



**Dynamic Spillover of Risk between Exchange Rates, Stocks,
Housing, and Gold Coins in Iran: New Evidence from
Comparing Sanction and Non-Sanction Periods¹**

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INTRODUCTION

Exchange rate expectations play a critical role in stock price fluctuations. According to purchasing power parity theory, inflation drives an increase in exchange rates to preserve economic competitiveness. Consequently, a strong relationship exists among exchange rates, inflation, and stock prices.

Empirical studies underscore this relationship. Zhao (2010) found no long-term equilibrium between the real effective exchange rate and stock

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prices in China but identified bidirectional spillover effects. Delgado et al. (2018) reported a significant negative impact of exchange rates on Mexico's stock market. Gupta et al. (2001) observed unidirectional causality from stock prices to interest rates and a weak unidirectional causality from exchange rates to stock prices. Akar (2011), employing the DCC-GARCH model, analyzed Turkey's stock, gold, and currency markets, concluding that asset correlations varied over time, particularly during the 2001 crisis. Sener et al. (2013) investigated dynamic conditional correlations among stocks, bonds, gold, oil, and exchange rates. Their findings suggest that bonds serve as a hedge against stock market fluctuations, while gold mitigates exchange rate volatility, acting as a safe haven in the U.S. and the U.K. Younos (2020) examined the relationships among gold, stocks, bonds, and real estate in the U.S., finding that before the 2007 financial crisis, gold was not an effective hedge. However, during the 2007–2009 crisis, gold remained relatively stable amid economic shocks, functioning as a weak safe haven. Lee et al. (2021) explored the relationship between commodity and financial asset returns in the U.S. and China during the COVID-19 pandemic using the TVP-VAR model. Their results indicated a stronger connection in the U.S. than in China, with the relationship intensifying during the pandemic. Before the peak of COVID-19, gold was a net transmitter of volatility; afterward, stocks and currencies assumed this role, while corn emerged as a net receiver of volatility. Liu et al. (2021) assessed market volatility across China's major financial sectors using the TVP-VAR model, revealing weak volatility correlations among housing, stock, bond, currency, and commodity futures markets. Bonds were the primary transmitters of volatility, while commodity futures absorbed the most volatility. The study also noted increased spillovers during financial crises. Liu et al. (2022) investigated liquidity linkages among Malaysia's financial markets—stocks, bonds, money, and foreign exchange—using the TVP-VAR model. They found that liquidity flows intensified during extreme economic and political events, suggesting minimal liquidity transfer risk across Malaysia's financial markets.

Existing studies have not yet examined volatility transmission and reception among assets such as exchange rates, gold coins, stocks, and real

estate using the DY-TVP-VAR approach. Unlike traditional models like DCC-GARCH and DCC-FIAPARCH, this method provides a more precise analysis of causality and the intensity of volatility transmission. This capability is particularly valuable for policymakers and investors seeking to navigate complex financial dynamics.

MATERIAL AND METHODS

In this study, drawing on the works of Asadi et al. (2022), Reboredo et al. (2021), Yunus (2020), and Mensah et al. (2017), the spillover effects of risk among exchange rates, gold coins, stock indices, and housing price indices were analyzed on a monthly basis using the DY-TVP-VAR model. The analysis spans the period from 1385:01 to 1400:12 (March 2006 to March 2022) in the Iranian calendar, covering significant economic and political events that have impacted Iran's economy. These events likely influenced the transmission and reception of volatility across the examined assets. All required data were sourced from the Financial and Economic Information System of the Ministry of Economic Affairs and Finance and the Economic Indicators published by the Central Bank of Iran.

RESULTS AND DISCUSSION

According to Chart 1, a positive relationship exists between the volatility of returns in the housing sector and stocks, with the peak observed in 2008–2009. In contrast, the relationship between housing returns and gold coins is negative, while the relationship between gold coins and stocks has also been negative across many periods, reaching its highest level from 2018 onward. Similarly, the relationship between housing and exchange rates has been negative, with the strongest effect recorded between 2008 and 2013. For stocks and exchange rates, a generally negative relationship prevails, which has intensified since 2018. However, the relationship between exchange rates and gold coins varies: during periods of milder sanctions (when sanctions were less severe), it was negative, whereas during times of heightened sanctions, it turned positive.

