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# MEASURING THE REGIME-SWITCHING BEHAVIOUR OF UNEMPLOYMENT THROUGH THE LENS OF GLOBAL UNCERTAINTIES: EVIDENCE FROM THE SELECT BRICS ECONOMIES

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## ABSTRACT

This study considers quarterly closing data of unemployment rates and the world uncertainty index from the select BRICS economies during the study period from Q1 1994 to Q4 2025, with 128 sample observations, to study the dynamic relationship between the global uncertainties and the unemployment rates from the BRICS economies along with the regime-switching behaviour of unemployment rates as a result of the world uncertainty index. The JB test confirms the non-normality of the dataset, whereas the ADF test confirms stationarity of the dataset at the first difference. Moreover, the quantile regression model approves the dynamic non-linear relationship between unemployment and WUI. Furthermore, the MRS model discloses that at times of high uncertainty, unemployment sensitivity increases most in South Africa and India, followed by China and Brazil. Although Russia demonstrated an inverse scenario, indicating presence of strong strategic policies can play a crucial role in mitigating the adversities of global uncertainties.

**Keywords:** Unemployment, Global Uncertainties, Quantile Regression, Markov, BRICS

## 1. INTRODUCTION

The world economy is now more susceptible to a variety of risks that cut across national borders and alter macroeconomic results. The dynamics of economic growth and labour markets have changed significantly over the past 20 years due to frequent economic crises, geopolitical conflicts, pandemics, financial market volatility, climate-related calamities, and policy unpredictability (https://www.indiabudget.gov.in/economicsurvey/doc/echapter.pdf). These multifaceted uncertainties, in contrast to conventional business cycle swings, produce long-lasting shocks that affect investment choices, manufacturing processes, global trade, and job creation. As a result, it has become crucial for economists, decision-makers, and international organisations to comprehend the connection between unemployment and global uncertainty **(Islam, 2025)**.

Unemployment is one of the most crucial indices of macroeconomic performance and social wellbeing. Unemployment has far-reaching economic and social repercussions in addition to being an underutilization of labour resources **(Sengenberger, 2011)**. These include decreased household income, growing income inequality, decreased consumer demand, increased poverty, declining mental health, and increased political instability. Thus, governments around the world now prioritise maintaining steady employment, especially in emerging countries where huge labour forces and demographic shifts present extra policy concerns. However, exogenous shocks that originate outside of domestic economic fundamentals are increasingly influencing labour markets, making employment outcomes more vulnerable to global uncertainty than in the past **(Miklian and Hoelscher, 2021)**.

The term global uncertainties refer to a wide range of dangers that result from erratic international occurrences that interfere with economic expectations and decision-making. Geopolitical tensions, economic policy uncertainty, risks associated with climate change, financial market volatility, trade disputes, fluctuations in energy prices, public health emergencies, and technological disruptions are some of these concerns. Labour markets are impacted by these uncertainties through a variety of

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transmission mechanisms. Increased uncertainty deters private investment since businesses put off hiring and capital expenditures until the state of the economy is more certain. Additionally, companies frequently cut back on output, postpone plans for growth, and implement cost-cutting strategies that frequently include hiring freezes or labour cutbacks (http://indiabudget.gov.in/budget2019-20/economicsurvey/doc/vol1chapter/echap06_vol1.pdf). Aggregate demand is suppressed concurrently with a decline in consumer confidence, which further impedes the creation of jobs. Global uncertainties also have a negative impact on supply chains, foreign direct investment, and international trade, all of which are important employment drivers **(Akpilic, 2026)**. The global uncertainties during the study period that have a significant impact on the BRICS economies are listed below.

| Year | Major Global Uncertainty/Event | Source | Year | Major Global Uncertainty/Event | Source |
|---|---|---|---|---|---|
| 1994 | Mexican Peso Crisis | International Monetary Fund – World Economic Outlook | 2010 | European Sovereign Debt Crisis | European sovereign debt crisis |
| 1995 | Recovery from Mexican Crisis | International Monetary Fund – World Economic Outlook | 2011 | Eurozone Debt Crisis and Arab Spring | Arab Spring; International Monetary Fund |
| 1996 | Emerging Asian financial vulnerabilities | World Bank – Global Economic Prospects | 2012 | Eurozone instability | Organisation for Economic Co-operation and Development – Economic Outlook |
| 1997 | Asian Financial Crisis | Asian Financial Crisis; International Monetary Fund | 2013 | U.S. Federal Reserve Taper Tantrum | Federal reserve |
| 1998 | Russian Financial Crisis and LTCM Collapse | Russian financial crisis; International Monetary Fund | 2014 | Russia–Ukraine (Crimea) conflict and oil price collapse | Annexation of Crimea by the Russian Federation |
| 1999 | Brazilian Currency Crisis | 1999 Brazilian currency crisis; International Monetary Fund | 2015 | Chinese stock market crash | 2015–2016 Chinese stock market turbulence |
| 2000 | Dot-com Bubble | Dot-com bubble | 2016 | Brexit referendum and U.S. Presidential Election | Brexit |
| 2001 | Dot-com Crash and September 11 Attacks | September 11 attacks; International Monetary Fund | 2017 | Rising geopolitical tensions | Economist Intelligence Unit Country Reports |
| 2002 | Enron and WorldCom scandals | Enron scandal; WorldCom accounting scandal | 2018 | U.S.–China Trade War | China–United States trade war |
| 2003 | Iraq War and SARS outbreak | CDC SARS Response Timeline | 2019 | Escalation of trade tensions | World Trade Organization – World Trade Report |
| 2004 | Rising oil prices | International Energy Agency | 2020 | COVID-19 Pandemic | World Health Organisation |

