Relationships and Dynamic Feedback Effects between Financial Market Risks and Macroeconomic Stability Variables in Jordan

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Received: 22/12/2023
Revised: 28/1/2024
Accepted: 2/4/2024
Published: 1/1/2025

Citation: Abu Roman, N. . (2025). Relationships and Dynamic Feedback Effects between Financial Market Risks and Macroeconomic Stability Variables in Jordan. *Jordan Journal of Economic Sciences*, *12*(1), 1–21. https://doi.org/10.35516/jjes.v12i1.2122

Abstract

Objectives: This study examines the complex relationship between financial market risk (Financial Market Risk and three indicators of macroeconomic stability—the unemployment rate, headline inflation, and breakeven inflation using data ranging from January 2023 to December 2022.

Methods: Using an asymptotic vector autoregression (VAR) optimised by the Schwartz information criterion (SIC) and a Maximum likelihood two-state Markov switching process, this study investigates the dynamic interactions and feedback effects between these macroeconomic variables in relation to log shifts in Financial Market Risk.

Results: The results reveal different patterns in the impact of financial market risks on unemployment and inflation, as the results show a large and positive impact of financial market risks on unemployment. The results of the study indicate the presence of heterogeneous effects of financial market risks on inflation and the existence of a relationship between financial market risks and indicators of macroeconomic stability. There is also a relationship between forced migration and low inflation, and these trends indicate the existence of a dynamic between the market's perception of risks and the expected development of inflation. The relationship between the rate of forced migration and break-even inflation rates implies a correlation between the market's perception of risk and long-term inflation expectations.

Conclusions: This study concludes that concerns about a slowing economy (higher unemployment) and falling inflation (market-implied inflation) are the main factors worsening market risk.

Keywords: Financial Market Risk, Jordan, Two-State Markov Switching Process, Vector Autoregression.

العلاقات والتأثيرات الديناميكية بين مخاطر الأسواق المالية ومتغيرات استقرار الاقتصاد الكلي في الأردن

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ملخّص

الأهداف: تبحث هذه الدراسة في العلاقة المعقدة بين مخاطر السوق المالية وثلاثة مؤشرات لاستقرار الاقتصاد الكلي هي: معدل البطالة، والتضخم الرئيسي، وتضخم التعادل باستخدام البيانات الثانوية من يناير 2022 إلى ديسمبر 2023.

المنهجية: باستخدام الانحدار الذاتي المقارب للمتجه (VAR) المُحسّن بواسطة معيار معلومات شوارتز (SIC) وعملية تبديل ماركوف ذات الاحتمالية القصوى، تبحث هذه الدراسة في التفاعلات الديناميكية وتأثيرات التغذية المرتدة بين متغيرات الاقتصاد الكلي فيما يتعلق بتحولات السجل في المالية مخاطر السوق.

النتائج: تكشف النتائج عن أنماط مختلفة في تأثير مخاطر السوق المالية على البطالة والتضخم، حيث تُظهر النتائج تأثيرًا كبيرًا وإيجابيًا لمخاطر السوق المالية على البطالة، تشير نتائج الدراسة إلى وجود تأثيرات غير متجانسة لمخاطر السوق المالية على التضخم، ووجود علاقة بين مخاطر السوق المالية ومؤشرات استقرار الاقتصاد الكلي، وكذلك وجود علاقة بين الهجرة القسرية وانخفاض التضخم، وتشير هذه الاتجاهات إلى وجود ديناميكية بين تصور السوق للمخاطر والتطور المتوقع للتضخم. وتعني العلاقة بين معدل الهجرة القسرية ومعدلات التضخم التي تصل إلى نقطة التعادل ضمناً وجود ترابط بين تصور السوق للمخاطر وتوقعات التضخم على المدى الطويل.

الخلاصة: خلصت هذه الدراسة إلى أنّ المخاوف بشأن تباطؤ الاقتصاد (ارتفاع معدلات البطالة) وانخفاض التضخم (التضخم الضمني في السوق) هي العوامل الرئيسية التي تؤدي إلى تفاقم مخاطر السوق.

الكلمات الدالة: مخاطر السوق المالية، الأردن، عملية تبديل ماركوف على أساس الدولتين، الانحدار الذاتي المتجه.

INTRODUCTION

In the wake of the current global financial crisis, the number of articles arguing that macroeconomic forecasts should include financial risk indices has increased (Shakatreh et al., 2022). I focus on the interplay between financial market risk and two crucial macroeconomic policy variables — unemployment and inflation — drawing inspiration from the current debate on appropriate risk measures and their implications for these variables. Based on the standard deviation of financial market risk options, the Jordanian inflation volatility index is used as a proxy for financial market risk in my experiment. This study examines two inflation indicators and the unemployment rate in Jordan (Zraqat et al., 2021; Al Frijat et al., 2023).

This study distinguishes between headline inflation, which is based on surveys, and market-based breakeven inflation, which reflects investors' inflation expectations in the government bond market. As the BEI reflects real-time expectations of a large number of bond market participants, it has steadily gained traction as a credible indicator of inflation expectations for macroeconomic projections (Taha et al., 2023). Overall, the study argues that macroeconomic modeling and forecasting could benefit from greater emphasis on market risk dynamics than previously addressed in the literature.

The proper allocation of resources in a modern economy is highly dependent on financial institutions, which play a crucial role as intermediaries between units with surpluses and deficits (Fraihat et al., 2023). The strength of financial institutions is crucial, as demonstrated during the 2008 US financial crisis (Satoto, 2023) and other recent financial crises. The International Monetary Fund (2008) estimated that total losses worldwide had reached $945 billion by April 2008. Major banks around the world recorded write-downs of at least $274 billion on the eve of the one-year anniversary of the financial crisis. In contrast, other estimates suggest that the total value of US subprime mortgages and loans could exceed $1 trillion by July 2008 (Abuoliem et al., 2019; Alkhawaldeh et al., 2023a).

One of the biggest threats to any department is financial risks. Risk management plays a crucial role in evaluating the performance of banks. When it comes to risk management, the banking sector usually applies a positive and strategic approach. The organization's board of directors effectively formulates a clear risk management program for all courses. Among the many risk management techniques that affect financial performance, risk policy and the incorporation of risk management in setting organizational objectives are particularly important.

One of Jordan's most important economic sectors is the banking sector. The International Monetary Fund (2003) recorded an average GDP growth of 23.4% over the last five years, indicating that the banking sector in Jordan has reached a certain level of maturity. The Arab Spring, the global economic downturn, and the global financial crisis have contributed to a decline in the performance of the Jordanian banking sector in recent years (Al-Rjoub, 2021; Alhawamdeh et al., 2023b). As a result of financial liberalization and globalization, banks' competitiveness and good risk management have increased. These events have impacted the banking sector in Jordan and around the world.

From a Jordanian perspective, financial regulators in Jordan have employed a plethora of strategies to assess the situation and mitigate its negative effects. According to Zraqat (2020), Alkhawaldeh and Mahmood (2021), Basheer et al. (2022), and Ismaeel et al. (2023), these measures mainly targeted the financial crisis in the Jordanian banking sector.

There is a connection between macroeconomic stability, monetary stability, and fiscal stability. Nevertheless, these three terms refer to different aspects of economic stability and are often influenced by different policy measures (Borio, 2011; Smets, 2018). Additionally, factors such as currency, inflation, and interest rates are assessed by the Monetary Stability Index, while the Fiscal Stability Index evaluates government spending, taxation, and fiscal policy. Therefore, macroeconomic stability was the focus of this study because it offers a more comprehensive view, integrating monetary and fiscal policy. This stability protects against shocks and promotes sustainable economic growth (Saraceno, 2022).

For this study, unemployment, inflation, and breakeven inflation were chosen as indicators of macroeconomic stability. These indicators allow for a detailed assessment of the overall state of the economy, focusing on employment levels, price trends, and market expectations. They have a more direct impact on citizens and provide a broader perspective compared to narrower measures like nominal exchange rate depreciation and the budget deficit-to-GDP ratio (Chomicz-Grabowska and Orlopowski, 2020).

The increasing significance of stock markets in facilitating investment and mobilizing domestic and international resources has prompted renewed examination of the relationship between stock market growth and economic expansion. The question of whether stock market growth is a cause or an effect of economic growth remains debated. Examples of macroeconomic variables include civilian unemployment, annual inflation based on inflation rates, and short- and long-term breakeven inflation rates.

