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The Relationship between Interest Rate Fluctuations and the Amman Stock Exchange and Real Estate: An Analytical Study

العلاقة بين تقلبات أسعار الفائدة وسوقي: الأسهم والعقار في الأردن - دراسة تحليلية

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Abstract

This paper aims to identify the relationship between interest rate fluctuations, the Jordanian markets of stocks, and real estate in terms of trading volume, the price index of the stock market in general, and the shares of the Jordanian real estate companies listed in Amman Stock Exchange as the Jordanian representative of the real estate market.

The study was conducted on the period of 2000-2008, given the substantial fluctuations in the interest rate that those years witnessed.

Through the use of Pearson's Correlation Coefficient, the study concluded the following: First, there is a positive and strong relationship between interest rate fluctuations and the price index of Amman Stock Exchange. Second, the relationship between interest rate fluctuations and the price index of construction companies is positive with a weak relationship. Third, there is a weak relationship between interest rate fluctuations and the trading volume in the two markets. Finally, Amman Stock Exchange is more sensitive than real estate market to fluctuations of interest rate.

Keywords: Interest rate; stock market; real estate market.

المخلص

يهدف هذا البحث إلى التعرف على العلاقة بين تقلبات أسعار الفائدة، وكل من سوقي: الأسهم والعقار في الأردن، من حيث حجم التداول، والمؤشر السعري العام لسوق عمان المالي من جهة، وأسهم الشركات العقارية المدرجة في سوق عمان المالي للسوق العقاري من جهة أخرى. وقد تم إجراء الدراسة خلال الفترة (٢٠٠٠-٢٠٠٨)؛ لأن هذه الفترة شهدت تقلبات جوهرية في أسعار الفائدة السوقية.

وقد توصلت الدراسة إلى نتائج عديدة من خلال استخدام معامل ارتباط بيرسون، أهمها: أولاً، هناك علاقة قوية وموجبة بين تقلبات أسعار الفائدة والمؤشر السعري لسوق عمان المالي. ثانياً، إن العلاقة ما بين تقلبات أسعار الفائدة ومؤشر أسعار الشركات العقارية إيجابية، لكنها متوسطة القوة. ثالثاً، هناك علاقة ضعيفة ما بين تقلبات أسعار الفائدة وحجم التداول في كلا السوقين. أخيراً، إن سوق عمان المالي أكثر حساسية للتأثر بتقلبات أسعار الفائدة من السوق العقاري.

وقد خلصت الدراسة إلى العديد من التوصيات، أهمها: أن يمارس البنك المركزي الأردني دوره في تقليل تقلبات أسعار الفائدة؛ لأنه ثبت تأثيرها على مستويات أسعار المؤشر وكميات التداول، وعند اتخاذ قرارات الاستثمار والتمويل يجب أخذ علاوة مخاطر تقلب أسعار الفائدة بنظر الاعتبار، وهو التوجه الحديث في قرارات الموازنة الرأسمالية، واتباع إستراتيجية إدارة مخاطر تقلب أسعار الفائدة على أسعار السندات الحكومية والخاصة.

الكلمات المفتاحية: سعر الفائدة، وسوق الأسهم، والسوق العقاري في الأردن.

Introduction:

Interest rates play a significant role in the economic situation of any country due to their effect on commodities and services prices, and on the purchasing power of the local currency. Those impacts normally affect the macroeconomic indicators such as: inflation rates, GDP, and the government debts.

The Central Bank is the responsible body for monitoring and modifying the interest rate taking into account how best this rate serves the country. If there is an increase in the interest rates, most of the depositors tend to increase their savings in banks to improve their incomes. However, higher interest rates lead to higher prices of durable assets, due to the increase in financing costs. Durable assets include: machinery, property, real estate, equipment (Kannan et al; 2012).

The increase in the interest rate would lead to the absorption of part of the cash in circulation in the market to reduce inflation, which is represented by the presence of liquidity in the hands of people in greater amounts than the value of goods and services available in the market. This results in the occurrence of the recession which causes the Central Bank to cut interest rates, prompting depositors hereby to withdraw most of their Savings.