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| | | | | | |
|---|---|---|---|---|---|
| 2005 | Hurricane Katrina and energy price volatility | Hurricane Katrina; International Energy Agency | 2021 | Supply-chain crisis and inflation | World Bank – Global Economic Prospects |
| 2006 | Middle East geopolitical tensions | International Energy Agency | 2022 | Russia–Ukraine War and global energy crisis | Russian invasion of Ukraine; International Energy Agency |
| 2007 | U.S. Subprime Mortgage Crisis | Subprime mortgage crisis | 2023 | Global inflation, banking-sector stress and geopolitical tensions | International Monetary Fund – World Economic Outlook |
| 2008 | Global Financial Crisis | Global financial crisis | 2024 | Red Sea shipping disruptions, geopolitical conflicts and high interest rates | Red Sea crisis; World Bank |
| 2009 | Global recession | International Monetary Fund – World Economic Outlook | 2025 | Continued geopolitical fragmentation, technological rivalry and trade policy uncertainty | International Monetary Fund – World Economic Outlook (2025); Economist Intelligence Unit Country Reports |

**(Authors' own tabulation)**

Examining the link in the context of the BRICS economies, namely Brazil, Russia, India, China, and South Africa, is especially pertinent. When taken as a whole, these economies contribute significantly to the world's labour force, natural resources, global output, and population. Even though they are all categorised as rising economies, their economic structures, institutional quality, labour market features, industrial makeup, and policy frameworks vary greatly. Brazil and Russia continue to rely heavily on commodity exports, rendering them especially susceptible to changes in global commodity prices and geopolitical developments, whereas China and India have very diverse industrial and service sectors. Both structural unemployment and social inequality persist in South Africa. These structural variations suggest that unemployment may be impacted by global uncertainties differently in each of the BRICS economies, which calls for a comparative empirical study.

## 2. UNDERPINNINGS FROM PRIOR STUDIES

A significant body of available literature has been reviewed minutely both from the national and international context, and the summary of the findings is outlined below:

**Singh et al. (2026)** examine a number of BRICS labour market factors, including employment, unemployment, and labour force participation rates. Additionally, utilising the available statistical data, this article provides a quantitative evaluation of the state of the labour market. The study's data were collected from national statistics and the World Bank database maintained by international entities. The study indicates that India's labour market differs from other BRICS countries due to its demographic profile, substantial informal employment, skill development issues, regulatory environment, and distinct policy approach.

**Bhatia and Tuteja (2025)** examine the effects of several forms of uncertainty on the export demand functions of Brazil, Russia, India, China, and South Africa from August 2005 to February 2023. These include economic policy, financial, geopolitical, health, and trade policy uncertainty. They demonstrate that increasing uncertainty has a substantial effect on exports using non-linear panel autoregressive distributed lag estimation. The findings indicate that while the COVID-19 pandemic

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only had a short-term impact on exports, events that intensified financial stress, such as the global financial crisis, and those that increased geopolitical tensions, such as the conflict between Russia and Ukraine, had a long-term dampening effect.

**Thangaraju et al. (2025)** examine different facets of the BRICS labour market, including employment, unemployment, and labour force participation rates. Additionally, this report provides a quantitative evaluation of the state of the labour market based on currently available statistical data. The study's data were collected from national statistics and the World Bank database maintained by international entities. The study indicates that India's labour market differs from other BRICS countries due to its demographic profile, substantial informal employment, skill development issues, regulatory environment, and distinct policy approach.

**Kingsly, M. K. (2024)** is of the view that in a time of intense rivalry and export concentration, countries frequently rely significantly on a limited number of important markets. As a result, significant economic loss may result from any drop in demand or trade disputes with industrialised nations. In light of this, the BRICS nations' enormous trade potential may make them important allies for less-developed countries (LDCs). The BRICS nations have already started working with LDCs on foreign aid projects and economic cooperation as members of the South-South group. Together, they are the main source of aid from countries that are not members of the Development Assistance Committee (DAC). The BRICS are now seen as a competitive option to the OECD-DAC (Organisation for Economic Co-operation and Development-Development Assistance Committee) due to their increasing importance.

The impact of certain uncertainty metrics, such as economic policy uncertainty, geopolitical risk, financial uncertainty, or climatic uncertainty, on macroeconomic variables, such as investment, economic growth, stock markets, and inflation, has been thoroughly examined in the empirical literature to date. However, there are still very few studies that expressly look at unemployment from the larger viewpoint of various global uncertainties, especially for the BRICS economies. The majority of earlier research ignores the diverse reactions of labour markets in developing countries by concentrating on advanced economies or examining single-country experiences. Additionally, few studies take into account the multifaceted nature of uncertainty from many backgrounds and their cumulative effects on employment dynamics, but they neglect to examine how global uncertainties affect the unemployment rate. This gap restricts our comprehension of how shocks to global uncertainty interact to affect labour market dynamics.

On the basis of the lacunas in the existing studies, the following objectives could be finalised. First, to study the dynamic relationship between the select global uncertainties and the unemployment rates from the BRICS economies. Second, to study the regime-switching behaviour between the global uncertainties and the unemployment rates from the select BRICS economies.

## 3. RESEARCH METHODOLOGY

This study considers quarterly closing return data of the select world uncertainty index (WUI) and the unemployment rates from the BRICS economies, namely Brazil, Russia, India, China, and South Africa, during the study period from Q1 1994 to Q4 2025, with 128 sample observations. The data of the select WUI are collected from the database of the World Uncertainty Index developed by **Ahir et al. (2022)** available at https://worlduncertaintyindex.com/data/, and the data of the unemployment rate are collected from the database of the World Bank available at https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS.