This analysis uses the longest available monthly series of financial market risk, unemployment rate, and inflation from January 2003 to December 2022. Monthly data was chosen because previous research on macroeconomic factors influencing stock market growth primarily used annual or quarterly data, unlike Jordan, which did not use monthly statistics. Using monthly data minimizes the risk of multicollinearity and maximizes observations to capture long-term dynamic fluctuations in stock market development. This approach also resolves issues related to annual measurement of market capitalization and stock flow.

LITERATURE REVIEW

There is a body of research suggesting that the interaction between financial market risk and indicators of macroeconomic stability is crucial for accurately predicting financial market stability. Among the evidence indicating that market-based inflation expectations significantly impact market risk are the works of Soderlind (2011) and Christensen and Gillan (2012). Orłowski and Soper (2019) discuss a counterintuitive causal response: real-time inflation forecasts by bond market participants are influenced by shifts in market risk. Findings from Orłowski (2012), Netšunajev and Winkelmann (2014), and Orłowski and Soper (2019) confirm that such reactions often occur in the "tails," a term denoting markets under high risk pressure. These tail reactions are asymmetric, with low inflation or deflation forecasts affecting market risk more significantly than high inflation expectations. Fleckenstein et al. (2017) support this conclusion, showing that declining consumer confidence increases market risk and the likelihood of deflation.

Moreover, Orłowski and Soper (2019) demonstrate that in calm and normal markets, changes in market risk correlate with inflation expectations, but in stressed markets, they become disconnected. Additionally, there are feedback loops and noticeable reversals in the dynamics between market risk and macroeconomic indicators that can extend over longer time horizons (Putnam et al., 2018). These phenomena highlight the complex relationship dynamics between the two. It is imperative to maintain control over both the financial system and the macroeconomic system to sustain long-term economic stability and prosperity.

The circumstances under which market risk influences macroeconomic variables and the assessment of market risk remain contentious (Fleming and Krishnan, 2012). Various factors are considered in forecasting market risk, including the term spread on US Treasury securities, the stock market volatility index (VIX), and key turning points. Chomicz-Grabowska and Orlowski (2020) investigate the feedback effects and dynamic interactions between the VIX and key macroeconomic stability variables such as the unemployment rate, headline inflation, and market-based inflation expectations (reflected in breakeven inflation), using the VIX as a proxy for financial market risk. They argue that existing literature has not sufficiently

addressed the importance of market risk in macroeconomic modeling and forecasting.

Using the longest available monthly US data, they conducted two-state Markov switching tests and vector autoregression with impulse response functions to explore these interactions. Alqaralleh et al. (2021) experimentally examined five developing markets from January 1995 to July 2019 to test the hypothesis that nonlinearity is instrumental in studying stock price responses to macroeconomic shocks. They used vector smooth transition regression with variables such as the real effective exchange rate, interbank interest rate, industrial production index, and stock market returns. Their findings suggest that nonlinearity in developing markets may stem from their susceptibility to extreme volatility triggered by changes in global financial liquidity or political and geopolitical developments.

The study highlights the asymmetric patterns that significantly differentiate equity returns, suggesting that some emerging markets respond asymmetrically to macroeconomic variables. This sheds light on critical characteristics of emerging markets that are pivotal to global economies and could inform policymakers seeking sustainable and replicable investment strategies to attract stakeholders.

The study examines commodity prices (gold, silver, platinum, crude oil, gasoline, natural gas, etc.) and their monthly time series data from June 2002 to September 2019, focusing on the Dow Jones Conventional and Islamic Stock Indices. Findings indicate that crude oil and platinum prices positively impact conventional stock prices significantly over the long term, whereas gold prices have a notable negative effect. For Islamic stock prices, the impact of energy commodity prices is negligible, but among precious metals, platinum shows a positive long-term effect while gold shows a negative one. This suggests differing long-term reactions to energy resources between conventional and Islamic indices, yet similar reactions to precious metal prices.

Additionally, both types of indices demonstrate comparable short-term effects and momentum responses to energy resources and precious metals. Mechri et al. (2022) investigate the volatility of five macroeconomic factors and their impact on stock market returns across five MENA countries, using an EGARCH model to fill a research gap. They analyze various stock market returns in relation to price effects and volatility of macroeconomic variables, evaluating four GARCH models empirically. These results are crucial for portfolio managers and global investors concerned with understanding stock market volatility drivers across different macroeconomic environments.

Moussa and Delhoumi (2022) explore the influence of interest rate and exchange rate changes on the primary stock market index using daily data from June 1998 to June 2018, employing the nonlinear autoregressive distributed lag (NARDL) model. Their findings confirm cointegration between the return index, interest rates, and exchange rates, revealing significant impacts of inflation uncertainty on financial institution efficiency. They also find that institutional quality positively moderates the correlation between inflation uncertainty and financial institution efficiency, while political instability amplifies the negative impact of macroeconomic risk on efficiency.

Braun (2023) focuses on the Basel III Accords introduced post-financial crisis to strengthen financial markets, emphasizing the overlooked aspect of banking sector diversity. Using a heterogeneous agent-based model, Braun assesses how Basel III rules affect market stability and mutual feedback effects in a diverse financial market. Computer simulations demonstrate that tailoring capital adequacy requirements to diverse intermediaries' business models and institutional frameworks optimizes market stability by stabilizing the banking sector and promoting stability in real estate and equity prices.

Goldstein (2023) examines the evolving role of financial markets in resource allocation and their "feedback effect" on corporate decisions. Analyzing empirical and theoretical perspectives, Goldstein highlights the impact of the FinTech

revolution on information processing in financial markets. The study establishes links between technological advancements, changes in the feedback effect, financial market efficiency, and economic decision-making, suggesting future research directions.

Gao et al. (2023) study the relationship between investor attention and green securities markets, revealing stable spillover effects between attention and green bond market returns and volatility. However, they find that the effects on the green stock market vary over time. Huang and Liu (2023) analyze cross-market risk spillover effects across global markets, highlighting significant links between sovereign credit default swaps (SCDS) and other markets, particularly equities, during major economic events. They underscore emerging markets as pivotal drivers of risk spillovers, influenced by economic fundamentals and market sentiment.

Kedward et al. (2023) advocate for a systemic approach to environmental and financial risk by policymakers, emphasizing the financial system's role in environmental damage and proposing interventions to mitigate harmful financial flows. Liu et al. (2023) examine the impact of oil price shocks and economic policy uncertainty on China's stock market returns, revealing time-varying effects and industry-specific responses to these shocks.

Lastly, Mohammed and Zheng (2023) conduct a comprehensive analysis of how macroeconomic indicators affect market risk appetite. They highlight diverse effects of inflation, interest rates, exchange rates, and industrial production on market dynamics and investor sentiment. Particularly noteworthy is their exploration of the nuanced relationship between these indicators and market risk, focusing on the impact of the COVID-19 pandemic on global financial markets.

RESEARCH METHODOLOGY

The paper employs data selection and testing techniques to examine the relationship between macroeconomic stability factors and financial market risk in Jordan. The analysis focuses on macro variables related to Jordan's objective of maintaining low unemployment and stable prices, akin to the Federal Reserve's "dual mandate." Specifically, the study investigates the relationship between changes in financial market risk (FMR), civilian unemployment (UE), and inflation (INF). The study distinguishes between breakeven inflation rates (5YBEINF and 10YBEINF), reflecting inflation expectations from government bond markets, and survey-based CPI inflation.

Monthly data, including FMR, UE, INF, 5YBEINF, and 10YBEINF, is sourced from the Federal Reserve Bank of St. Louis' Federal Reserve Economic Data (FRED). Ginindza and Maasoumi (2013) constructed an inflation volatility index based on the standard deviation of the consumer price index trend over seven-year periods. The inflation volatility index in this study utilizes the consumer price index, where index residuals are determined by regressing the index on its lagged value with a time trend, reflecting the oscillation of residual values over time as the inflation volatility index.

The study covers the period from January 2003 to December 2022, utilizing the maximum likelihood method with two states (Markov switching) and vector autoregression (VAR). Maximum-likelihood Markov switching models are fitted using the expectation maximization (EM) algorithm, particularly suitable for models with latent or unobserved parameters (Hamilton, 1990; see Augustyniak, 2014; Augustyniak et al., 2018).

Furthermore, traditional unit root tests such as Philipps-Perron (PP) and Augmented Dickey Fuller (ADF) are applied to test data stationarity. The study demonstrates how each chosen macroeconomic variable responds to logarithmic changes in FMR, employing a two-stage Markov switching process that allows for dynamic behavioral differences among variables in response to changes in FMR and the speed of adjustment.