Utilizing the theory of Fisher could be a useful tool to understand the impacts of the fluctuations in interest rates on both the stock and real-estate markets. For, this theory links the inflation rate with the interest rate; that is the nominal interest rate in a country (the actual monetary interest rate earned on an investment) is determined by the real interest rate (R) (the nominal rates less inflation) and the inflation rate (i)

$$(1+Y) = (1+R) (1+I)$$

This research aims to shed light on the role of interest rate fluctuations and their impact on the relationship between stock market and real-estate market. In order to conduct a meaningful study, the researchers have selected deliberately the years from 2000-2008 due to the fact that in this period the interest rates have changed significantly. The researchers contend that this change took place as a result of the global financial crisis that took place in those years. In the years that followed, the interest rate became semi-stable.

2- Problem statement and questions:

The main problem that the paper tackles is based on how fluctuations in interest rates have significant effects on the trade volume and the price index of Amman Stock Exchange, including the prices of construction in Companies Stocks. The questions below are important to address to shed light on the problem presented in this paper:

- 1- Were the fluctuations in interest rates during the studied period substantial?
- 2- What were the effects of these fluctuations on stock prices in general, and the prices of construction companies in particular?
- 3- How were the trading volume and price index of the stock market affected as a result of these fluctuations?
- 4- What was the effect of these outcomes on the trading volume and index of the stocks of construction companies?

3- Research objectives:

This research aims to identify the impact of interest rates fluctuations on the performance of Amman Stock Exchange

represented by the trading volume and prices index. Also it aims to measure the effects of these impacts on the trading volume and price index of construction companies shares listed in Amman Stock Exchange. This measurement sheds light on the effects of these fluctuations on the relationship between the two markets.

4- Research importance:

The importance of this research is based on the fact that interest rates are a key factor in determining the economic situation of the country. They significantly affect the prices of goods, services, and changes of many macroeconomic indicators such as; inflation rates, GDP, and government debts. Moreover, the fluctuations of interest rate have negative/positive effects on the prices of listed shares in the stock market. For in case that interest rates decrease, investors' demand of bank loans increases. This encourages investors to buy stocks and hence leads to an increase in the trading volume and vice versa.

5- Research hypotheses:

This research was conducted based on the following hypotheses:

HO1: There is no statistically significant relationship at ($\alpha \leq 0.05$) between interest rate fluctuation and the general trading volume of Amman Stock Exchange.

HO2: There is no statistically significant relationship at ($\alpha \leq 0.05$) between interest rate fluctuation and general price index of Amman Stock Exchange.

HO3: There is no statistically significant relationship at ($\alpha \leq 0.05$) between interest rate fluctuation and trading volume in Jordanian construction companies.

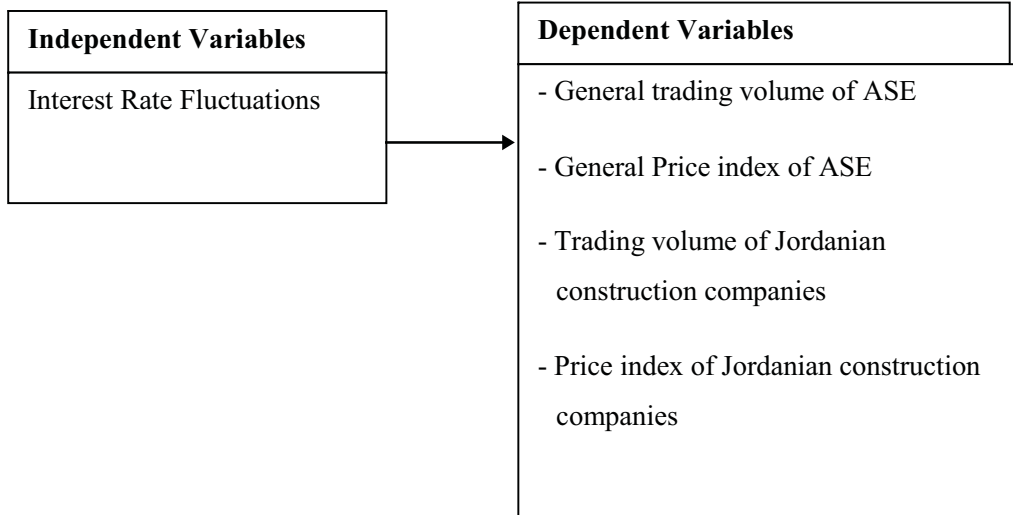
HO4: There is no statistically significant

relationship at ($\alpha \leq 0.05$) between interest rate fluctuation and price index in Jordanian construction companies.

