-0.011	0.487	0.204*		-0.586*	0.138	0.018	0.017	0.112
IBX50	-0.014	0.105	0.112	0.161*	-0.180*		0.232*	-0.139*	0.059	0.095
KLSE	0.036	-0.068	0.004	-0.117	0.112	0.477*		0.517*	-0.156	-0.107
Bangkok	0.193*	-0.177	0.031	0.022	0.021	-0.177	0.364*		0.606	-0.141
Athens	-0.030	0.002	0.124	0.099*	-0.019	0.048	-0.098	0.414*		0.086
EGX	0.051*	-0.405	0.010	-0.011	0.012	0.035	-0.085*	0.027	-0.013	

Notes: Figures in parentheses indicate the value of t-statistics.* denote significance at the 5% level

Table 4:
Effect of financial contagion between mature and emerging markets in Covid – 19 period

coefficient is 0.607), United Kingdom (Regression coefficient is 0.231), Malaysia (Regression coefficient is 0.126) and Thailand (Regression coefficient is 0.239). Taken as a whole, 14 countries have a statistically significant influence on developed countries, and developed countries have a statistically significant influence on 13 countries. 12 countries have a statistically significant effect on developing countries, and developing countries have a statistically significant influence on 12 countries. Thus, it can be affirmed that developed countries have a greater degree of financial spread than developing countries.

4.2.2. Effect of financial contagion between mature and emerging markets in covid - 19 period

The table above shows the financial impact of countries during the entire Covid-19 period, from January 1, 2020 to February 23, 2022. The results of the study indicate that there is financial contagion between countries.

Developed and developing countries interact with each other in terms of stock indexes. Brazil is the country with the largest financial spread during the Covid - 19 period. In which, there are 5 countries that have a statistically significant influence on Brazil's stock return, including: United States (Regression coefficient is 0.328), Germany (Regression coefficient is 0.348), United Kingdom (Regression coefficient is 0.370), Switzerland (Regression coefficient is -0.586) and Malaysia (Regression coefficient is 0.477). The regression coefficients are all positive indicating a positive effect of the above markets on the Brazilian stock return, however the Switzerland regression coefficient of -0.586 indicates a negative effect on the Brazilian stock return. Brazil affects 4 countries including: the United Kingdom (Regression coefficient is 0.160), Switzerland (Regression coefficient is -0.180), Malaysia (Regression coefficient is 0.232) and Thailand (Regression coefficient is -0.139). In which, the correlation coefficient between Brazil and, Swit-
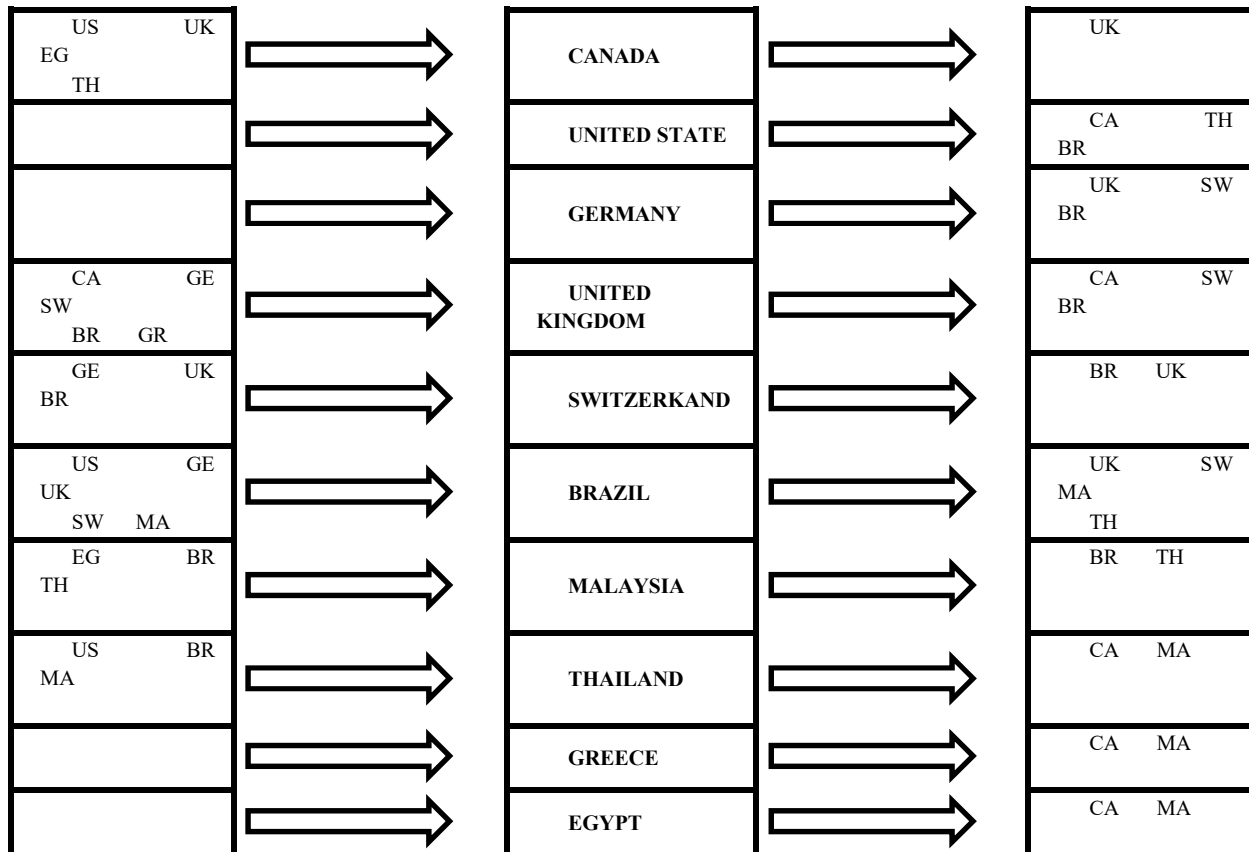
Figure 3:
Impacts Between Countries During The Covid -19 Period