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In this context, it is noteworthy to mention that the data on the unemployment rate is available in annual frequency for all the select countries in the present study. So, the author has decided to convert the available annual frequency to quarterly data to match the frequency of the other variable considered in this study for all the countries. It is also pertinent to mention that the procedure to convert low-frequency data (annual here) to high-frequency data (quarterly here) was first discussed by **Lisman and Sandee (1964)** using a weighted average method from which weighted coefficients can be obtained. However, **Chow and Lin (1971)** contradicted such a technique and expressed the opinion of using the procedure of interpolation and extrapolation. However, later, **Dagum and Cholette (2006)** used the procedure of benchmarking and reconciliation and formulated a methodical approach to convert low-frequency data to high-frequency data. In a similar way, **Denton (1971)** also developed a methodology to create a monthly or quarterly series given a set of annual figures. Again, **Ginsburgh (1973)** states how quarterly figures can be generated from related annual figures by maintaining consistency and without harming the spirit of the annual data.

The above methods provide a clear viewpoint that low-frequency data can be converted into high-frequency data to match the necessity of the data point or frequencies when multiple series of data are used in a study. But it is significant to note that some methods ignore the requirement of keeping the converted high-frequency data in line with the low-frequency data.

**Sax and Steiner (2013)** developed a sophisticated systematic approach that considers converting low-frequency data to high-frequency data by applying a temporal disaggregation process where either the summation, the mean, the beginning or the closing value of the subsequent high-frequency series is absolutely consistent with the low-frequency series. The system devised by **Sax and Steiner (2013)** uses the Denton, Denton-Cholette, Chow-Lin, Fernandez, and Litterman standard techniques for temporal disaggregation. The movement preservation is the main focus of Denton-Cholette, which has been used as a key tool to convert annual data into quarterly data in the present study.

The Denton-Cholette technique of conversion is available under the tempdisagg package developed by **Sax and Steiner (2013)** in RStudio software.

In official statistics, temporal disaggregation techniques are frequently employed. For instance, disaggregation techniques are used to calculate quarterly GDP figures in France, Italy, and other European nations **(Sax and Steiner, 2013)**.

The author has consciously used the quarterly data for several reasons. First, quarterly data is free from the noise factor, which significantly affects several macroeconomic indicators, like WUI in our case, which is observed in daily or monthly data. Since this study considers measuring the dynamic relationship and regime-switching behaviour, quarterly data does not affect the spirit of the objective in any way. However, one might consider daily or monthly data if the objective serves the motive of estimating daily volatilities and movements and so on **(Pham, 2020)**. Second, the high-frequency daily or monthly data is vulnerable to biases connected with the bid-ask factor. Hence, this problem is also solved in the context of quarterly data usage **(Pham, 2020)**.

To address the objectives of the study, diverse econometric approaches, namely the ADF unit root test, quantile regression model, Markov regime-switching model, and descriptive tests, are used.

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## 4. DATA ANALYSIS AND INTERPRETATIONS

### 4.1 Descriptive Statistics

| Countries | Brazil | | Russia | | India | | China | | South Africa | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameters/ Variables | WUI | Unemployment Rate | WUI | Unemployment Rate | WUI | Unemployment Rate | WUI | Unemployment Rate | WUI | Unemployment Rate |
| Mean | 0.1 | 2.37 | 0.07 | 1.73 | 0.04 | 1.78 | 0.04 | 1.06 | 0.14 | 6.36 |
| Median | 0.08 | 2.38 | 0.07 | 1.61 | 0.03 | 1.9 | 0.03 | 1.13 | 0.11 | 6.06 |
| Maximum | 0.49 | 3.53 | 0.21 | 3.38 | 0.14 | 2.02 | 0.15 | 1.27 | 0.54 | 8.67 |
| Minimum | 0 | 1.46 | 0 | 0.52 | 0 | 1.03 | 0 | 0.72 | 0 | 5.56 |
| Std. Dev. | 0.09 | 0.53 | 0.04 | 0.69 | 0.03 | 0.28 | 0.04 | 0.15 | 0.12 | 0.92 |
| Skewness | 1.87 | 0.23 | 0.68 | 0.57 | 1.14 | -2.04 | 1.1 | -1.06 | 1 | 1.16 |
| Kurtosis | 7.56 | 2.13 | 3.51 | 2.99 | 4.12 | 5.48 | 3.68 | 2.61 | 3.45 | 2.99 |
| Jarque-Bera | 185.54 | 5.12 | 11.38 | 7.01 | 34.22 | 121.44 | 28.51 | 24.78 | 22.46 | 28.79 |
| Probability | 0.00* | 0.08*** | 0.00* | 0.03** | 0.00* | 0.00* | 0.00* | 0.00* | 0.00* | 0.00* |

**(* indicates significance at 1%, ** indicates significance at 5%, *** indicates significance at 10%)**

**Source: Author's own computation using EViews 12.0 Package**

The above table provides the descriptive statistics of the select variables, namely the WUI from the BRICS nations along with the corresponding unemployment rates during the study period from Q1 1994 to Q4 2025 with 128 sample observations. On the basis of the p-value of the Jarque-Bera test, it is observed that all the WUI and the unemployment rates are non-normal in nature, thereby directing the author to conduct a non-linear relationship analysis.

