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Article

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Cogent Business & Management

Provided in Cooperation with:

Taylor & Francis Group

Suggested Citation: Aftab, Rehan; Naveed, Muhammad (2022) : Is financial institutions' stability of BRICS block responsive to uncertain dimensions?, Cogent Business & Management, ISSN 2331-1975, Taylor & Francis, Abingdon, Vol. 9, Iss. 1, pp. 1-13, <https://doi.org/10.1080/23311975.2021.2010484>

This Version is available at:

<https://hdl.handle.net/10419/287310>

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To cite this article: Rehan Aftab & Muhammad Naveed (2022) Is financial institutions' stability of BRICS block responsive to uncertain dimensions?, Cogent Business & Management, 9:1, 2010484, DOI: [10.1080/23311975.2021.2010484](https://doi.org/10.1080/23311975.2021.2010484)

To link to this article: <https://doi.org/10.1080/23311975.2021.2010484>



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Published online: 21 Dec 2021.



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Received 29 May 2021
Accepted 20 November 2021

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BANKING & FINANCE | RESEARCH ARTICLE

Is financial institutions' stability of BRICS block responsive to uncertain dimensions?

Rehan Aftab^{1*} and Muhammad Naveed²

Abstract: The aim of this seminal paper is the empirical analysis of geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases' impact on financial institutions' stability at the country level. The quantitative research approach followed by regression analysis is employed using monthly time series data between January 2000 and January 2021. Separate models are performed for individual countries with and without control variables. The outcomes of this work suggest that geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases hold adverse effects on the financial institutions' stability. There is evidence of declining financial institutions' stability with the rising level of predicting dimensions. The research is limited to the BRICS block but has paramount significance for literature enrichment and policymakers. The findings can assist decision-makers to plan for uncertain events disrupting the financial system. More rigorous research techniques can be levered to endorse the consistency of the evidence. The dimensions adopted in this study address the ongoing paradigm of research. The financial institutions' stability at the country level is a value addition of this work with the selection of persistent and novel predictors of financial systems like financial stress and infectious diseases.

Subjects: Corporate Finance; Banking; Credit & Credit Institutions

Keywords: Geopolitical risk; economic policy uncertainty; financial stress; infectious diseases; financial institutions stability

ABOUT THE AUTHOR

We belong to the same institute but have different roles to play in academic research. We are actively participating in the research studies directed to examine the modalities of the financial system and financial markets. This work is a fine instance of our interest to look at the financial system with an agile approach. We are looking into varying changes in the financial markets as part of our research activities.

PUBLIC INTEREST STATEMENT

This study has far stretched implications for different stakeholders who are affected by distractions in the financial and economic environment. The uncertain happenings can change the way of thinking and these can hamper the individual capability to make the right decision. The general public as the key stakeholder of the issue of "financial stability" must understand that their interests are linked to the economic environment they are living in. Factors like rising financial stress and contagion diseases generate harmful consequences for financial systems and the general public is the ultimate victim of this disruption. So, the public must educate itself on the latent dynamics of the financial and economic landscape.

1. Introduction

The dynamic nature of the economic and financial world undergoes consistent changes due to uncertain events in the external environment. The economic theorists suggest that uncertain situations are of paramount significance for economic agents while making decisions in the financial world (Borch, 2015). Extending this notion, this paper has its basis for examining the financial system and the uncertain happenings bringing changes therein. Historically, several events and economic shocks of uncertain nature have devastated the normal course of financial institutions as the key component of the financial system (Sabaté, 2016). The stability of financial institutions becomes questionable with the changing paradigms of the external world. Financial stability in terms of Čihák and Hesse (2010) is the smooth functioning of the financial system where funds management and financial intermediation are efficient, and the financial system can absorb external shocks.

Financial markets as one component of the financial system are rigorously analyzed for their volatility in the presence of numerous dimensions like geopolitical risk, economic policy uncertainty, financial stress, and other systemic shocks like the Global Financial Crisis (BenSaïda et al., 2018; Kannadhasan & Das, 2020). Recently, the health uncertainty as Covid-19 has also distracted the financial systems around the globe and the aftermaths of this ongoing pandemic are eminent from financial downturns (Villarreal, 2020). These distractions are also harmful to small and medium-scale enterprises (Aftab et al., 2021). So, there emerges a need for scholars to investigate the effects that different sorts of uncontrollable events and persisted events have on the normal course of the financial system.