zerland and Thailand is negative, showing the negative influence of Brazil's economic situation on Switzerland and Thailand. Overall, 12 countries have a statistically significant effect on developed countries, and developed countries have a statistically significant influence on 12 countries. 11 countries have a statistically significant effect on developing countries, and developing countries have a statistically significant effect on 12 countries. Thus, it can be affirmed that developed countries have a greater degree of financial spread than developing countries during the Covid-19 period, but the difference is not much.

4.2.1. Effect of financial contagion between mature and emerging markets in post-Covid pandemic and the war of Russia - Ukraine

The United Kingdom is the country with the largest level of financial contagion in the post-Covid period and the war of Russia - Ukraine. In which, there are 4 countries that have a statistically significant influence on the stock return of the United Kingdom, including: Germany (Regression coefficient is 0.173), Switzerland (Regression coefficient is 0.371), Brazil (Regression coefficient is 0.155) and Greece (Regression coefficient is 0.161). The regression coefficients are all positive, showing the positive impact of the above markets on the stock return of the United Kingdom.

United Kingdom has a statistically significant influence on 2 countries including: Germany (Regression coefficient is 0.548) and Switzerland (Regression coefficient is 0.429). Overall, 9

	TSX	SP	DAX	FTSE	SMI	IBX50	KLSE	Bangkok	Athens	EGX
TSX		0.746 *	-0.064	-0.084	0.166	0.395	0.139	0.230	-0.194	-0.247
SP	0.339		0.110	0.039	0.231 *	0.140	0.125	0.000	-0.106	0.025
DAX	0.001	0.024		0.173 *	0.210	-0.270	0.036	0.073	0.361	0.127
FTSE	0.018	0.059	0.548 *		0.429 *	1.019	-0.149	0.008	0.496	0.043
SMI	0.188	0.531 *	0.371	0.371 *		-0.638	-0.159	-0.172	0.273	-0.022
IBX50	0.071	0.022	-0.118	0.155 *	-0.137		0.099	0.069	-0.043	-0.155
KLSE	0.202	0.025	-0.031	-0.086	-0.125	0.390		0.221	0.397	0.531 *
Bangkok	0.288	0.072	0.094	0.107	-0.121	0.365	0.234		0.323	0.166
Athens	-0.066	-0.081	0.200 *	0.161 *	0.050	-0.063	0.112	0.085		-0.052
EGX	-0.092	0.072	-0.021	0.056	0.005	-0.337	0.075	0.066	0.001	