Inflation expectations are shown to be influenced by economic events. Stable oil prices and prudent fiscal policies anchor

expectations in the first regime, while external shocks and increased government spending in the second regime contribute to inflationary pressures, altering expectations. Each state is characterized as "dominant" if expected to endure longer with a higher probability within a given month, contrasting with "subordinate" states that have shorter durations and lower probabilities:

State 1 is characterized by:

$$Q_{t/St=1} = \pi_1 + \varphi_1 X_t + \sigma_{1t} \qquad \sigma_{1t} \rightarrow N(0,1) \qquad (1)$$

State 2 is defined by:

$$Q_{t/St=2} = \pi_1 + \varphi_2 X_t + \sigma_{2t} \qquad \sigma_{2t} \rightarrow N(0,1) \qquad (1)$$

The matrix of transition was also characterised as follows:

$$R = \begin{bmatrix} R_{11} & R_{21} \\ R_{12} & R_{22} \end{bmatrix}$$

RESULTS AND DISCUSSION

Descriptive Statistics and Correlation Matrix

Table 1 presents descriptive statistics for the variables analyzed in the study. Mean values across the entire dataset indicate that FMR (financial market risk) is close to zero (-3.75E-08), while UE (unemployment) and INF (inflation) are 2.69 and 4.64, respectively. Median values generally align with the mean, suggesting moderate skewness. However, variables such as _10YBEINF and _5YBEINF exhibit discrepancies between mean and median, implying potential outliers. Maximum and minimum values denote the highest and lowest observed values in the dataset for each variable. For instance, UE and INF reach maximum values of 3.02 and 4.92, respectively. Standard deviations (Std. dev.) highlight variability within the dataset, with _10YBEINF and _5YBEINF showing notably high standard deviations compared to other indicators.

Skewness measures symmetry within the distribution; a positive skewness (>0) indicates a longer tail on the right side, while negative skewness (<0), as seen in INF (-0.640), indicates a slight left-skewed distribution. Kurtosis assesses the presence of outliers or extreme values; higher kurtosis values indicate more extreme observations. Notably, _5YBEINF exhibits significantly high kurtosis (13.99), suggesting a distribution with more extreme values compared to other variables.

Table 1 Descriptive Statistics

	FMR	UE	INF	_10YBEINF	_5YBEINF
Mean	-3.75E-08	2.691592	4.639757	7.50E-08	-1.67E-08
Median	-0.010262	2.663743	4.714963	-0.169143	-0.036444
Maximum	0.194022	3.016663	4.918453	2.265077	9.416367
Minimum	-0.154081	2.469110	4.245317	-0.922216	-3.091282
Std. Dev.	0.071194	0.172873	0.197302	0.649138	1.602265
Skewness	0.423408	0.590138	-0.640419	1.565600	2.220232
Kurtosis	3.178168	1.918579	2.075271	5.915965	13.99489

The table presents a correlation matrix showing relationships between the variables. FMR (financial market risk) exhibits a weak positive correlation with UE (unemployment), with a coefficient of 0.322, which is statistically significant (p = 0.000). INF (inflation) shows a weak negative correlation with FMR, measured at -0.136, which is also statistically significant (p = 0.034).

Correlations involving 10YBEINF, 5YBEINF, and other variables are generally low and not statistically significant (p > 0.05), except for the positive and statistically significant correlation between 5YBEINF and FMR at the 0.05 level (0.328). All correlation coefficients are below 0.8, indicating no issues with multicollinearity (Alkhawaldeh et al., 2023; Ismaeel et al., 2023).

Table 2 Correlation Matrix

	FMR	**UE**	**INF**	**10YBEINF**	**5YBEINF**
FMR	**1.000**				
UE	0.322*	**1.000**			
	(0.000)				
INF	-0.136**	0.438*	**1.000**		
	(0.034)	(0.000)			
10YBEINF	-0.087	-0.076	0.022	**1.000**	
	(0.179)	(0.236)	(0.724)		
5YBEINF	0.328*	-0.080	0.027	0.051	**1.000**
	(0.000)	(0.214)	(0.672)	(0.422)	

* and ** indicates the significance level at 1% and 5% respectively.

Table 3 presents the results of unit root tests conducted on the variables analyzed in the study using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. These tests assess the stationarity of the variables at both their original levels and after differencing them once. The results indicate that _10YBEINF exhibits significance in the first difference according to both ADF and PP tests at the 1% level, suggesting stationarity in the first difference but not at the level. Similarly, _5YBEINF demonstrates stationarity in the first difference based on both tests at the 1% significance level. Furthermore, FMR, INF, and UE also show stationarity in their first differences, significant at either the 1% or 5% level. The exception is UE in the ADF test, where significance is slightly above the 5% level.

Table 3 Unit root Test

	ADF				PP			
	Level		1st Diff.		Level		1st Diff.	
Variables	t stats	p values	t stats	p values	t stats	p values	t stats	p values
_10YBEINF	-2.480	0.121	-4.799*	0.000	-1.997	0.365	-12.316*	0.000
_5YBEINF	-1.746	0.406	7.543*	0.000	1.068	0.997	-10.6294*	0.000
FMR	-1.163	0.690	-4.026**	0.001	-1.470	0.547	-11.849*	0.000
INF	-2.129	0.233	-3.511**	0.008	-1.893	0.335	-11.598*	0.000
UE	-0.267	0.926	-3.242**	0.018	0.072	0.963	-10.976*	0.000

* and ** indicates the significance level at 1% and 5% respectively

Table 4 shows the results of the Markov switching model with two states for changes in unemployment (UE) and financial market risk (FMR): State 1: Transition probability (π_1): estimated at -0.191, marked as statistically significant at -4.094. The standard error (in parentheses) is given after the significance level. Coefficient (φ_1): Recorded as 1.169, marked as statistically significant at 6.856. This condition shows significant and positive transitions with the given coefficients, indicating a substantial effect of changes in FMR on UE. Condition 2: Transition probability (π_2): estimated at -0.139, marked as statistically significant at -2.341. Coefficient (φ_2): recorded at 0.325, statistically insignificant at 0.508. This condition illustrates a smaller but still negative impact of FMR changes on UE, although the coefficient is not statistically significant. Constant transition probabilities: Condition 1 shows a constant probability of staying (switching) of 0.4317, with a standard error of 0.173. Condition 2 shows a higher constant probability of staying (switching) at 0.876, with a larger standard error of 0.652. Constant expected duration: Condition 1 has an expected duration of 4.8 months. Condition 2 has a longer expected duration of 66.2 months.

The analysis reveals distinct patterns in the relationship between financial market risk (FMR) and unemployment (UE) across two states within the Markov switching model. In State 1, the estimated coefficients clearly demonstrate a significant positive impact of FMR on UE. This indicates that during periods characterized by State 1, changes in FMR notably influence and exacerbate fluctuations in unemployment rates. These findings suggest that economic challenges associated with increased FMR have a pronounced effect on unemployment dynamics in this state. Conversely, State 2 shows a relatively minor impact of FMR on UE, with the estimated coefficient being statistically insignificant. This implies that during periods characterized by State 2, changes in FMR do not significantly contribute to fluctuations in unemployment. However, this lack of statistical significance does not necessarily negate any effects; rather, it indicates that the influence of FMR on UE is less pronounced or discernible in this state. The disparities in occurrence frequencies and durations across states highlight variations in how FMR affects UE depending on the economic context. State 1, characterized by lower persistence likelihood and shorter expected duration, suggests a more volatile economic environment with frequent changes. In contrast, State 2 exhibits a higher probability of persistence and a significantly longer expected duration, indicating a more stable economic condition over an extended period.