The analysis of the rising level of uncertainties and financial markets as constituents of the financial system is evident from empirical evidence from different strands of economies (Apergis et al., 2018; Gozgor et al., 2016; Zhang et al., 2019). These authors worked out geopolitical risk, economic policy uncertainty, financial stress, and pandemic in the perspective of financial market volatility. The financial system has two pillars for funds flow and management usually recognized as financial markets and financial institutions. Financial institutions also have a role to play in the financial outlook along with financial markets (Berndsen et al., 2018). So, there is a need for analyzing the financial institutions' stability to ascertain the financial outlook in presence of numerous factors including geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases.

Jones et al. (2012) linked an uncertain environment with the institutional-level stability in the United States. Gilchrist et al. (2014) related uncertainties with the financial disruptions in numerous countries. Moreover, the drivers of financial institutions' stability are rigorously analyzed in the existing body of knowledge at sector and firm-specific levels. A recent work of Phan et al. (2021) has empirically analyzed the effect of economic policy uncertainty on financial stability driven by financial institutions of 23 countries. It only used the sample of developed countries and provided the basis to extend the effort with more rigor to different economic blocks. So, the emerging nations BRICS block, financial institutions' stability is under review of this paper.

The financial institutions' stability in literature is analyzed in the context of the banking sector. The existing empirical evidence concludes enormous drivers of financial stability in any country on the sector and individual institution levels. Global factors disrupting the financial system through impact on the financial market also need analysis in terms of impact on financial institutions within the system. Phan et al. (2021) study in recent times provides the basis for establishing the link between global-level factors and country-level financial institutions' stability.

So, this paper aims to empirically examine the impact of a few global drivers of the financial system. How geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases affect financial institutions' stability? The financial institutions' stability is taken on the country level for BRICS block. It represents a set of economies at an advanced stage of development

chasing the developed nations. Due to the interlinked financial systems of the world, the global-level factors seem to have the same implications for all linked countries.

This paper holds paramount significance for scholars and policymakers. The analysis of financial institutions concerning a few global drivers of change enriches the financial institutions and markets literature. The policymakers can have a look at all those factors that can globally interfere in their institutions and are mostly uncontrollable. Contingency planning becomes easier with such established relationships in the literature. Risk management frameworks can be established by financial institutions with due regard to these uncertain elements. Future studies can develop more econometrics techniques to address the underlying research question. The sector-specific and firm-specific controls can be employed to have a deep insight into the financial institutions' stability. The work should be extended to other developing countries as well.

2. Literature review

The theories of standard finance have an indirect link with the level of uncertainty and financial institutions' stability. Macroeconomic factors like inflation have their role to play in the ascertainment of financial soundness in the country. The uncertain events influence the macroeconomic factors, and this effect is carried over to the financial system. So, the traditional theories like CAPM and DDM have an indirect link with the financial institution's stability and its drivers. Whereas the economic theory creates a direct link of the global uncertain drivers with the level of financial institutions' stability in the country. Economic agents make their decisions in the agile and uncertain world hence leading to distorted happenings in the financial system (Borch, 2015). So, this theoretical perspective is carried out throughout this work. The activities of economic agents trigger changes in the financial system and these agents are influenced by few known global factors having a ripple down effect on financial markets. These factors as reviewed in this work are geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases.

Financial system stability is primarily dependent on the stability of its financial institutions and the resilience nature of financial institutions defines the notion of financial institutions' stability (Berndsen et al., 2018). The monetary aspect of the financial system and financial stability are two different aspects but are associated with each other, so the external events influence both. So, both monetary and financial institutions' stability policymakers work together on integrated policies (Phan et al., 2021; Smets, 2018). The uncertain external environment affects the financial system of the countries due to financial integration. An uncertain event in one country may affect the financial system of another country, this spillover effect is systemic Gilchrist et al. (2014). These uncertainties bring financial distortion and decline the overall stability of the financial systems.