Notes: Figures in parentheses indicate the value of t-statistics.* denote significance at the 5% level

Table 5:
Effect of financial contagion between mature and emerging markets in post-Covid pandemic and the war of Russia - Ukraine

The table above shows the financial influence of countries in the entire post-Covid period and the war of Russia - Ukraine. The results of the study indicate that there is financial contagion between countries. Developed and developing countries interact with each other in terms of stock indexes.

countries have a statistically significant influence on developed countries, and developed countries have a statistically significant influence on 7 countries. 1 country has a statistically significant effect on developing countries, and developing countries has a statistically significant in-

fluence on 5 countries. Thus, it can be affirmed that developed countries have a greater degree of financial contagion than developing countries in the post-Covid period and the war of Russia - Ukraine. The difference in financial contagion is relatively large among developed countries, but developing countries do not have much influence.

volvement in global value chains are contributing factors. These countries were cushioned from the worst of the crisis. The study also looked at the financial ripple effects of the conflict between Russia and Ukraine. The effects of this geopolitical struggle were more nuanced than those of the Covid-19 epidemic. Even if developing
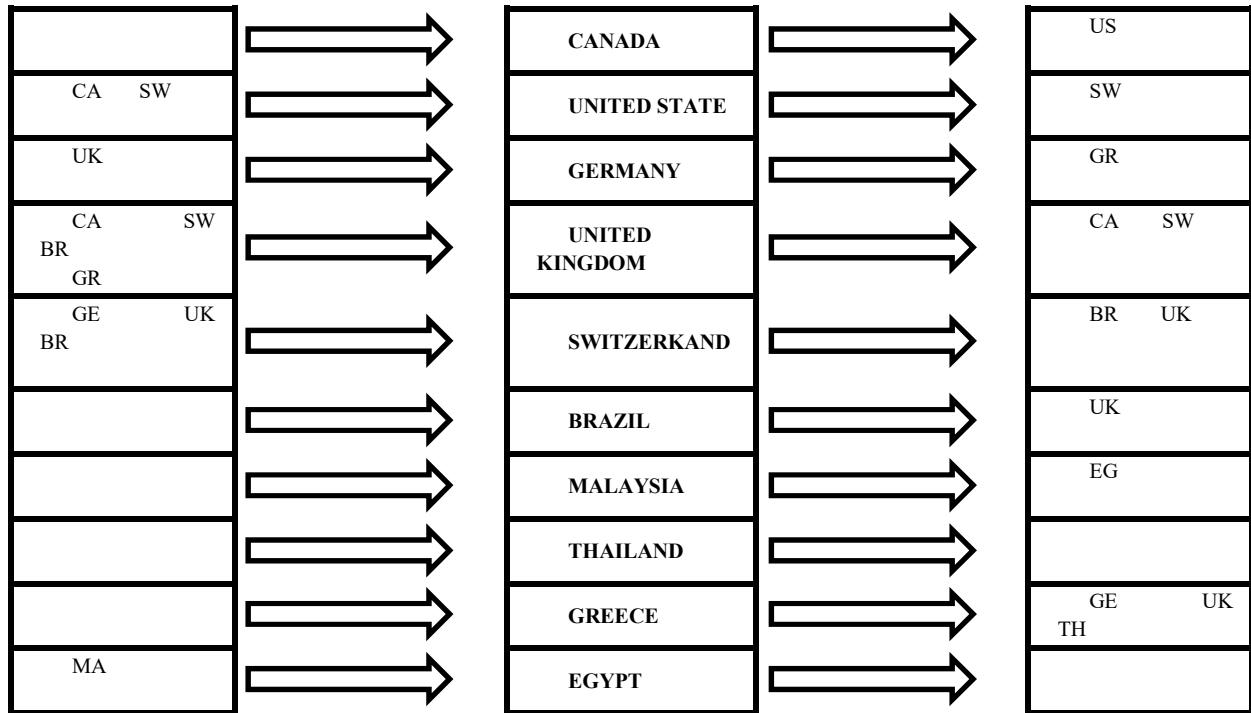