Table 5 Markov Switching in Two States for UE and FMR Variations

STATE 1	$\pi_1 = -0.191^{*}\ (-4.094)$
	$\varphi_1 = 1.169^{*}\ (6.856)$
STATE 2	$\pi_2 = -0.139^{*}\ (-2.341)$
	$\varphi_2 = 0.325\ (0.508)$
Common terms:	AR (1) = 0.00017
	AR (2) = 0.115*
	AR (3) = 0.589*
	AR (4) = 0.311*
	AR (5) = 0.712*
	$log\rho = 1.842$
Diagnostic tests:	Log likelihood = 796.459
	Schwarz criterion =-0.458
	Durbin-Watson stat = 1.316
Constant Transition Probabilities, Probability of staying (switching):	
STATE 1	0.4317 (0.173)
STATE 2	0.876 (0.652)
Constant expected durations:	
State 1	4.8 months
State 2	66.2 months

* and ** indicates the significance level at 1% and 5% respectively

Table 5 presents the results of a two-state Markov switching model analyzing changes in inflation (INF) in relation to financial market risk (FMR) across different economic states. In State 1, π_1 (π1) indicates the estimated probability of transitioning from State 1 to State 2, which is -0.132 with a corresponding t-statistic of -3.198, showing statistical significance at the 1% level. This represents the likelihood of moving from a period characterized by State 1 (possibly reflecting certain economic conditions) to State 2 (a different economic scenario). φ_1 (φ1) shows the estimated impact of FMR changes on INF in State 1, which is 0.781. This coefficient is significant at the 1% level, indicating a substantial impact of FMR changes on inflation during periods characterized by State 1. In State 2, π_2 (π2) represents the estimated probability of transitioning from State 2 to State 1, which is -0.033 with a t-statistic of 0.291, indicating statistical insignificance at the 5% level. This implies that the probability of transitioning from State 2 to State 1 is not statistically significant. φ_2 (φ2) indicates the estimated impact of FMR changes on INF in State 2, which is 1.022. This coefficient is highly significant at the 1% level, indicating a significant impact of FMR changes on inflation during periods characterized by State 2.

Diagnostic tests such as the log-likelihood, Schwarz criterion, and Durbin-Watson statistic assess the validity and appropriateness of the model. The likelihood of transitioning between or remaining in different financial states, along with the expected duration of these states, is depicted by the probabilities of constant change and anticipated periods for both states. These findings demonstrate that during periods characterized by State 1, changes in financial market risk had a profound and enduring influence on inflation dynamics. In State 2, although financial market risk still significantly affects inflation, the likelihood of reverting to the previous state is minimal, suggesting a more persistent economic condition or regime where financial market risk has a consistent, stable impact on inflation. Considering different economic scenarios or regimes is crucial when exploring the relationship between financial market risk and inflation. The results indicate that under specific conditions (State 1), financial market risk significantly influences inflation, whereas in a different regime (State 2), it continues to impact inflation with a distinct level of persistence or stability. This understanding is essential for policymakers and investors, emphasizing the need for tailored strategies to manage inflation in response to financial market risk under varying economic conditions, taking into account the unique impact and persistence observed in each state.

Table 5 Markov Switching in Two States for INF and FMR Variations

STATE 1	$\pi_1 = -0.132^{*}\ (-3.198)$
	$\varphi_1 = 0.781^{*}\ (8.144)$
STATE 2	$\pi_2 = -0.033\ (0.291)$
	$\varphi_2 = 1.022^{*}\ (135.603)$
Common terms:	AR (1) = 0.00019
	AR (2) = 0.126*
	AR (3) = 0.481*
	AR (4) = 0.571*
	AR (5) = 0.312*
	$log\rho = 1.828$
Diagnostic tests:	Log likelihood = 794.176
	Schwarz criterion =-0.439
	Durbin-Watson stat = 1.480
Constant Transition Probabilities, Probability of staying (switching):	
STATE 1	0.760 (0.250)
STATE 2	-0.111 (0.669)
Constant expected durations:	
State 1	11.7 months
State 2	48.1 months

* and ** indicates the significance level at 1% and 5% respectively

Table 6 presents the results of the two-state Markov switching model analyzing changes in 5YBE (5-year breakeven inflation) and FMR (financial market risk). It reveals intriguing patterns in their interaction across different economic states. In State 1, the estimated probability (π_1) of transitioning to State 2 is -0.063, indicating a significant likelihood of moving from the current financial state (characterized by specific FMR conditions) to another state. The coefficient φ_1 of 1.003 suggests a substantial effect of FMR changes on 5YBE in this state. This indicates that fluctuations in financial market risk significantly influence 5YBE, reflecting how changes in financial market risk affect market expectations of inflation over a five-year period when the economy is in State 1. Conversely, the probability of reverting to State 1 from State 2 (π_2) is very low at -0.0018, suggesting a minimal likelihood of returning to the initial state. This scenario presents an intriguing situation where the coefficient φ_2 of -0.00024 indicates a negligible effect of FMR on 5YBE. In State 2, financial market risk appears to have little impact on 5YBE inflation, implying that the relationship between financial market risk and 5YBE inflation is less pronounced or observable in this state characterized by unique economic conditions.

These findings suggest that in certain economic conditions (State 1), variations in financial market risk significantly affect the 5-year breakeven inflation rate and shape market expectations regarding future inflation trends. In contrast, State 2 represents an economic scenario where FMR does not significantly influence the 5-year breakeven inflation rate, indicating a less sensitive or noticeable relationship between financial market risk and inflation expectations over the five-year horizon. These distinct patterns underscore the importance of considering diverse economic contexts when analyzing the relationship between FMR and 5YBE inflation expectations.

Table 6 Markov Switching in Two States for 5-Year Breakeven and FMR Variations

STATE 1	$\pi_1 = -0.063^{*}\ (-11.946)$
	$\varphi_1 = 1.003^{*}\ (114.748)$
STATE 2	$\pi_2 = -0.0018^{**}\ (3.053)$
	$\varphi_2 = -0.00024\ (-0.569)$
Common terms:	AR (1) = 0.00019
	AR (2) = 0.118*
	AR (3) = 0.404*
	AR (4) = 0.363*
	AR (5) = 0.419*
	$log\rho = 4.718^{*}$
Diagnostic tests:	Log likelihood = 772.387
	Schwarz criterion =-0.303
	Durbin-Watson stat = 1.299
Constant Transition Probabilities, Probability of staying (switching):	
STATE 1	-18.228 (-0.003)
STATE 2	-4.350 (-7.375)
Constant expected durations:	
State 1	9.5 months
State 2	98.9 months

* and ** indicates the significance level at 1% and 5% respectively

The results presented in Table 7 reveal an intriguing relationship between changes in the 5-year breakeven inflation (5YBE) and financial market risk (FMR) using a two-state Markov-switching model. In State 1, the estimated probability (π_1) of 0.0057 indicates a significant likelihood of transitioning to a different financial state. This state demonstrates a strong relationship between changes in FMR and 5YBE, with the coefficient φ_1 being 0.981. This suggests that variations in financial market risk notably impact market expectations of future inflation over a five-year horizon when the economy is in State 1. Conversely, the probability of returning to State 1 (π_2) decreases substantially to -0.0018 in State 2, indicating a lower likelihood of reverting to the initial state. Furthermore, the coefficient φ_2 of -0.0053 indicates a minor effect of FMR on 5YBE in State 2, characterizing a distinct economic scenario where the influence of financial market risk on the 5-year breakeven inflation rate is less pronounced.

These findings highlight that changes in FMR significantly shape market expectations of inflation over a five-year period in State 1, characterized by different economic conditions. In contrast, State 2 presents a scenario where the impact of FMR on 5YBE expectations is less significant, reflecting pronounced economic challenges. The distinct patterns observed in these two states underscore the importance of considering varying economic contexts when analyzing the relationship between FMR and expectations of inflation over a five-year horizon. They emphasize how different economic conditions can influence the effects of FMR on market expectations regarding future inflation trends.

Table 7 Markov Switching in Two States for 10-Year Breakeven and FMR Variations

STATE 1	$\pi_1 = 0.0057^{*}$ (4.222)
	$\varphi_1 = 0.981^{*}$ (56.201)
STATE 2	$\pi_2 = -0.0018^{**}$ (3.053)
	$\varphi_2 = -0.0053$ (−1.932)
Common terms:	AR (1) = 0.00017
	AR (2) = 0.107*
	AR (3) = 0.155*
	AR (4) = 0.114*
	AR (5) = 0.269*
	$log\rho = 4.589^{*}$
Diagnostic tests:	Log likelihood = 742.527
	Schwarz criterion =-0.053
	Durbin-Watson stat = 1.604
Constant Transition Probabilities, Probability of staying (switching):	
STATE 1	3.382 (9.561)
STATE 2	-2.971 (-9.246)
Constant expected durations:	
State 1	3.2 months
State 2	7.7 months

* and ** indicates the significance level at 1% and 5% respectively

Figure 1 illustrates the dynamic connections between unemployment (UE) and financial market risk (FMR) across various time periods, providing a visually compelling representation of their interactions and patterns. By mapping FMR and UE over these time frames, the figure offers a crucial depiction of their behavior. Visual representation helps in identifying potential patterns, trends, or anomalies in the relationship between FMR and UE, thereby enhancing understanding and analysis. The figures show the reliability of these estimates, showcasing the consistency or changes in values over time. Analysts can use this visual tool to forecast potential scenarios where FMR and UE may be interconnected based on observed long-term changes. This visual approach also simplifies the examination of temporal aspects related to these critical economic indicators and their interdependencies.