The dimensions examined in this paper include geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases. Geopolitical risk develops with the level of tensions and conflicts between the states. The geopolitical risk during wars is on the higher side (Lee & Wang, 2021). Secondly, it is the economic policy uncertainty, which is the unpredictability of government policies and decisions. Stakeholders of an economic system are when unaware of government decisions, this spikes the economic policy uncertainty level (Al-Thaqeb & Algharabali, 2019). Thirdly, it is financial stress representing the unfavorable movement of financial variables leading to an uncertain situation for economic users (Aboura & van Roye, 2017). Lastly, infectious diseases as another dimension in this paper include the several outbreaks of the 21st century. This dimension captures the events of disease outbreaks as epidemics and pandemics as declared by World Health Organization (Villarreal, 2020).

Likewise, the financial stress that is pressure on the financial variables of the economies also harms the financial system and its constituents (Apostolakis & Papadopoulos, 2015). The regression analysis based on the OLS regression process identified the impact of financial stress on the financial institution's stability. The rising level of financial stress carries financial instability from one financial constituent to another. It narrates that the financial institutions' stability is not apart

from the financial stability of financial markets. So, both constituents of the financial system have to take effect of financial stress levels (Apostolakis & Papadopoulos, 2015). Lee et al. (2017) analyzed financial institutions' stability as a function of bank-specific factors and economic policy uncertainty. They concluded that the bank-specific factors and the level of economic policy uncertainty hold a significant impact on the overall financial institutions' stability. They followed the regression model for estimation and concluded that the bank-specific factors and economic policy uncertainty have a significant and negative impact on the financial institutions' stability. Caglayan and Xu (2019) studied financial institutions' stability in response to the economic policy uncertainty. Banking-level stability was the concerning area in the work of Caglayan and Xu (2019), who found that the level of economic policy uncertainty significantly and negatively impacts the stability of banks in the sector. Loan loss provisions and non-performing loans were constituents taken from the banking sector for analysis of its stability.

Baum et al. (2018) extended the analysis of financial institutions' stability to numerous uncertain events in the market. The uncertain situations in the external financial world hold a significant impact on the financial institution's stability. The financial stability and growth depend on the financial stress level of advanced economies. Apostolakis and Papadopoulos (2019) studied the sample of 19 advanced economies using the autoregressive model for the possible impact of financial stress on the financial institutions' stability and growth. They completed the work in a dynamic context with the application of a dynamic estimation model. The findings suggest a negative and significant impact of financial stress on the financial institutions' stability and growth. Phan et al. (2021) examined the financial institutions' stability of 23 different developed countries in response to changing economic policy uncertainty. The financial institutions' stability was measured using a z-score that scales the institutions' probability to default. The work concluded that a rising level of economic policy uncertainty declines the level of financial institutions' stability of 23 developed countries on the country level. Baig et al. (2021) analyzed the financial institutions' stability in times of the recent pandemic. The study found that pandemic has negatively affected the financial institutions' stability of the United States. They also found similar effects of a pandemic for the United States equity markets. Regression was used to estimate the coefficients explaining the impact of a pandemic on the financial institutions' stability. The model proved significant to analyze the impact of a pandemic on the financial institutions' stability. The recent work of Phan et al. (2021) analyzed the impact of economic policy uncertainty with the control factors of the macro-economic environment on financial institutions' stability. The authors concluded that the stability-level shifts with the changes in economic policy uncertainty.

Aysan et al. (2019) using autoregressive modeling analyzed the efficacy of geopolitical risk in predicting financial market volatility. The geopolitical risk proved a significant predictor of financial market volatility. Gkillas et al. (2020) analyzed commodity market behavior in response to geopolitical risk and they concluded the adverse and significant effect of geopolitical risk on commodity prices. In the context of geopolitical risk, not much has been evaluated for country-level financial institutions' stability. The reviewed empirical evidence related to geopolitical risk and financial system is mostly concerned with one constituent of the financial system that is financial markets. This derives the need for extending the analysis in the context of geopolitical risk relationship with the soundness of financial institutions. So, this notion is extended in the paper.