### 4.2 ADF Unit Root Test

| Countries | Variables/Parameters | At level | | At first difference | |
|---|---|---|---|---|---|
| | | t-stat | p-value | t-stat | p-value |
| Brazil | WUI | -4.66 | 0.0013* | -9.07 | 0.00* |
| | Unemployment Rate | -3.43 | 0.053** | -4.28 | 0.0047* |
| Russia | WUI | -4.51 | 0.0022* | -12.78 | 0.00* |
| | Unemployment Rate | -3.53 | 0.0407** | -4.43 | 0.0029* |
| India | WUI | -4.49 | 0.0023** | -12.20 | 0.00* |
| | Unemployment Rate | 0.27 | 1.00 | -4.18 | 0.0065* |
| China | WUI | -4.26 | 0.0049* | -11.59 | 0.00* |
| | Unemployment Rate | -1.54 | 0.81 | -4.21 | 0.0058* |
| South Africa | WUI | -3.28 | 0.0749*** | -7.70 | 0.00* |
| | Unemployment Rate | -1.43 | 0.85 | -4.32 | 0.0042* |

**(* indicates significance at 1%, ** indicates significance at 5%, *** indicates significance at 10%)**

**Source: Author's own computation using E-views 12.0 Package**

The above table highlights the outcomes of the unit root test of the select WUI and the unemployment rate from the BRICS economies during the study period. It is observed that, except for the unemployment rate of India, China, and South Africa, all other variables are found to have significant p-values confirming the non-existence of a unit root at the level. However, all the variables for all the select BRICS economies are found to have significant p-values at the first difference, indicating the non-existence of a unit root. Following the non-normality of the dataset and mixed order of stationarity, the author conducted a quantile regression model.

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### 4.3 Quantile Regression (QREG) Model

| Countries | Dependent Variable | Independent Variables | Parameters | Q 0.25 | Q 0.50 | Q 0.75 |
|---|---|---|---|---|---|---|
| **Brazil** | **Unemployment Rate** | **WUI** | **Coefficient** | 12.12 | 17.47 | 27.17 |
| | | | **p-value** | 0.00* | 0.00* | 0.00* |
| **Russia** | | | **Coefficient** | 29.61 | 15.71 | 29.61 |
| | | | **p-value** | 0.00* | 0.00* | 0.00* |
| **India** | | | **Coefficient** | 19.34 | 30.84 | 51.61 |
| | | | **p-value** | 0.00* | 0.00* | 0.00* |
| **China** | | | **Coefficient** | 11.78 | 16.40 | 26.15 |
| | | | **p-value** | 0.00* | 0.00* | 0.00* |
| **South Africa** | | | **Coefficient** | 20.34 | 27.84 | 48.37 |
| | | | **p-value** | 0.00* | 0.00* | 0.00* |

**(* indicates significance at 1%)**

**Source: Author's own computation using E-views 12.0 Package**

The equation of the above quantile regression model can be framed as:

$$Y_i = \mu\,(X_i) + \sigma\,(X_i)\,\varepsilon_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

$$\text{Unemployment Rate}_{128} = \mu\,(\text{WUI}_{128}) + \sigma\,(\text{X}_\text{i})\,\varepsilon_i \quad \ldots\ldots(2)$$

The above table denotes the outcomes of the quantile regression model between the select unemployment rates and the WUI from the BRICS nations, namely Brazil, Russia, India, China, and South Africa. In contrast to ordinary least squares regression, which assesses the average influence of the explanatory variable, quantile regression examines the effects of global uncertainty at various points along the unemployment distribution. The findings show that the coefficients of the World Uncertainty Index (WUI) are positive and statistically significant at the 1% level across all quantiles and countries, demonstrating that rising global uncertainty consistently leads to an increase in unemployment.

In Brazil, as a result of WUI, the coefficient of the unemployment rate rises from 12.12 at the 25th quantile to 17.47 at the 50th, and further to 27.17 at the 75th quantile. This indicates that while global uncertainty impacts unemployment across the spectrum, its influence intensifies as unemployment increases from low to medium levels and further rises to higher unemployment rates. The rising coefficients throughout the quantiles suggest that the Brazilian labour market increasingly faces vulnerabilities from global uncertainty as unemployment escalates. In times of already high unemployment, shocks related to uncertainty result in a disproportionately negative impact on employment, indicating that businesses are more inclined to delay investment and hiring choices, while households tend to cut back on consumption amidst increased economic uncertainty (https://www.ilo.org/sites/default/files/2025-01/WESO25_Trends_Report_EN.pdf). As a result, external uncertainty intensifies pre-existing weaknesses within the labour market, complicating efforts for economic recovery. These results underscore the importance of implementing counter-cyclical fiscal and monetary policies, as well as labour market support initiatives and strategies to boost business confidence during times of elevated global uncertainty. Such measures can aid in lessening the impact of global uncertainty shocks that lead to higher unemployment, especially when the labour market is already challenged. Again, for Russia, the estimated coefficients are 29.61, 15.71, and 29.61 at the $25^{th}$, $50^{th}$, and $75^{th}$ quantiles, respectively. These results show that the effect of global uncertainty is significant across the unemployment distribution but follows a non-linear pattern. The