Figure 4:
Impacts between countries in post-Covid pandemic and the war of Russia - Ukraine

The Covid-19 epidemic provided a one-of-a-kind opportunity to examine the dynamics of a financial pandemic. Due to their greater specialization and integration into global supply networks, developed nations were more vulnerable to the spread of the financial crisis. This occurred because to uncertainty in the financial markets, decreased consumer demand, and interruptions in international commerce. The United States and the United Kingdom, along with other developed nations were instrumental in spreading the financial contagion that accompanied the Covid-19 outbreak. The global financial markets were profoundly impacted by their economic policies and stability. During the Covid-19 outbreak, underdeveloped nations showed less monetary contagion than industrialized ones. The lack of specialisation and limited in-

nations didn't fight in the war itself, they were nonetheless impacted by things like oil price swings and inflation. However, developed nations intervened more directly in the conflict between Russia and Ukraine. The sanctions they placed on Russia sent shockwaves across the global economy. Furthermore, the interconnection of the global financial system is highlighted by its direct engagement in geopolitical events. It would be foolish to minimise the developed nations' weight in international monetary and economic affairs. The rest of the world, and especially developing nations, feel the effects of their economic policies, trade practises, and geopolitical activities. The study has major consequences for public policy. Financial contagion is a real threat that has to be taken seriously by policymakers everywhere, in both rich and developing nations.

Some such strategies include broadening one's network of trading partners, strengthening one's financial position, and strengthening international collaboration in times of crisis. While this study does fill certain gaps, further investigation is needed. More research is needed to better understand the mechanics of financial contagion, the function of financial institutions, and the efficacy of policy actions in preventing the spread of crises. Study's findings confirm the presence of financial contagion between industrialised and developing nations, with the former showing a greater tendency for spreading the phenomenon because to their economic specialization and worldwide importance. varied crises have varied degrees of contagion, as seen by the Covid-19 outbreak and the War of Russia and Ukraine. In order to successfully manage the intricacies of a globally linked economy, policymakers and market players alike must have a firm grasp of these processes. Proactive steps are essential to control and reduce the risks associated with financial contagion, and it is obvious that the financial health of any country, established or developing, is inextricably related to the larger international financial environment.

6.   Conclusion

Research results show that there is financial contagion between developed countries and developing countries, but there are different levels between countries in both the period of Covid - 19, after Covid - 19 and War of Russia and Ukraine. In particular, developed countries have a stronger spread than developing countries. In fact, developed countries have a high degree of specialization, so they often focus on their strengths instead of producing themselves. Developed countries regularly import goods from developing countries and export those of high economic value. Therefore, developed countries have a strong influence on other countries, especially with developing countries. The financial contagion effect mainly between developed countries but developing countries have very little financial contagion. . Unlike the COVID-19 pandemic, the War of Russia and Ukraine, although affecting the world, has different levels. Undeveloped countries have almost no direct involvement in the war but are only indirectly affected by oil prices, inflation,... Developed countries such as the US, United King-