Infectious diseases historically have been a concerning dimension for financial systems due to their ripple effect. Many infectious emergencies got the attention of international researchers and their associated financial significance was examined (Kilgo et al., 2018). In times of recent pandemic, researchers started to examine both constituents of the financial system, financial markets, and financial institutions, for the possible impact of contagion disease. Bouri et al. (2020); Bai et al. (2020) attempted to rigorously examine the financial markets' response to the health crisis. The oil indices and stock indices are examined in their work and found to have a negative effect on the health crisis. Dynamic models were employed by these authors to examine the impact of the crisis

on the oil indices and stock indices. VAR is the basic model used for estimations and finding the significant outcomes for researchers.

Economic watchdogs and experts of the financial system viewed the current situation as disastrous for the financial system. It can have spillover effects, which can carry to other financial systems from origination (Li et al., 2020). After reviewing a few of the dominant studies after the sudden surge of the pandemic, the financial institutions' stability seems an underexamined area of research. The existing literature has focused on financial markets as a single constituent of the financial system. Financial institutions need more empirical examination to identify the accurate effect of a pandemic on its viability. So, in response to infectious disease, financial institutions' stability is under the question of this work.

The review of relevant literature and empirical evidence from the different economies, financial systems endorse financial institutions' stability as the function of numerous uncertainties in the external world. Economic policy uncertainty is the most studied dimension having an impact on financial institutions' stability. In recent times, health emergency has also emerged as a driver of financial institutions' stability. The least work has been evaluated in terms of uncertainties influencing the normal course of financial institutions. The dimensions of this work as geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases have relevance with the financial system as their occurrences have an impact on financial institutions' stability. Financial institution stability in literature is mostly evaluated on banking-level dimensions, and the analysis of financial institution stability on a country level is almost the missing link in the literature. So, having new dimensions of uncertainties, this work also has the evaluation of financial stability on the country level.

3. Methodology

3.1. Research design

The scope of this paper confines analyzing the impact of geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases on financial institutions' stability. In line with the aim of the paper, the quantitative research approach better fits with the regression model as an econometric technique for statistical analysis. The time-series data for all variables are extracted from secondary sources from January 2000 till January 2021. With this period, the data frequency is monthly for all dimensions and is selected for bringing uniformity in observations of variables at the modeling phase. The population pertinent to the research scope includes all countries with developed financial systems but the time and resource constraints have confined the final sample to a selection of BRICS countries.

3.2. Dependent and independent variables data and measures

Geopolitical risk is the outcome of growing tensions between the countries in a specific region or on the global fronts. The geopolitical risk is measured using an established index that is the Geopolitical Risk Index (GPRI), it is an effort of Dario Caldara and Matteo Iacoviello. Its data for the stated time series (January 2000—January 2021) is sourced from Matteo Iacoviello Geopolitical Risk Index Database. This index considers geopolitical tensions from various regions for its construction and has an aspect of cross-border events.

For economic policy uncertainty, Baker, Bloom, and Davis global economic policy uncertainty index is adopted for its measurement (Davis, 2016). It describes the economic policy uncertainty due to unpredictable decisions of governments in 21 different countries. It provides monthly statistics for economic policy uncertainty as required in this work.

Likewise, the financial stress index approved and constructed by the Office of Financial Research is taken for the measurement of financial stress in this paper. Its efficacy for the empirical analysis is endorsed by Ozcelebi (2020). It measures the stress level of financial variables across emerging, developed, and developing economies.

Similarly, infectious diseases as predictors are measured using Baker et al. (2020) equity market volatility tracker. It is an index based on numerous health uncertainties. Its monthly frequency is obtained using reporting of health-related keywords from published sources to construct this index.

Lastly, the measurement of financial institutions' stability is based on the capital adequacy of the whole financial system at the country level. Capital adequacy as a proxy measure of financial institutions' stability across different countries of the World is part of the World Bank list of financial soundness indicators. The World Bank database provides monthly reporting of financial institutions' capital adequacy aimed at measuring the overall financial soundness of the underlying financial systems.

3.3. Control variables data and measures

Financial institutions' stability can get an impact of macroeconomic variables as reported by Phan et al. (2021). So, inflation rate (INF), the growth rate of GDP (GDP), and gross domestic product per capita (GDPC) are taken as control variables in the modeling. These controls ensure the robustness of outcomes in the modeling process. Ramasamy and Abar (2015) also endorsed the use of macroeconomic variables while examining financial stability. The monthly data for control variables is extracted for the stated time series (January 2000—January 2021) from FRED economic data and the World Bank database.