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smaller coefficient at the median suggests the labour market is relatively resilient under normal conditions, while the impact of uncertainty is much stronger during periods of both relatively low and high unemployment. It can be suggested that instead of depending solely on broad-based interventions during economic stress, policymakers should implement targeted labour market and macroeconomic stabilisation measures. Strengthening investment confidence, diversifying economic activity beyond commodity dependence, and providing timely employment support programs can help mitigate the adverse effects of global uncertainty on Russia's labour market, especially during periods of heightened vulnerability. In the context of India, the estimated coefficients increase steadily from 19.34 at the $25^{th}$ quantile to 30.84 at the median and 51.61 at the $75^{th}$ quantile. This consistent rise shows that the adverse impact of global uncertainty intensifies significantly as unemployment increases. The notably large coefficient at the upper quantile indicates that uncertainty shocks have the greatest effect during periods of elevated unemployment, suggesting that India's labour market is highly sensitive to global uncertainty under stressed economic conditions. This is so because India is highly integrated with the global economy through international trade, foreign direct investment, portfolio capital flows, and service exports, particularly in information technology, business process outsourcing (BPO), pharmaceuticals, textiles, and automobiles. During periods of heightened global uncertainty, weaker external demand and reduced cross-border investment lead to lower production and hiring, resulting in higher unemployment **(Gupta, 2024)**.

Similarly, China shows positive and significant coefficients of 11.78, 16.40, and 26.15 across the three quantiles. Although these effects are smaller than those observed in other BRICS economies, the rising coefficients indicate that global uncertainty contributes to higher unemployment. This suggests that while China's labour market is relatively more resilient to global uncertainty, higher unemployment increases its vulnerability to external shocks.

For South Africa, the coefficients increase substantially from 20.34 at the lower quantile to 27.84 at the median and 48.37 at the upper quantile. These results suggest that the adverse effects of global uncertainty become significantly stronger during periods of high unemployment. This underscores the structural weaknesses of South Africa's labour market, where external uncertainty intensifies existing unemployment challenges.

All things considered, the quantile regression results offer compelling proof of the varied impacts of global uncertainty on unemployment in the BRICS economies. Global uncertainty consistently increases unemployment, as confirmed by the positive and statistically significant coefficients at all quantiles; however, the effect's magnitude varies depending on the amount of unemployment. There is an unequal relationship between uncertainty and labour market results, as evidenced by the rising coefficients for Brazil, India, China, and South Africa, which show that the impact of global uncertainty is significantly greater when unemployment is already high.

### 4.4 Markov regime-switching (MRS) model

#### 4.4.1 Markov Switching Regression

A statistical time-series model that permits the underlying dynamics of data to shift between unobserved states or regimes is called a Markov Regime-Switching model. It is very useful for simulating sudden structural changes like economic booms and busts since transitions between regimes are controlled by probabilistic rules (https://www.aptech.com/blog/introduction-to-markov-switching-models/).

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| Country | Regime | Dependent Variable | Coefficient | Prob. |
|---|---|---|---|---|
| **Brazil** | **1** | **Unemployment Rate** | 10.25 | 0.00* |
| | **2** | | 27.14 | 0.00* |
| **Russia** | **1** | | 40.40 | 0.00* |
| | **2** | | 13.59 | 0.00* |
| **India** | **1** | | 22.15 | 0.00* |
| | **2** | | 56.06 | 0.00* |
| **China** | **1** | | 13.59 | 0.00* |
| | **2** | | 29.91 | 0.00* |
| **South Africa** | **1** | | 23.15 | 0.00* |
| | **2** | | 69.00 | 0.00* |

**Source: Author's own computation using EViews 12.0 Package**

The above table denotes the result of the MRS model between the unemployment rate and the WUI among the select BRICS nations during the study period Q1 1994 to Q4 2025 across two economic regimes, where one regime signifies a high-volatility state and the other regime signifies a low-volatility state. For every BRICS economy, the calculated coefficients for both regimes are positive and statistically significant at the 1% level. This suggests that, regardless of the current regime, a rise in global uncertainty considerably increases unemployment. The effect in terms of amplitude, however, varies significantly between nations and regimes, indicating different labour market reactions in both stable and unstable economic times.

The discussion shall now be extended to country-specific scenarios. The global uncertainty coefficient for Brazil falls from 27.14 in Regime 1 to 10.25 in Regime 2. In both regimes, more global uncertainty leads to higher unemployment, according to the positive and statistically significant coefficients. However, the significantly higher value in Regime 1 indicates that at times of increased economic uncertainty, Brazil's labour market becomes far more vulnerable. Brazil demonstrates reliance on commodity exports, erratic capital flows, and comparatively cyclical labour market conditions, all of which exacerbate job losses during global shocks, which may be the cause of such a scenario **(Dullien, 2010)**. However, Russia shows a different trend. While both are still statistically significant, the coefficient decreases from 40.40 in Regime 1 to 13.59 in Regime 2. This suggests that during the first regime, unemployment is more affected by global uncertainty than it is during the second regime. The labour market is protected from more job losses during times of crisis by significant government intervention, support for the energy sector, and calculated fiscal measures. As a result, even while uncertainty keeps rising unemployment, its marginal impact decreases during the crisis. In the context of India, a significant increase in the sensitivity of unemployment to global uncertainty during the high-volatility regime, with values of 22.15 in Regime 1 and 56.06 in Regime 2, can be observed. This result implies that during times of high uncertainty, India's labour market is especially vulnerable to external shocks. Unemployment in the high-volatility regime is probably made worse by the predominance of informal employment, reliance on export-oriented businesses, interruptions in global supply networks, and decreased investment during uncertain times. Again, with coefficients rising from 13.59 in Regime 1 to 29.91 in Regime 2, China likewise exhibits a more robust reaction in the high-volatility regime. Strong industrial policy and government intervention assist China's economy, yet during times of crisis, global uncertainty still has a much greater impact. This could be a result of decreased global demand, manufacturing export disruptions, supply-chain disruptions, and lower private investment, all of which raise unemployment as uncertainty increases. In the context of South Africa, the biggest regime disparity can be observed. The results shows an extraordinarily significant impact of global uncertainty during times of economic distress, rising sharply from 23.15 in Regime 1

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to 69.00 in Regime 2. This outcome illustrates the underlying weaknesses of South Africa's labour market as a result of global uncertainties, such as the country's ongoing high unemployment rate, reliance on commodity exports, restricted industry diversification, and socioeconomic disparities. As an outcome, during times of high volatility, external uncertainty shocks result in disproportionately greater rises in unemployment (https://thestar.co.za/business-report/opinion/2025-07-06-the-anatomy-of-decline-unemployment-and-south-africas-structural-crisis/).