The fluctuation of variables, subject to innovation, is captured in both mean-reverting and explosive patterns, as demonstrated in the results. Figure 1 graphically illustrates the dynamic relationships between FMR and UE over time, aiding in comprehension of their interactions and changes. This visualization enhances researchers' ability to evaluate data and dependencies between FMR and UE, facilitating pattern recognition and anomaly detection. By presenting transparency in assessing these dependencies through the display of consistency or changes in values over time, it offers valuable insights for analysts studying the temporal dynamics and relationships of these important economic indicators.

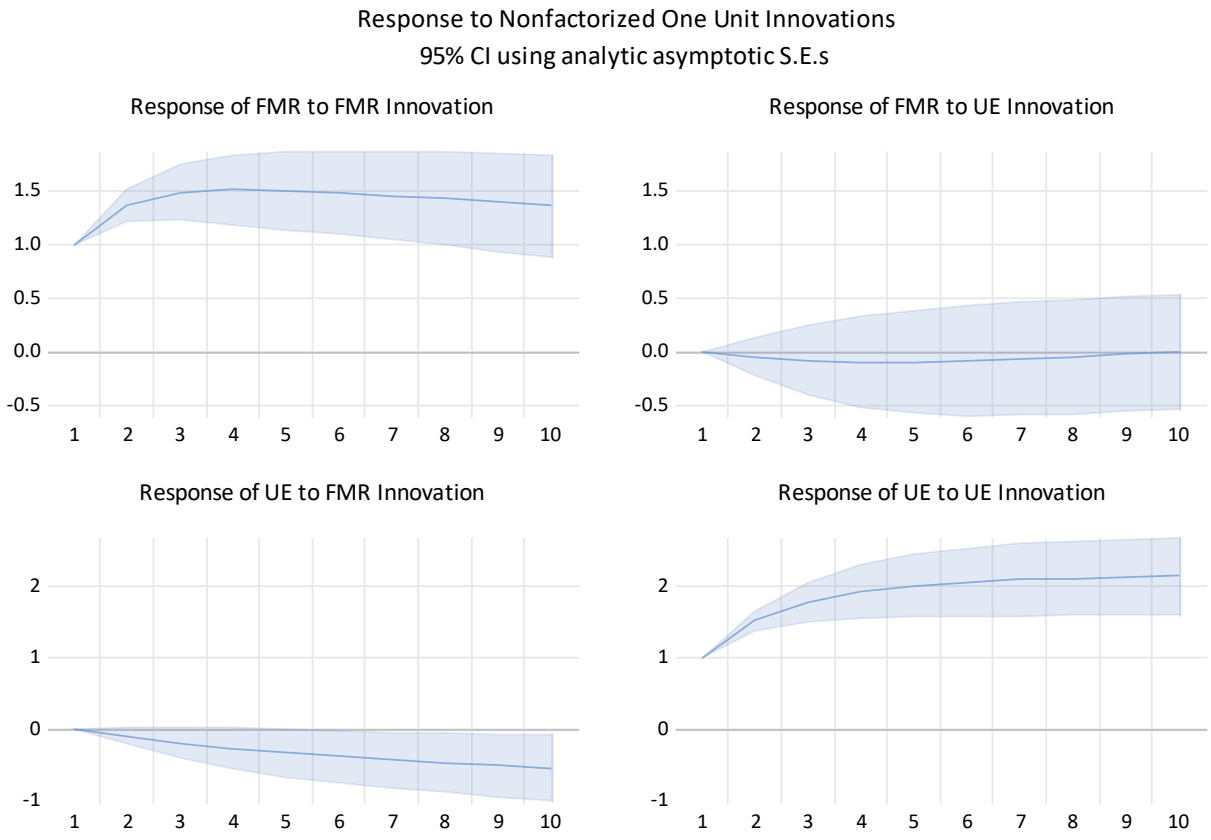


Figure 1 Impulse Responses between FMR and UE

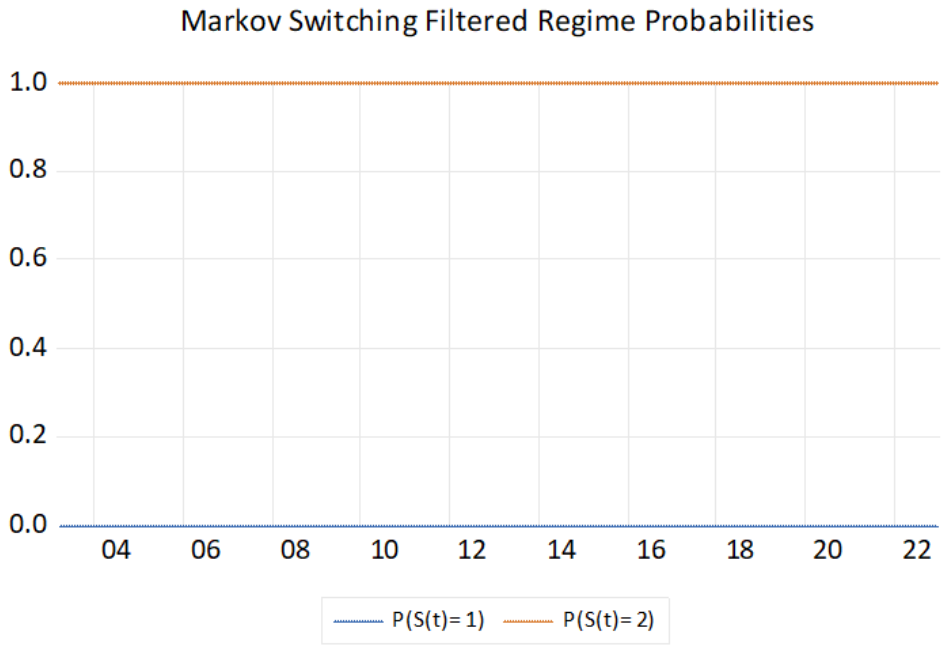


Figure 2 illustrates the trend in financial market risk (FMR) over a ten-period span, revealing a consistent increase in perceived risk, volatility, or uncertainty among capitalists. This trend indicates a growing awareness of risk in the current economic environment. FMR, being sensitive to market conditions, influences market behavior, investment decisions, and overall economic activities. In contrast, the inflation pattern (INF) depicted in the figure shows a steady decline in the rate of price increases for goods and services. This decline could stem from factors such as reduced consumer demand, stable commodity prices, or fiscal policies aimed at curbing inflationary pressures.

The accuracy and reliability of these trends are pivotal for assessing the quality of estimates. Smaller standard errors indicate more precise and reliable estimates, while larger errors suggest greater uncertainty or irregularity in the data. These insights are invaluable for policymakers, investors, and economists aiming to grasp the critical relationship between inflation trends and future assumptions in financial markets. The findings also underscore the mean-reverting and explosive nature of variables in response to interventions. Figure 2 demonstrates that FMR continues to rise steadily across the ten periods, indicating escalating risk perceptions. Concurrently, inflation exhibits a consistent downward trend over the same timeframe, reflecting economic conditions such as reduced consumer demand or effective fiscal policies. Understanding the timeliness of these trends is essential for policymakers and investors alike, as it informs decisions regarding the relationship between FMR and inflation and guides strategic actions in financial markets.