3.4. Econometric model

The regression equations are developed below for analyzing the impact of geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases on financial institutions' stability. Equation 1 only includes the impact of independent variables on the dependent variable. Whereas equation 2 includes the impact on control variables analyzing the robustness of the modeling. The same equations are separately performed for different countries included in the BRICS block. OLS regression is performed for analysis as it is more reliable when it comes to time series data with stationarity at level or first difference. The same OLS regression model is used in the work of (Phan et al., 2021). The basic estimation equations are presented below:

$$CA_{(i,t)} = \alpha + \beta(GPRI)_{i,t} + \beta(GEPUI)_{i,t} + \beta(FSI)_{i,t} + \beta(EMV)_{i,t} + \epsilon_1 \quad (\text{Equation – 1})$$

$$CA_{(i,t)} = \alpha + \beta(GPRI)_{i,t} + \beta(GEPUI)_{i,t} + \beta(FSI)_{i,t} + \beta(EMV)_{i,t} + \beta(GDPPC)_{i,t} + \beta(\Delta GDP)_{i,t} + \beta(\Delta CPI)_{i,t} + \epsilon_1 \quad (\text{Equation – 2})$$

In the above equations, the CA represents capital adequacy as a measure of financial institutions' stability (i for a specific country and t for a specific time). GPRI is the measuring index of geopolitical risk. GEPUI is the measuring index of economic policy uncertainty. FSI is the financial stress index measuring financial stress. EMV is the infectious diseases market volatility tracker index as a measure of infectious diseases. GDPPC is the country's gross domestic product per capita. ΔGDP is the percentage change in GDP measuring the growth rate of GDP. ΔCPI is a change in the consumer price index measuring the inflation rate.

4. Data analysis

The preliminary analysis constitutes correlation analysis and descriptive analysis. Later, the analysis of econometric models is performed. At first, Table 1,2 has the correlation values for all independent variables in the econometric model.

The correlation values of all independent variables are significant and the relationship between the variables is not much strengthening, which may have led to a weak theoretical and econometric model. Following the correlation analysis, it is the descriptive analysis of variables in table 3.

The total number of observations for all variables in the chosen time series is equivalent to 253. It is a balanced figure for all variables. The other important statistic is the unit root testing using

Table 1. Has basic details related to variables under discussion

Variables/Frequency	Measure	Source
Geopolitical Risk	Geopolitical Risk Index (GPRI)	Matteo Iacoviello Geopolitical Risk Index Database.
Economic Policy Uncertainty	Global Economic Policy Uncertainty Index (GEPUI)	Baker, Bloom, and Davis Global Economic Policy Uncertainty Index.
Financial Stress	Financial Stress Index (FSI)	Office of Financial Research (FSI).
Infectious Diseases	Daily Infectious Disease Equity Market Volatility Tracker (EMV)	Daily Infectious Disease Equity Market Volatility Tracker Baker et al. (2020).
Financial Institutions Stability	Capital Adequacy (CA)	Financial Soundness Indicator FRED Economic Data—World Bank Data.
Gross Domestic Product Per Capita (GDPC)	Country's GDP per capita	FRED Economic Data—World Bank Data.
Growth Rate of GDP (GDP)	Percent changes in GDP	FRED Economic Data—World Bank Data.
Inflation Rate (INF)	Change in the consumer price index	FRED Economic Data—World Bank Data.

the ADF test. The null hypothesis that there is a unit root is significantly rejected as the p values for all variables are significant below 1% level of significance. The time series is stationary and is suitable for analysis as depicted by the ADF test. With this analysis, the main empirical model analysis is shown in [Table 4](#).

Dependent variable: Capital Adequacy, first row for coefficients, second row with {} for p-values, third row with () denotes t-statistic.

The regression analysis in [table 4](#) shows 10 different models performed using 2 basic equations. Equation 1 is used to perform model 1 to model 5. Each time capital adequacy as a dependent variable is changed for changing countries. From model 6 through model 10, the basic equation 2 is separately performed for each country included in the BRICS block.