The findings indicate that at times of high uncertainty, unemployment sensitivity increases most in South Africa and India, followed by China and Brazil. Although Russia demonstrated an inverse scenario, indicating presence of strong strategic policies can play a crucial role in mitigating the adversities of global uncertainties.

### 4.4.2 Markov Switching Transition Probabilities

| Country | Regime | 1 | 2 |
|---|---|---|---|
| **Brazil** | **1** | 0.96 | 0.04 |
| | **2** | 0.02 | 0.98 |
| **Russia** | **1** | 0.98 | 0.02 |
| | **2** | 0.01 | 0.99 |
| **India** | **1** | 0.97 | 0.03 |
| | **2** | 0.04 | 0.96 |
| **China** | **1** | 0.96 | 0.04 |
| | **2** | 0.06 | 0.94 |
| **South Africa** | **1** | 0.95 | 0.05 |
| | **2** | 0.04 | 0.96 |

**Source: Author's own computation using EViews 12.0 Package**

The likelihood that the unemployment process stays in the same regime or changes to a different regime as an effect of the WUI from one period to the next is displayed by the Markov Switching Transition Probability matrix. The probabilities of staying in the current regime are represented by the diagonal elements $P_{11}$ and $P_{22}$, whereas the probabilities of changing regimes are shown by the off-diagonal elements $P_{12}$ and $P_{21}$. Strong regime persistence and few transitions are indicated by high diagonal probabilities.

The two-regime processes are very persistent in Brazil. There is a 0.96 chance of staying in regime 1 and a mere 0.04 chance of moving to regime 2. Similarly, the probability of the economy returning to regime 1 is merely 0.02, and once it reaches regime 2, it stays there with a probability of 0.98. These findings imply that both regimes are very stable, with regime 2 being marginally more enduring. As a result, periods of low or high unemployment sensitivity to global uncertainty typically persist for a few quarters before shifting. It is also noteworthy to mention that of the BRICS economies, Russia has the greatest level of persistence. There is a 0.98 chance of staying in regime 1 and a 0.99 chance of staying in regime 2. The very low transition probabilities of 0.02 and 0.01 between the two regimes show how infrequently regime shifts take place. This implies that there are extended periods of stability in the Russian labour market under each regime, indicating a considerable structural persistence in the relationship between unemployment and global uncertainty. Likewise, India also demonstrates great regime persistence. There is a 0.97 chance of staying in regime 1 and a 0.96 chance of staying in regime 2. The comparatively low switching probabilities of 0.03 and 0.04 suggest that the economy is likely to stay in either regime for a considerable amount of time. Regime 1 is marginally more persistent, suggesting that the lower-impact condition is more common and lasts longer than the