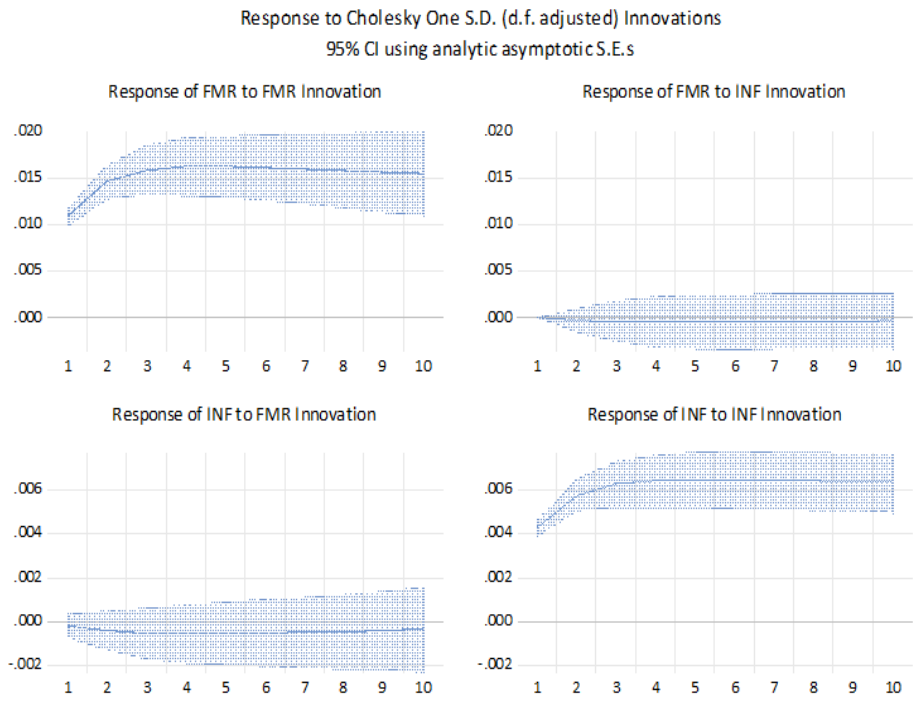


Figure 2 Impulse Responses between FMR and INF

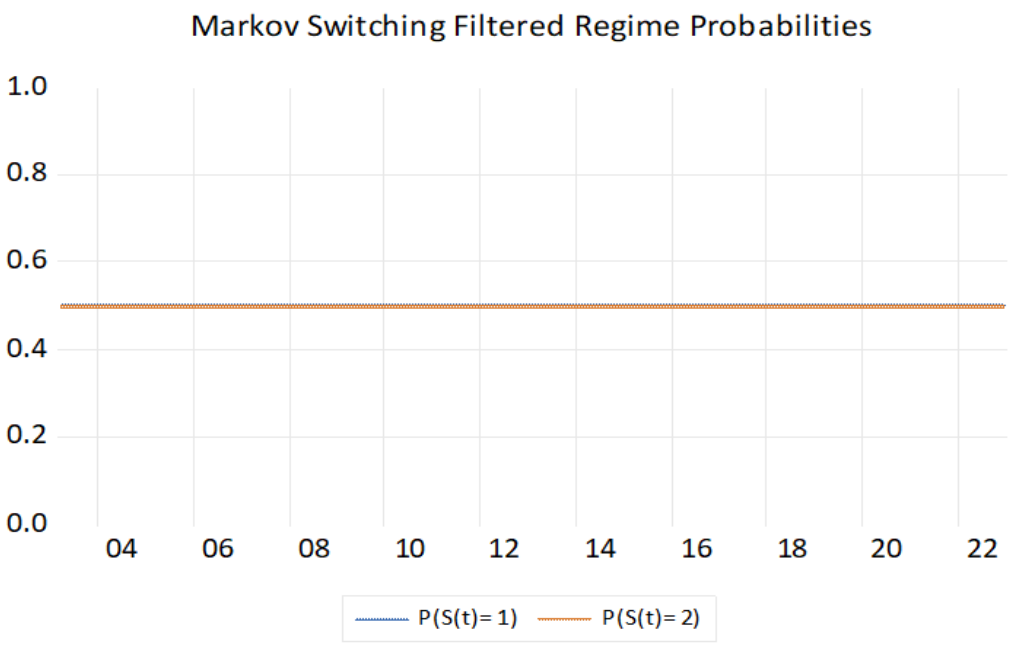


Figure 3 depicts the response of financial market risk (FMR) alongside the increase in 5-year breakeven inflation (5YBEINF) over a span of 10 time periods. FMR exhibits a dynamic upward trend, suggesting an increasing perception of risk or a growing dimension of risk in economic markets. In contrast, 5YBEINF follows a distinct pattern, consistently trending higher over the same period, indicating a gradual rise in anticipated inflation rates. The concurrent escalation of economic market risk and expected inflation points to a nuanced interaction between these two economic indicators. Such simultaneous increases may signify a robust relationship between market risk perception and inflation expectations. Market risk is closely tied to assumptions about inflation; heightened market risk could prompt investors to hedge against potential losses by adjusting their expectations for future inflation rates. This adjustment is reflected in the breakeven inflation indicators.

The synchronized rise in financial market risk and inflation expectations may also hint at underlying economic dynamics. Factors such as economic uncertainty, geopolitical tensions, or shifts in fiscal policies can amplify the perception of risk in economic markets, influencing expectations regarding future inflation rates. Understanding these simultaneous dynamics is crucial as they suggest potential links between financial market behaviors and inflation expectations. Further research is necessary to delineate the precise causal relationships and their implications for financial stability and investor behavior. Exploring these dynamics can provide insights into how market participants respond to changing economic conditions and uncertainties, shaping their strategies and expectations in financial markets.

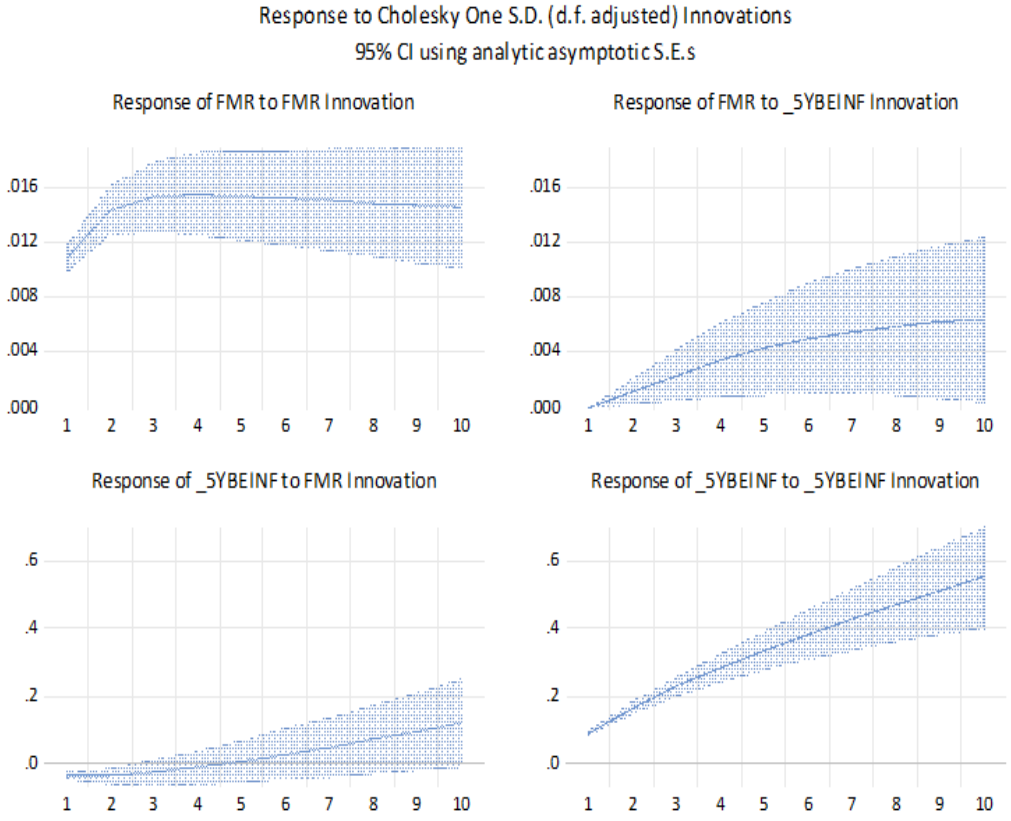
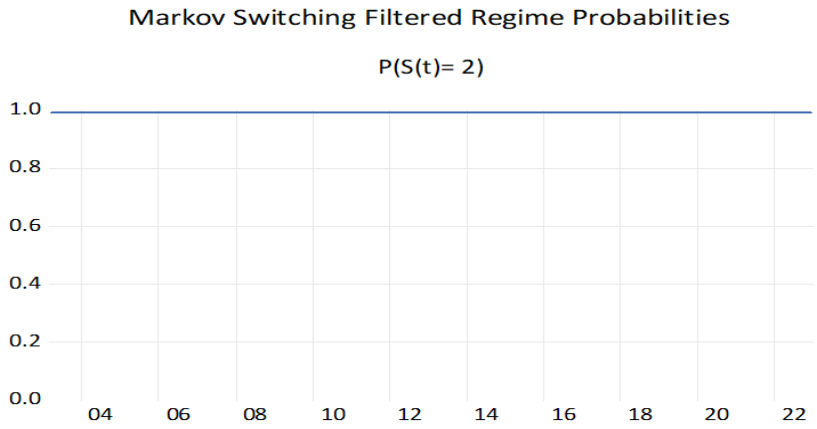


Figure 3 Impulse Responses between FMR and 5YBINFL



The correlation depicted in Figure 4 reveals an intriguing trend. A consistent increase in financial market risk (FMR) over time has coincided with a corresponding decrease in 10-year breakeven inflation expectations. The rising perception of risk in financial markets appears to influence investors' expectations regarding future inflation. This suggests that FMR may signal a level of uncertainty or unease among market participants, prompting adjustments in their behavior and potentially affecting their outlook on future inflation rates. The relationship observed between FMR and breakeven inflation expectations implies a connection where market threats and long-term inflation projections are intertwined. Investors may adjust their forecasts for future inflation downward in response to heightened market risks, adapting to these increased uncertainties and their potential impact on inflation. This link between market perceptions, risk, and inflation underscores important implications for policymakers and investors alike: namely, how market sentiment shapes long-term inflation expectations and thereby influences financial decisions and market dynamics. Further research is needed to elucidate the underlying mechanisms driving this relationship and its implications for financial stability and market behavior.