In column 1, the capital adequacy of Brazilian financial institutions' stability is the dependent variable. Geopolitical risk, economic policy uncertainty, financial stress and equity market volatility tracker for infectious diseases are having negative and significant impact on the Brazilian financial institutions' stability ($GR = -0.039$, $p = 0.012$, $EPU = -0.047$, $p = 0.001$, $FS = -0.004$, $p = 0.035$, $EMV = -0.023$, $p = 0.011$). The independent variables explain the 72% variation in the Brazilian financial institutions' stability. While in column 6 control variables are included with the same set of independent variables for Brazil. The impact of independent variables is not significantly and directionally changed, whereas control variables have their nature of impacts on the financial institution's stability.

In column 2, Russian financial institutions' stability is measured while taking the geopolitical risk, economic policy uncertainty, financial stress, and equity market volatility tracker for infectious diseases as predictors. The independent variables bring 70% variability in the capital adequacy and the impact is negatively significant as well ($GR = -0.022$, $p = 0.000$, $EPU = -0.027$, $p = 0.003$, $FS = -0.050$, $p = 0.000$, $EMV = -0.092$, $p = 0.000$). This infers that the rising level of uncertainty due to independent variables brings a decrease in the financial institution's stability of Russia. Whereas in column 7 control variables are included for Russia to check robustness with the same set of independent variables. Even in this model, the impact of independent variables is not significantly and directionally changed. While the control variables have their nature of impacts on the financial institution's stability.

Table 2. Correlation analysis

	GPRI	GEPUI	FSI	EMV	GDPPC	ΔGDP	ΔCPI
<i>GPRI</i>	1						
<i>GEPUI</i>	0.286**	1					
<i>FSI</i>	-0.396*	0.426**	1				
<i>EMV</i>	-0.226*	0.597**	0.146*	1			
<i>GDPPC</i>	0.440	0.002*	0.505	0.429**	1		
<i>ΔGDP</i>	-0.047**	0.329	0.127**	0.218*	0.154	1	
<i>ΔCPI</i>	-0.621	0.591**	-0.457	0.482	0.381*	0.284*	1

*Denotes statistical significance at 1 %, ** denotes statistical significance at 5 %, * denotes statistical significance at 10 %.

Table 3. Descriptive summary

	Obs.	Mean	S.D	ADF	Sig
<i>GPRI</i>	253	105.77	71.36	-4.71	0.000
<i>GEPUI</i>	253	133.62	69.34	-3.44	0.000
<i>FS</i>	253	6.68	93.68	-3.52	0.000
<i>EMV</i>	253	50.25	168.5	-6.32	0.000
<i>GDPPC</i>	253	2.01	0.94	-3.49	0.000
<i>ΔGDP</i>	253	0.12	0.04	-4.18	0.000
<i>ΔCPI</i>	253	0.15	0.06	-4.26	0.000
<i>CA (Brazil)</i>	253	9.19	4.22	-3.75	0.000
<i>CA (Russia)</i>	253	10.37	5.9	-4.9	0.000
<i>CA (India)</i>	253	11.84	4.87	-3.54	0.000
<i>CA (China)</i>	253	12.64	3.44	-3.21	0.000
<i>CA (SA)</i>	253	10.27	4.01	-3.61	0.000

In column 3, the geopolitical risk, economic policy uncertainty, financial stress and equity market volatility tracker for infectious diseases represents negative and significant impact on the financial institutions' stability of India ($GR = -0.001$, $p = 0.005$, $EPU = -0.078$, $p = 0.006$, $FS = -0.062$, $p = 0.005$, $EMV = -0.034$, $p = 0.000$). These variables explain an overall 79% variability in the financial institutions' stability of India. Likewise, in column 8 control variables are included for India with the same set of independent variables to examine the capital adequacy of the country. While controlling for control variables, the independent variables still have a significant and directional impact.

In the 4th column, the IVs explain about 81% variation in the financial institutions' stability of China. The geopolitical risk, economic policy uncertainty, financial stress and equity market volatility tracker for infectious diseases shows negative and significant impact on the financial institutions' stability of China ($GR = -0.017$, $p = 0.021$, $EPU = -0.018$, $p = 0.003$, $FS = -0.093$, $p = 0.005$, $EMV = -0.060$, $p = 0.000$). Model 9 represents the impact of geopolitical risk, economic policy uncertainty, financial stress, and equity market volatility tracker for infectious diseases on Chinese financial institutions' stability with controlled macroeconomic variables. The outcomes for independent variables are alike to the model without controls with minute differences. Control variables have their varying nature of influence.