6- The manner and procedures:

After calculating Pearson Correlation Coefficient in the independent variable (fluctuations in interest rates) and each one of the dependent variables (general trading volume, general price index, trading volume of construction companies shares, and price index of construction companies shares), the relationship and mutual effect between the two markets are better clarified

7- Research model



8- Theoretical procedural definition of research variables:

- Trading volume of ASE and the number of shares transacted every day: there is a seller for every buyer (nasdaq.com).
- Price index of ASE number that shows the extent to which a price (or a basket of prices) has changed over a period of time (Business Dictionary).

9- Previous related studies:

9.1: Feng Guo et al., (2011). Markets

Contagion during Financial Crisis: A Regime-Switching Approach.

The main purpose of this research is to identify the mutual effects among the stock market, real estate market, credit default market, and energy market during the years of the occurrence of the global financial crisis. Data were collected through weekly observations on oil price, stock price, CDS index, and housing price index from October 2003 to March 2009. The results of this study showed that the stock market shock and oil price shock were the strongest driving forces behind the

credit default market and the stock market variations. But the surprise was that the impacts from the credit default market on the real estate market were not significant as the researchers expected.

9.2: Hui et al., (2011). «Examining the relationship between real estate and stock markets in Hong Kong and the United Kingdom».

This research aimed to highlight the relationship between real estate market and

the stock market in the United Kingdom and in Hong Kong. The researchers used the data mining method that covers the period from 1993 to 2007. The results showed the expected positive correlation and a consistent movement between the two markets. Such interactions are evidence that there is similarity between these two regions, which can be interpreted by two indicators: wealth and credit effect.

Moreover, the two real estate markets (U.K and Hong Kong) respond in a different way to similar adjustments of the respective stock markets. This can be attributed to their local economic factors.

9.3: Beltaratti et al., (2010) "international house prices and macroeconomic fluctuations." This study aimed to investigate linkages between general macroeconomic situations and the housing market for the G-7 area. The researchers found that the conditions of macroeconomic indicators, the real estate market, and the stock market in the U.S are a significant source of global fluctuations, real activity, nominal variables, stock prices, and real housing prices. They found also that the linkage between real housing prices and macroeconomic developments function in two directions: in investments that generally shows a greater reaction than consumption, and in the output of housing price stocks.

9.4: Jian, yang et al., (2010). "Asymmetric correlation and volatility dynamics among stock, bond, and securitized real estate markets."

The study aimed to determine the link between the daily index returns of the stock market and U.S Mortgage Bond Market and their counterparts in the real estate market. The needed data were

collected from the published information by Real Estate Investment Trusts (REITs) and Commercial Mortgage-Backed Securities (CMBs). The analysis was based on a multivariate asymmetric generalized dynamic conditional correlation model. The results showed that the returns of real estate market respond strongly to asymmetric volatility, and this may lead to reducing hedging potential of REITs against the stock market downturn.

9.5: Guo et al., (2010). "Does "Hot Money" Drive China Real state and Stock Markets"?

This research aimed to discuss the role of hot money or speculative capital inflow on the alterations of China's real estate market and the stock market. The results of the study showed that hot money raised real estate prices, and contributed to speed up fluctuations in both markets due to its massive size and its short-term investment characteristic.

9.6: Simon et al., (2010). "The effect of the real estate downturn on the link between REITs and stock market."

The study aimed to identify the effects of the real estate mortgage crisis, and their impact on the interrelationship between common stock market and the returns on investment in the real state. Data were analyzed according to a flexible mixed-copula approach. The results showed that investing in Real Estate Investment Trust (REIT), before and after the occurrence of the global financial crisis, provides greater protection in the event of severe recession of the stock market in the U.S than in a foreign common stock index. And the current crisis did not have a strong impact on the potential protection provided by REITs.

9.7: Iacoviello et al., (2010). "Housing Market Spillovers: Evidence from an Estimated DSGE Model".