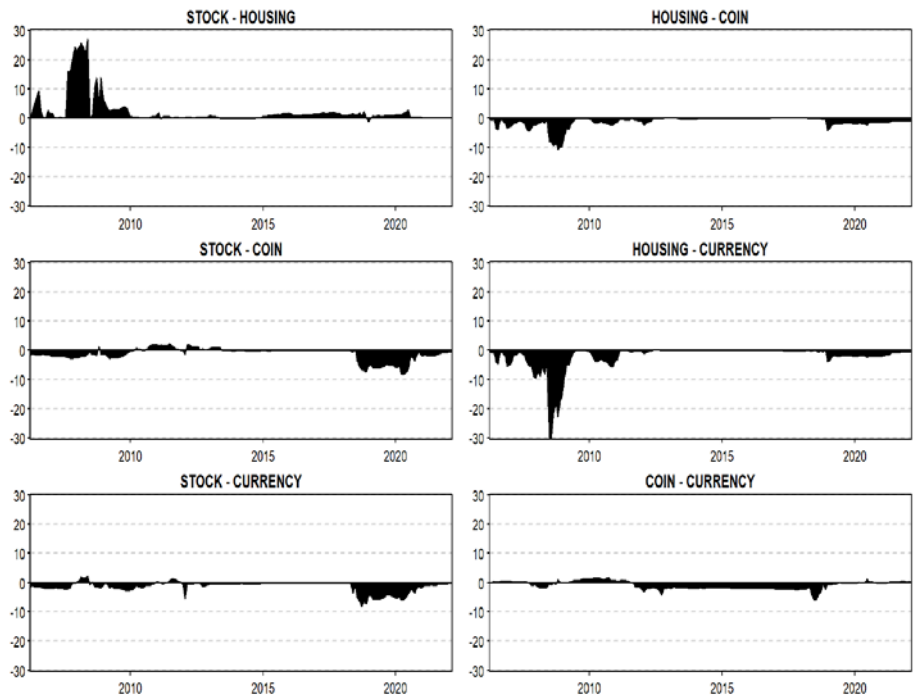


Diagram 1. Pure dynamic two-to-two relationship between assets

The systematic relationships between various assets are presented in Chart (2).

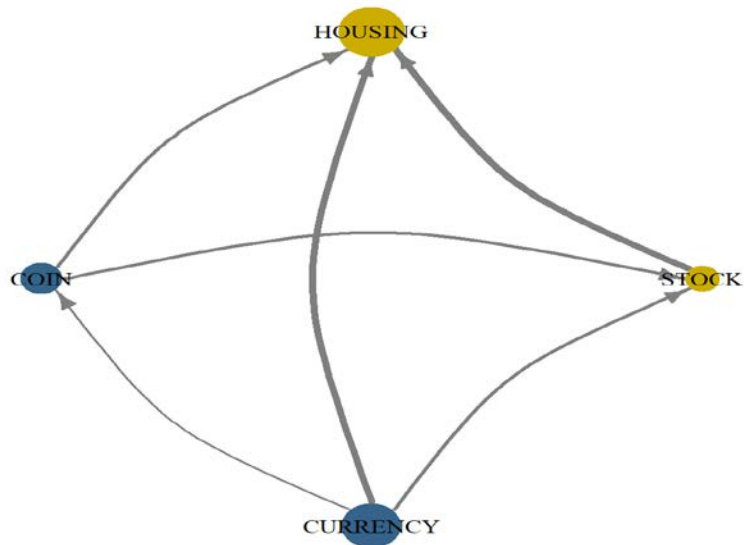


Chart 2. Systematic connection between different assets



Chart 2 illustrates which assets act as receivers and which as transmitters of volatility in general. Notably, the size of each arc reflects the intensity of volatility received or transmitted. The housing market emerges solely as a receiver of volatility from other assets, with no evidence of volatility transmission from housing to other markets. The most substantial volatility transfer to the housing market originates from the foreign exchange and stock markets. The foreign exchange market functions exclusively as a transmitter of volatility to other markets, with the highest transmission directed toward the housing market, followed by nearly equal levels of volatility received by the stock and gold coin markets. The gold coin market, in turn, receives volatility solely from the foreign exchange market and transmits its own volatility to both the stock and housing markets, with the intensity of this transfer being equivalent in both cases. Additionally, during the period under review, the stock market serves as both a receiver and a transmitter of volatility: it absorbs volatility from the foreign exchange and gold coin markets while channeling volatility to the housing market. After the foreign exchange market, the stock market ranks as the second most significant transmitter of volatility to the housing market.

CONCLUSION

In today's interconnected financial landscape, markets are closely linked, a phenomenon amplified by financial innovations. In Iran, the housing and gold coin markets are regarded as safe-haven investments, capable of both influencing and being influenced by other markets. This study investigates risk spillovers among exchange rates, housing, gold coins, and stocks from 2006 to 2022, employing the DY-TVP-VAR model. The findings indicate that exchange rates and gold coins serve as the primary sources of volatility within these markets, both transmitting and receiving volatility from other assets. During periods of intensified sanctions, particularly from 2018 onward, the transmission and reception of volatility increased significantly. Exchange rates predominantly acted as a transmitter of volatility, while housing functioned primarily as a receiver. The stock market absorbed risk from both exchange rates and gold coins, with housing emerging as the main recipient of volatility, especially from exchange rates. The study suggests that holding gold coins and exchange rates does not offer effective risk mitigation, whereas housing can

serve as a hedge. During high-volatility periods, such as those marked by sanctions, the DY-TVP-VAR model provides superior insights for managing investment portfolios.

Keywords: Housing, Exchange Rate, Gold Coins, Stock Market, DY-TVP-VAR Model.

JEL Classification: G01, G11, G17, G32.

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