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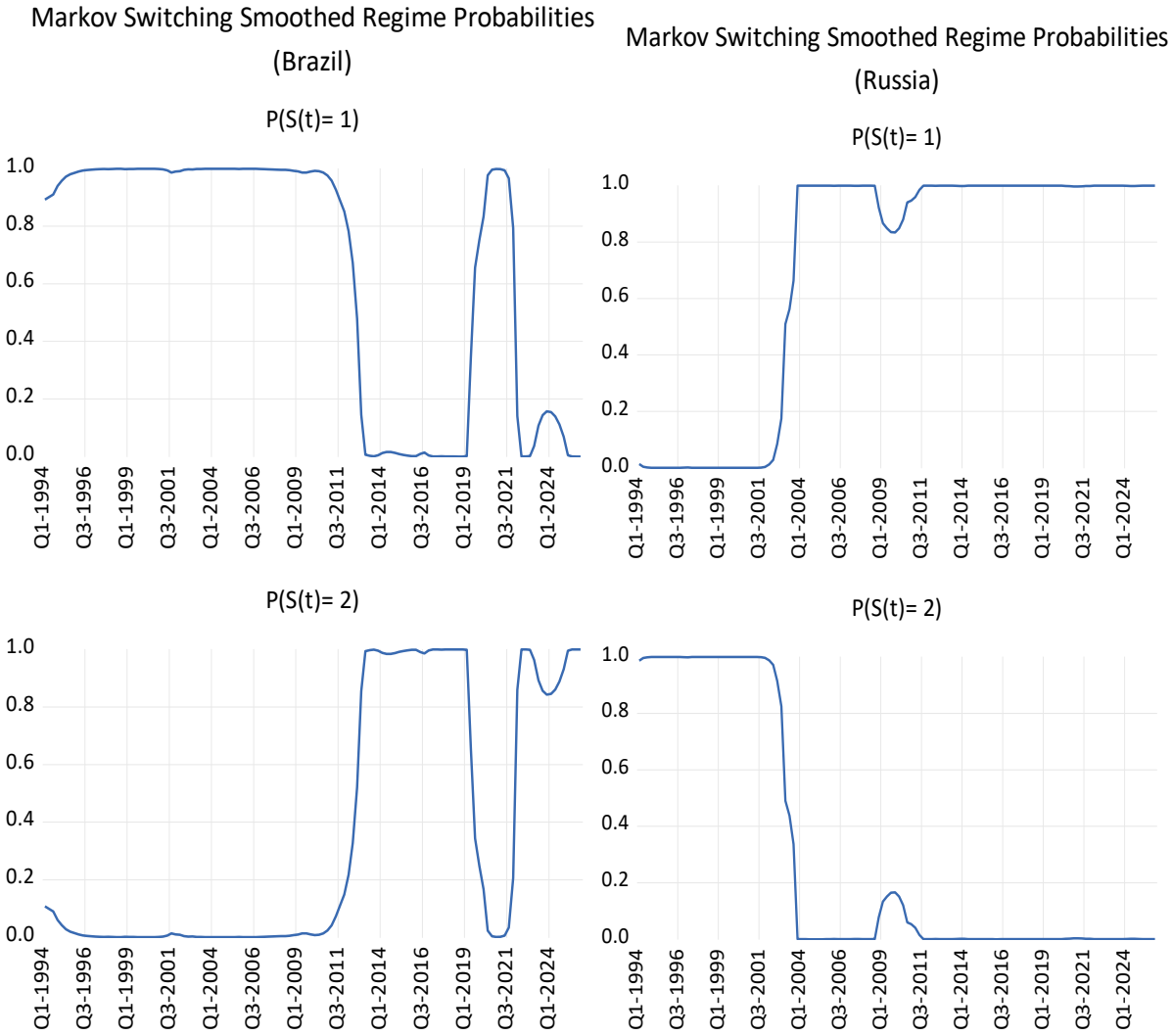
high-impact state. Despite having the highest transition probability of the five nations, China has strong persistence in both regimes. There is a 0.96 chance of staying in regime 1 and a 0.94 chance of staying in regime 2. Compared to the other BRICS economies, the likelihood of switching from regime 2 to regime 1, i.e., 0.06, is significantly higher, indicating that China's labour market adapts to shifting economic conditions more swiftly. As a result, China experiences regime changes more frequently than the other nations. Again, for South Africa, the probability of remaining in regime 1 is 0.95, while the probability of remaining in regime 2 is 0.96. The low transition probabilities are 0.05 and 0.04, indicating that both regimes are relatively stable over time. The slightly higher persistence of regime 2 suggests that once unemployment enters the high-impact state, it tends to remain there for a prolonged period before returning to the lower-impact regime. The regime-switching probabilities are graphically demonstrated below:



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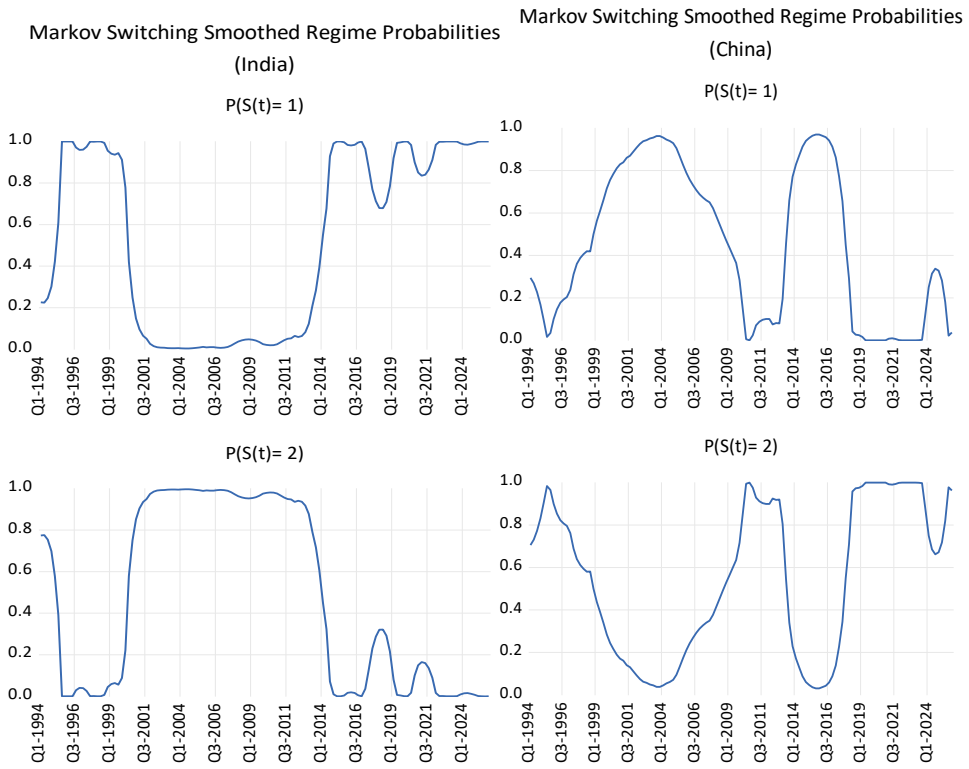