Table 4. Regression (country-wise analysis)

	1	2	3	4	5	6	7	8	9	10
	Brazil	Russia	India	China	South Af.	Brazil	Russia	India	China	South Af.
GPRI	-0.039 {0.012} (-2.019)	-0.022 {0.000} (-3.939)	-0.001 {0.005} (-2.582)	-0.017 {0.021} (-2.007)	-0.084 {0.061} (-1.899)	-0.009 {0.043} (-1.999)	-0.019 {0.000} (-3.719)	-0.092 {0.000} (-3.326)	-0.099 {0.002} (-3.124)	-0.816 {0.059} (-1.900)
GEPUJ	-0.047 {0.001} (-3.193)	-0.027 {0.003} (-3.001)	-0.078 {0.006} (-2.528)	-0.018 {0.003} (-2.878)	-0.010 {0.095} (-1.655)	-0.081 {0.000} (-3.991)	-0.079 {0.002} (-2.918)	-0.048 {0.003} (-2.901)	-0.010 {0.004} (-2.628)	-0.062 {0.060} (-1.863)
FSI	-0.004 {0.035} (-2.114)	-0.050 {0.000} (-3.833)	-0.062 {0.005} (-2.509)	-0.093 {0.005} (-1.991)	-0.018 {0.000} (-3.376)	-0.019 {0.020} (-2.001)	-0.068 {0.000} (-3.489)	-0.059 {0.030} (-2.210)	-0.041 {0.003} (-2.836)	-0.015 {0.005} (-2.575)
EMV	-0.023 {0.011} (-2.169)	-0.092 {0.000} (-3.626)	-0.034 {0.000} (-3.539)	-0.060 {0.000} (-3.301)	-0.047 {0.000} (-3.507)	-0.015 {0.010} (-2.296)	-0.079 {0.004} (-2.721)	-0.028 {0.030} (-2.033)	-0.057 {0.000} (-3.301)	-0.026 {0.000} (-3.567)
GDPPC						0.223 {0.343}	0.143 {0.305}	0.258 {0.438}	0.002 {0.152}	0.190 {0.301}
ΔGDP						0.349 {0.193}	0.061 {0.021}	0.073 {0.171}	0.021 {0.020}	0.201 {0.004}
ΔCPI						1.267 {0.052}	1.001 {0.067}	1.399 {0.049}	2.001 {0.011}	1.887 {0.015}
Adj. R ²	0.729	0.701	0.799	0.81	0.691	0.736	0.713	0.804	0.819	0.703

Lastly, in column 5 it is the financial institutions' stability of South Africa in response to geopolitical risk, economic policy uncertainty, financial stress, and equity market volatility tracker for infectious diseases. These variables explain 69% variation in the capital adequacy of South Africa and also hold negative and significant impact on it ($GR = -0.084$, $p = 0.061$, $EPU = -0.010$, $p = 0.095$, $FS = -0.018$, $p = 0.000$, $EMV = -0.047$, $p = 0.000$). The last column shows geopolitical risk, economic policy uncertainty, financial stress, and equity market volatility tracker for infectious diseases impact on financial institutions' stability of South Africa with macroeconomic control variables. The findings for independent variables are consistent with the findings of model 5. South African financial stability seems significant at a 10% confidence interval while estimating in response to geopolitical risk and global economic policy uncertainty. This might be attributed to the fact that global policy uncertainty does not count for data coming from South Africa in its construction. Among 21 countries, all other members are included except South Africa. The higher confidence interval of geopolitical risk impact on financial stability may be attributed to lack of tensions in the region of its destination. The unrest and tensions are mostly out of its region and specific to other blocks.