dom,... have direct involvement such as: imposing sanctions on Russia. Therefore, it is understandable that financial contagion occurs more in developed countries. In conclusion, this study's research findings provide new insight into the dynamics of financial contagion between industrialized and developing nations, with a focus on the Covid-19 and War of Russia and Ukraine epochs. The results indicate that financial contagion is a dynamic and diverse phenomena affected by a wide range of variables, such as economic specialization, trade patterns, and geopolitical developments. There is factual proof that rich and developing nations may be financially contagious to one another. The extent to which a country is affected by this virus depends on a number of factors, including its economic growth and amount of integration into the global financial system. In sum, the findings of this study shed light on the complex network of financial contagion that links industrialized and developing nations. COVID-19 and the War in Russia and Ukraine are only two examples of how this occurrence demonstrates the intricate nature of global economic interdependencies. In the next sections, we will explore the deeper meaning and subtlety of these results. This study shows that the process of financial contagion is not the same in every country. Instead, it's a complex phenomenon driven by a wide range of elements. Economic specialisation is a major contributor to the difference in contagion between industrialised and poor nations. Economically, developed nations specialise heavily on their strengths and primary sectors. Because of their narrow focus, developed nations often must depend on imports from emerging nations to satisfy their own demand. Developed nations were especially susceptible to the effects of the Covid-19 pandemic because of their dependence on global supply systems, which were disrupted as a consequence of the epidemic. In addition, rich countries often ship low-cost goods and services to emerging markets. Their presence on the international economic scene is bolstered by this export-import dynamic. This global interdependence was highlighted by the Covid-19 epidemic, which caused the global economic collapse to have repercussions in developing countries, particularly in the areas of industry, agriculture, and technology. Developed nations were shown to be not just

economic powerhouses but also key participants in global financial markets during the Covid-19 epidemic. The crisis solutions they implemented, such as changes to monetary policy and stimulus packages, significantly impacted global financial stability. These measures often triggered more volatility in emerging markets, which in turn caused capital flight and currency devaluation in developing nations. However, poorer nations were more resistant to the financial impact of the Covid-19 epidemic. They were able to weather the storm because their economies were more diversified and they were less reliant on international supply networks. Many underdeveloped countries, especially those with sizable agricultural industries, were better able to absorb the first economic blows from the epidemic than their more developed counterparts. In the conflict between Russia and Ukraine, however, new factors entered the picture. The effects of this geopolitical battle on financial contagion were more subtle, despite the fact that they had far-reaching repercussions for global stability. Most developing nations did not actively participate in the conflict. However, variables like as shifts in oil prices had knock-on effects on their economies and hence influenced them indirectly. When industrialized nations like the United States and the United Kingdom imposed sanctions on Russia, they took a more active part in the war. While these sanctions were designed to achieve certain geopolitical goals, they also had unforeseen effects on international financial markets. They caused havoc with international commerce and financial flows, hurting economies all around the world, including Russia's. The study's results emphasize the critical role developed nations play in determining the path of financial contagion. The rest of the world, and especially developing countries, feel the effects of their economic policies, trade practices, and geopolitical activities. Due to the interconnected nature of the global economy, the risks of financial contagion must be managed and mitigated in a concerted, cooperative effort. There has to be a proactive reaction from policymakers in both developed and developing nations to the possibility of a contagion. This involves increasing financial resilience via smart fiscal and monetary policies and strengthening international collaboration during crises, as well as diversifying trade partners to lessen dependence on a single market. In addition, nations may be better prepared to resist the shocks of contagion if they create strong financial institutions and regulatory frameworks. This work sheds light on the mechanics of financial contagion, but there is still a lot of opportunity for exploration in this area. Financial institutions, international investments, and investor behaviour may all be explored in more depth in future research that investigates the causes and effects of financial contagion. Assessing the efficacy of policy interventions in stemming the spread of disease and fostering economic recovery is another important area for study. In conclusion, this study's findings provide insight on the complexity and diversity of financial contagion across industrialized and developing nations. various crises have various amounts of contagion because of factors including economic specialization, trading patterns, and geopolitical developments. In order to successfully manage the intricacies of a globally linked economy, policymakers and market players must have a firm grasp of these dynamics. As time goes on, the worldwide financial environment will remain inextricably connected to the financial health of countries, both established and emerging. The dangers of financial contagion in today's globally linked society can only be managed and mitigated via proactive measures and international cooperation.

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