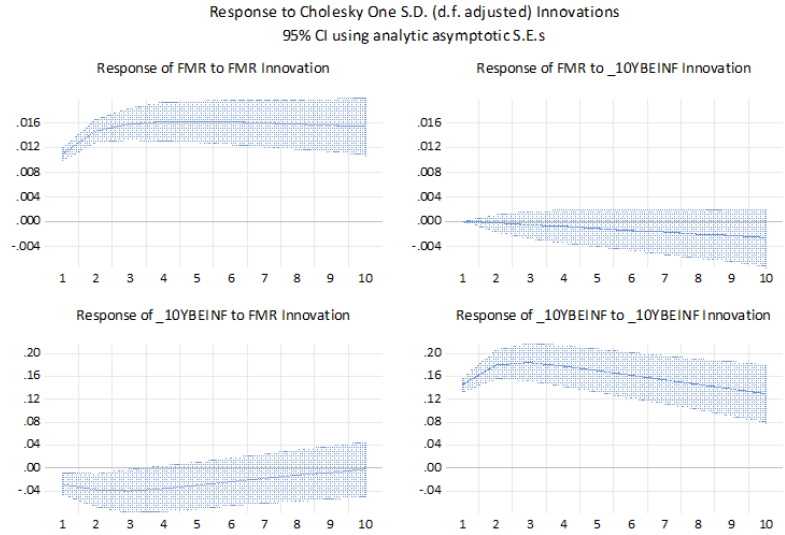


Figure 4 Impulse Responses between FMR and 10YBINFL

Limitations and Recommendation for Future Studies

This study has several limitations. It utilizes a narrow set of macroeconomic indicators, focusing solely on unemployment, CPI inflation, and breakeven inflation, while excluding key indicators such as exchange rates and budget deficits. The short time period covered (January 2023 to December 2022) restricts the analysis of macro-financial linkages across full business cycles. Moreover, using monthly data may not adequately capture feedback effects that manifest over longer time horizons. The Markov switching model relies on subjective choices for determining the number of regimes and transition probabilities. Additionally, no formal causality analysis is conducted to establish the direction of effects.

To address these limitations, several extensions are recommended for further research. First, incorporating a broader set of macroeconomic stability variables including exchange rates and the budget deficits to GDP ratio would offer a more comprehensive assessment of the macro-finance nexus. Second, extending the time period to cover 2-3 decades would allow for analysis across complete business cycles and different monetary policy regimes; using annual or quarterly data would be more suitable for this purpose. Third, employing causal analytical techniques such as Granger causality and impulse response functions would formally test the directions of causation between variables. Fourth, using time series analytical models like ARDL and VECM would avoid the need for subjective choices and could reveal long-run equilibrium relationships. Finally, comparing findings with data from other developing countries that are reliant on oil exports and affected by global financial cycles would help generalize the study's conclusions.

Conclusion and Implication of the Study

The study investigates the intricate relationship between financial market risk (FMR) and three key indicators of macroeconomic stability—unemployment rate, headline inflation, and breakeven inflation—using data from January 2023 to December 2022. The impulse response functions and VAR (2) estimates indicate that positive shocks to financial market risk gradually lead to an increase in the unemployment rate. There are two plausible explanations for this phenomenon. Firstly, market shocks often anticipate an economic downturn and subsequent rise in unemployment. Secondly, expectations of long-term economic growth support financial market stability. The observed response pattern reinforces the idea that stable finances are associated with lower future unemployment and sustainable economic growth.

According to the two-state Markov switching model, there is no statistically significant correlation between financial market risk and unemployment when markets are stable. However, during periods of financial strain, this correlation becomes notably strong and adverse. Positive reactions, indicating a significant correlation between rising unemployment and heightened market risk, are sporadic. Noteworthy instances of such reactions occurred in 2011, 2018, and 2021, as indicated by filtered probabilities for regime changes. Impulse responses between changes in financial market risk and headline inflation reveal that positive shocks to market risk typically coincide with concerns about deflation or falling inflation rates. When investors anticipate price declines and reduced profitability, market risk escalates. The two-state Markov switching test monitoring their relationship over time shows sporadic positive interactions between market risk and inflation expectations in 2017 and 2019.

The interaction of financial market risk with changes in breakeven inflation rates over five and ten years exhibits distinct patterns. Positive shocks to market risk correlate with short-term and long-term trends of declining inflation, as indicated by impulse responses. The two-state Markov switching analysis for these variables suggests a modest relationship between market risk and breakeven inflation during normal market phases, intensifying to a negative and robust correlation under market pressure. The financial crisis peak in 2019 saw a sharp increase in market risk due to deflation fears based on five-

year inflation trends. Both the severity and frequency of occurrences where financial market risk aligns with ten-year inflation trends have been increasing. In summary, the analysis concludes that concerns over economic slowdown (reflected in higher unemployment) and decreasing inflation expectations (reflected in market-implied inflation) are primary factors amplifying market risk.

REFERENCES

Abaidoo, R., & Agyapong, E. K. (2023). Inflation uncertainty, macroeconomic instability and the efficiency of financial institutions. ***Journal of Economics and Development***, *25*(2), 134-152. https://doi.org/10.1108/JED-09-2022-0166

Abdelbaki, H. H. (2019). Macroeconomic determinants of non-performing loans in GCC economies: does the global financial crisis matter?. ***International Journal of Economics and Business Research***, *17*(4), 433-447. https://doi.org/10.1504/IJEBR.2019.099973

Abuoliem, N., Nor, S. M., Lola, M. S., & Matar, A. (2019). Dynamic interactions among the industrial sector and its determinants in Jordan. ***Investment Management and Financial Innovations***, *16*(4), 325-341. doi:10.21511/imfi.16(4).2019.28

Abuoliem, N., Nor, S. M., Matar, A., & Hallahan, T. (2019). Crude oil prices, macroeconomic indicators and the financial sector in Jordan: Dynamic causes and responses. ***Journal of International Studies (2071-8330)***, *12*(3), 131-146

Al Frijat, Y. S., Albawwat, I. E., & Elamer, A. A. (2023). Exploring the mediating role of corporate social responsibility in the connection between board competence and corporate financial performance amidst global uncertainties. ***Corporate Social Responsibility and Environmental Management***, 1-17. https://doi.org/10.1002/csr.2623

Alhawamdeh, H., Al-Eitan, G. N., Hamdan, M. N., Al-Hayek, Y. A. M., Zraqat, O., Alhawamdeh, A. M., ... & Alkhawaldeh, B. Y. (2023b). The Role Of Financial Risk Tolerance And Financial Advisor Management In Mediating The Relationship Between Financial Attitudes, Financial Knowledge, Financial Anxiety, And Sustainable Financial Retirement Planning. ***Journal of Namibian Studies: History Politics Culture***, *33*, 5071-5100. https://doi.org/10.59670/jns.v33i.3001

Alkhawaldeh, B. Y. S., Alhawamdeh, H., Almarshad, M., Fraihat, B. A. M., Abu-Alhija, S. M. M., Alhawamdeh, A. M., & Ismaeel, B. (2023a). The effect of macroeconomic policy uncertainty on environmental quality in Jordan: Evidence from the novel dynamic simulations approach. ***Jordan Journal of Economic Sciences***, *10*(2), 116-131. https://doi.org/10.35516/jjes.v10i2.1399

Alqaralleh, H., Al-Majali, A., & Alsarayrh, A. (2021). Analyzing the Dynamics Between Macroeconomic Variables and the Stock Indexes of Emerging Markets, Using Non-linear **Methods.** ***International Journal of Financial Research***, *12*(3), 193-204. https://doi.org/10.5430/ijfr.v12n3p193

Al-Rjoub, S. A. (2021). A financial stability index for Jordan. *Journal of Central Banking Theory and Practice*, *10*(2), 157-178. https://doi.org/10.2478/jcbtp-2021-0018

Augustyniak, M. (2014). Maximum likelihood estimation of the Markov-switching GARCH model. ***Computational Statistics & Data Analysis***, 76, 61-75.