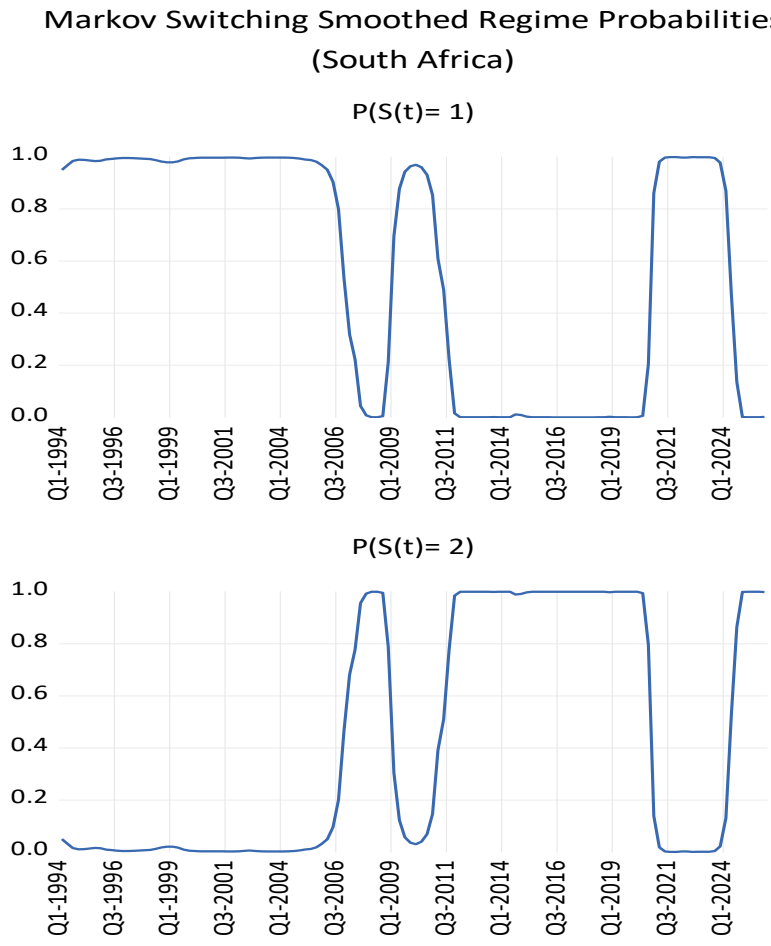


**Source: Author's own computation using EViews 12.0 Package**

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The above results suggest that regime changes are comparatively rare since the impacts of global uncertainty on unemployment are long-lasting, which is lasting several quarters. Russia is the most persistent of the five nations, suggesting the most stable regime structure. While China is the most likely to swap regimes, showing comparatively more flexibility in its labour market dynamics, strong but marginally less persistent than Russia, Brazil, India, and South Africa hold an intermediate position.

## 5. NOVELTY OF THE STUDY

The present study makes numerous significant contributions to the body of current literature. First, by using many global uncertainty indicators rather than depending on a single source of uncertainty, it expands the traditional analysis of unemployment. Second, it concentrates on BRICS economies, a collection of developing nations that are becoming more and more important to the world economy but are still underrepresented in empirical labour market studies. Third, the study provides important insights into the diverse effects of uncertainty on employment by comparing data across nations with different institutional and economic features. Finally, the findings bear major policy implications by helping governments design labour market and macroeconomic policies that strengthen resilience against external shocks, promote employment stability, and support sustainable economic development during periods of heightened volatility.

It is now more crucial than ever to comprehend the connection between global uncertainties and unemployment given the rising interdependence of national economies and the frequency of global disruptions. In addition to adding value to the scholarly literature, determining the degree to which external uncertainties affect labour market outcomes will give policymakers evidence-based advice on how to protect jobs and promote equitable growth in a world that is becoming more unpredictable.

## CONCLUDING OBSERVATIONS AND POLICY IMPLICATIONS

Using a two-state Markov Regime Switching (MRS) model, this study investigated the switching behaviour of unemployment under the impact of global uncertainty across the chosen BRICS economies. The MRS framework recognises the existence of multiple labour market regimes and the potential for transitions between low- and high-unemployment states, in contrast to traditional linear models that assume a consistent link between uncertainty and labour market outcomes. The empirical results verify that the relationship between unemployment and global uncertainty is intrinsically non-linear and regime-dependent, suggesting that labour markets react differently based on the state of the economy. The extent and persistence of unemployment regimes exhibit notable cross-country variability, according to the results. Global uncertainty has a statistically significant impact on unemployment in all of the chosen BRICS economies, but it is much more pronounced in Brazil, India, China, and South Africa during periods of high volatility, indicating that unfavourable global shocks exacerbate pre-existing labour market vulnerabilities. During times of economic distress, these economies are more vulnerable to uncertainty due to structural rigidities, slowdowns in investment, a decline in business confidence, and weakening labour demand. Russia, on the other hand, shows a comparatively stronger reaction in the low-volatility regime, suggesting that because of its distinct economic structure, reliance on commodity markets, and policy actions, uncertainty affects labour market dynamics differently. Further, the calculated transition probabilities also show considerable regime persistence among the BRICS economies, indicating that an economy is likely to be in a low- or high-volatility state for an extended amount of time once it enters that state. This persistence shows how difficult it is for governments to reverse unfavourable labour market circumstances following times of increased international uncertainty. The significance of prompt macroeconomic interventions

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is reinforced by the comparatively low probability of regime transition, which suggests that external shocks may have long-lasting consequences on employment dynamics.

The results highlight the necessity of regime-specific labour market strategies as opposed to standard stabilising measures from a policy standpoint. Governments should give priority to expansionary fiscal policies, employment-generation initiatives, labour market flexibility, social protection systems, and targeted support for industries most susceptible to global uncertainty during periods of high volatility. Adverse volatility regimes can be less persistent when institutional resilience is strengthened, economic diversity is encouraged, private investment is encouraged, and policy legitimacy is increased. Coordinated policy initiatives among the BRICS economies may also lessen the spread of shocks to global uncertainty and increase labour market resilience given the growing interconnection of the world economy.

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