5. Discussion

The data analysis results in several findings from this empirical work. The basic relationship between the uncertainties and financial stability as governed by the economic theory is substantiated by the evidence of this work (Borch, 2015). Geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases as uncertain dimensions significantly affects the financial institutions' stability as suggested by the findings of this work. A similar sort of finding is referred to from the review of empirical evidence in the existing body of knowledge. Gilchrist et al. (2014) concluded the significant effect of different global level uncertain dimensions on different economies. The same significant effect of geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases is observed on financial stability for each country in the BRICS block as evident from this paper.

Geopolitical risk has negative consequences for financial stability as concluded by Gkillas et al. (2020). In this study, geopolitical also has a negative impact on financial institutions' stability. Aysan et al. (2019) found geopolitical risk as a driver of volatility in the financial system and the same sort of implications are evident from this work. The geopolitical tensions as measured by the risk index covering different regions spikes in the event of conflicts and wars. When there is conflict or tension between different countries, the risk index shows spikes and at the same time, financial system stability is declined. This is how geopolitical risk impacts financial institutions' stability.

Economic policy uncertainty and financial stress have empirically adverse effects on the soundness of the financial system (Phan et al., 2021; Smets, 2018) while analyzing financial institutions' stability as a constituent of the entire financial system, the same sort of findings are evident for BRICS region. The adverse effects of financial stress as evident from this research are also endorsed by the work of Apostolakis and Papadopoulos (2015). Economic policy uncertainty and financial stress level mostly depend on the fiscal and monetary policy decisions' uncertainty resulting from state government unpredictable decision making. If the authorities have ambiguity in making economic policy decisions and monetary policy decisions, then the indices of global economic policy uncertainty and financial stress have spikes. At the same time, there is observed negative change in the financial institution's stability.

The infectious disease also has harmful consequences for financial markets and financial institutions (Kilgo et al., 2018). This study is also consistent with the finding of these authors. The negative impact of infectious diseases on financial systems is evident from different scholarly works in recent times but it is limited to financial markets (Bai et al., 2020; Bouri et al., 2020). The findings of this work are endorsing a similar sort of impact on financial institutions' stability. Infectious diseases tracker shows changes when there is an outbreak of disease that is epidemic or pandemic in nature, then the result of this change is observed in the financial system and

associated markets at the same time. The rising uncertainty due to contagion diseases brings down the stability level of the financial system. So overall, the inference of this work is consistent with the developed literature and empirical shreds of evidence.

6. Conclusions

This work provides seminal insights from different strands of uncertainties and the financial system. The undermined constituent of financial system stability as financial institutions' stability is rigorously examined in this paper. The financial institutions' stability is being questioned and addressed in this work from the contextual setting of the BRICS block. The reviewed literature provided the base for choosing novel uncertain dimensions as predicting variables of the financial institutions' stability. The geopolitical risk, economic policy uncertainty, financial stress, and infectious diseases are found to have a negative and significant impact on the financial institutions' stability at the country level of BRICS economies. This finding is consistent with the empirical and theoretical literature.

This seminal work has great importance for policymakers, academicians, and practitioners. The financial institutions' stability literature is strengthened, and policymakers can plan to act for tackling uncertain drivers with a preemptive approach. Financial institutions can use risk management models and register to manage these uncertainties as these are now more evident in the dynamic environment. The ranking of events, which are more influential, can be done from the findings of this study. The financial institutions' frameworks for risk management must include an element of these uncertainties in their planning and implementation for control mechanisms. The practitioners can become more alert as the findings of this study endorse the impact of uncertainties on financial institutions' stability and they can prepare proactive strategies to stay ahead of happenings. The time series analysis is limited to a single economic block, and it must be extended to all strands of economies. More rigorous research techniques can be levered to endorse the generalization of the evidence. A series of robustness tests can be applied with alternate measures of variables for validation of this seminal work. Other uncertain dimensions at the global level can be benchmarked to examine the impact on financial institutions' stability in the upcoming studies.

Acknowledgements

We are grateful to our colleagues, defense panelists, and friends who have assisted us to develop this idea. We are also obliged to anonymous referees for their valuable contribution along with the editor of the journal.

Funding

The authors received no direct funding for this research.

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Declaration

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Citation information

Cite this article as: Is financial institutions' stability of BRICS block responsive to uncertain dimensions?, Rehan Aftab & Muhammad Naveed, *Cogent Business & Management* (2022), 9: 2010484.

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