Augustyniak, M., Boudreault, M., & Morales, M. (2018). Maximum likelihood estimation of the Markov-switching GARCH model based on a general collapsing procedure. ***Methodology and Computing in Applied Probability***, 20(1), 165-188.

Basheer, Z. M., Jadaan, O. A., & Mohammed, H. D. (2022). Determinants of Macroeconomics in Jordanian Islamic Banks. ***Journal of Business and Management Studies***, *4*(4), 179-186. https://doi.org/10.32996/jbms.2022.4.4.17

Borio, C. (2011). Rediscovering the macroeconomic roots of financial stability policy: Journey, challenges, and a way forward. Annu. Rev. ***Financ. Econ***., 3(1), 87-117.

Braun, J. (2023). Taming Housing and Financial Market Instability: The Effect of Heterogeneous Banking Regulations. Journal of Real Estate Research, 1-34. https://doi.org/10.1080/08965803.2023.2206284

Chomicz-Grabowska, A. M., & Orlowski, L. T. (2020). Financial market risk and macroeconomic stability variables: dynamic interactions and feedback effects. ***Journal of Economics and Finance***, *44*, 655-669. https://doi.org/10.1007/s12197-020-09505-9

Fraihat, B. A. M., Ahmad, A. Y. B., Alaa, A. A., Alhawamdeh, A. M., Soumadi, M. M., Aln'emi, E. A. S., & Alkhawaldeh, B. Y. S. (2023). Evaluating technology improvement in sustainable development goals by analysing financial development and energy consumption in Jordan. ***International Journal of Energy Economics and Policy***, *13*(4), 348. https://doi.org/10.32479/ijeep.14438

Gao, Y., Li, Y., & Wang, Y. (2023). The dynamic interaction between investor attention and green security market: an empirical study based on Baidu index. ***China Finance Review International***, *13*(1), 79-101. https://doi.org/10.1108/CFRI-06-2021-0136

Ginindza, M., & Maasoumi, E. (2013). Evaluating inflation targeting based on the distribution of inflation and inflation volatility. ***The North American Journal of Economics and Finance***, 26, 497-518.

Godil, D. I., Sarwat, S., Khan, M. K., Ashraf, M. S., Sharif, A., & Ozturk, I. (2022). How the price dynamics of energy resources and precious metals interact with conventional and Islamic Stocks: Fresh insight from dynamic ARDL approach. ***Resources Policy***, *75*, 102470. https://doi.org/10.1016/j.resourpol.2021.102470

Goldstein, I. (2023). Information in financial markets and its real effects. ***Review of Finance***, *27*(1), 1-32. https://doi.org/10.1093/rof/rfac052

Gopinathan, R., & Durai, S. R. S. (2019). Stock market and macroeconomic variables: new evidence from India. ***Financial Innovation***, *5*, 1-17. https://doi.org/10.1186/s40854-019-0145-1

Huang, W. Q., & Liu, P. (2023). Cross-market risk spillovers among sovereign CDS, stock, foreign exchange and commodity markets: An interacting network perspective. ***International Review of Financial Analysis***, *90*, 102875. https://doi.org/10.1016/j.irfa.2023.102875

Ismaeel, B., Alkhawaldeh, B. Y., & Alafi, K. K. (2023). The role of marketing intelligence in improving the efficiency of the organization: An empirical study on Jordanian hypermarkets. ***Journal of Intelligence Studies in Business***, 13(2), 32-42. https://doi.org/10.37380/jisib.v13i2.1082

Kedward, K., Ryan-Collins, J., & Chenet, H. (2023). Biodiversity loss and climate change interactions: financial stability implications for central banks and financial supervisors. ***Climate Policy***, *23*(6), 763-781. https://doi.org/10.1080/14693062.2022.2107475

Khan, M. I., Teng, J. Z., Khan, M. K., Jadoon, A. U., & Khan, M. F. (2021). The impact of oil prices on stock market development in Pakistan: Evidence with a novel dynamic simulated ARDL approach. ***Resources Policy***, *70*, 101899. https://doi.org/10.1016/j.resourpol.2020.101899

Liu, Z., Ding, Z., Lv, T., Wu, J. S., & Qiang, W. (2019). Financial factors affecting oil price change and oil-stock interactions: a review and future perspectives. ***Natural Hazards***, *95*, 207-225. https://doi.org/10.1007/s11069-018-3473-y

Liu, Z., Zhu, T., Duan, Z., Xuan, S., Ding, Z., & Wu, S. (2023). Time-varying impacts of oil price shocks on China's stock market under economic policy uncertainty. ***Applied Economics***, *55*(9), 963-989. https://doi.org/10.1080/00036846.2022.2095342

Mechri, N., de Peretti, C., & Hamad, S. B. (2022). How Do Macroeconomic Variables Volatilities Affect Stock Markets Dynamics? Evidence From MENA Zone. ***International Journal of Business***, *27*(3), 1-21.

Mohammed, M., & Zheng, M. (2023). ***The impact of macroeconomic factors on the propensity of risk: How macroeconomic factors influence the level of risk in different stock market***. Master thesis, The Blekinge Institute of Technology is a public, Sweden.

Moussa, F., & Delhoumi, E. (2022). The asymmetric impact of interest and exchange rate on the stock market index: evidence from MENA region. ***International Journal of Emerging Markets***, *17*(10), 2510-2528. https://doi.org/10.1108/IJOEM-01-2020-0089

Nguyen, T., Chaiechi, T., Eagle, L., & Low, D. (2020). Dynamic impacts of SME stock market development and innovation on macroeconomic indicators: A Post-Keynesian approach. ***Economic Analysis and Policy***, *68*, 327-347. https://doi.org/10.1016/j.eap.2020.10.002

Peykani, P., Sargolzaei, M., Takaloo, A., & Valizadeh, S. (2023). The Effects of Monetary Policy on Macroeconomic Variables through Credit and Balance Sheet Channels: A Dynamic Stochastic General Equilibrium Approach. ***Sustainability***, *15*(5), 4409. https://doi.org/10.3390/su15054409

Saraceno, F. (2022). The return of fiscal policy: The new European Union macroeconomic activism and lessons for future reform (No. 59). ILO Working Paper.

Satoto, E. B. (2023). The Effect of Fuel Price Fluctuations, Exchange Rates, and Profitability on Stock Returns and Inflation as Intervening Variables. ***Jurnal Ilmiah Manajemen dan Bisnis***, *8*(1), 110-127. https://doi.org/10.38043/jimb.v8i1.4460

Sethi, S. (2015). Inflation, inflation volatility and economic growth: The case of India. ***IUP Journal of Applied Economics***, 14(3), 25.

Shakatreh, M., Moh'd Ahmad Mansour, A., & Alatyat, Z. A. (2022). Corporate tax features in Jordan affecting business decisions: Strengthening finance accountability in emerging economies. ***International Journal of Professional Business Review: Int. J. Prof. Bus. Rev.***, *7*(4), 24. https://doi.org/10.26668/businessreview/2022.v7i4.e739

Smets, F. (2018). Financial stability and monetary policy: How closely interlinked?. 35th issue (June 2014) of the ***International Journal of Central Banking***.

Taha, R., Taha, N., & Ananzeh, H. (2023). Determinants of litigation risk in the Jordanian financial sector: the role of firm-specific indicators. ***Journal of Financial Reporting and Accounting***. Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/JFRA-05-2023-0239

Zraqat, O. M. (2020). The moderating role of business intelligence in the impact of big data on financial reports quality in Jordanian telecom companies. ***Modern Applied Science***, *14*(2), 71-85. https://doi.org/10.5539/mas.v14n2p71

Zraqat, O., Zureigat, Q., Al-Rawashdeh, H. A., Okour, S. M., Hussien, L. F., & Al-Bawab, A. A. (2021). The effect of corporate social responsibility disclosure on market performance: Evidence from Jordan. ***The Journal of Asian Finance, Economics and Business***, *8*(8), 453-463. https://doi:10.13106/jafeb.2021.vol8.no8.0453