The study aimed to identify the nature of jolts that influence the housing market, and the magnitude of spillovers from the housing market to the wider economy. By using a quantitative model, the researchers developed an estimate using Bayesian Probability approach. Also, by analyzing the related data which represented ten quarterly series including, real consumption, and real residential investment, real business fixed investment, real house, prices, and 3-month nominal interest rate, inflation, and other data, the researchers measured house prices using the quality-adjusted Census Bureau house price index. The results of the study indicated that housing investment falls when housing prices fall relative to wages, and, housing investment falls a lot because the

flow of housing investment is small relative to the housing stocks.

9.8: Tibi, Abdullatif (2010) "Differentiated applications for financing and investment techniques in the Islamic banking business from the perspective of the return and risk"

The study aimed to identify the extent of the impact of interest rate risk on the performance of the portfolio. The study was conducted on Dubai financial market. The main result of this study indicated that higher interest rates in the market compared to the nominal interest rate leads to a decline in stock prices, especially bonds.

10- Methodology:

In this section, the researchers will compute the interest rates fluctuations during the Period 2000-2008. Table No.1 below shows the interest rate and its fluctuations:

Table No.1: Interest rate during the Period 2000-2008 and its fluctuations (Where X represents the fluctuations in the interest rate).

Years	Interest Rate	Interest Rate Fluctuation (X)
2000	6.55	
2001	5.19	- 1.36
2002	3.07	- 2.12
2003	2.75	- 0.32
2004	2.49	- 0.20
2005	3.52	1.03
2006	5.13	1.61
2007	5.50	0.37
2008	5.42	0.08

Source: Central Bank of Jordan (2010) Statistical data, the researchers computed the fluctuations

In order to extract Pearson correlation factor, it is necessary to find the changes in the weighted index and trading volume of Amman Stock Exchange: Table No.2 below shows these data.

Where Y represents the change in weighted index and Z the change in trading volume.

Table No.2: weighted index and trading volume of ASE and their changes

Years	Weighted index	Trading volume (million) JD	Y Change in weighted index	Z Change in trading volume
2000	813.3	33472		
2001	1060.6	66865	247.3	33,393
2002	1090.9	95027	30.3	28,162
2003	1761.5	185517	670.6	90,490
2004	2729.1	373925	967.6	188,408
2005	4259.7	1687105	1530.6	1,313,180
2006	3013.7	1420987	- 1246	- 266,118
2007	3675.0	1234810	661.3	- 186,177
2008	2758.4	2031801	916.6	796,991
			3778.3	1,998,329

Source: Amman Stock Exchange, www.ase.com.jo.

Computation Pearson Coefficient factor fluctuation, the price index, and the trading shows the relationship between interest rates volume, as shown in table No.3 below.

Table No.3: Relationship between fluctuations of interest rates, trading volume, and prices index

Years	X Interest rate fluctuations	Y Changes in weighted price index	(X) (Y)	X2	Y2	Changes in volume	(X) (Z)	Z2
2001	- 1.36	247.3	- 336.3	1.85	61157	334	- 454.2	111556
2002	- 2.12	30.3	- 64.2	4.49	918	281	- 595.7	78961
2003	- 0.32	670.6	- 214.6	0.10	449704	905	- 289.6	828075
2004	- 0.20	967.6	- 251.6	0.06	936250	1884	- 489.8	3549456
2005	1.03	1530.6	1576.5	1.06	2342736	13132	13526	172449424
2006	1.61	- 1246	- 2006.0	2.59	1552516	- 2661	- 4284.2	7080921
2007	0.37	661.3	244.7	0.14	437318	- 1862	- 677.8	3467044
2008	0.08	916.6	73.3	0.011	840165	7970	637.0	63520900
	0.97	3778.3	- 981.2	10.3	6620765	19983	7372.3	251086337

Pearson Correlation Coefficient between the fluctuations of interest rate and the price index amounted to (0.69) and this means a strong relationship between the two variables: “increasing in interest rates meets by increasing in price index,” while the P.C.C between the fluctuations of interest rates and the trading volume of A.S.E equals (0.35), and this reflects a weak relationship between the two variables.

While Pearson Correlation shows relation between interest rates fluctuations, the price index, and trading volume for construction companies listed in Amman Stock Exchange, the available data of construction companies shows that the number of the companies whose stocks traded on the last day in the study years is 31 companies. However, there are 18 companies out of 31 whose data was found after the year 2005. In order to achieve

credibility and reliability, the researchers used the data of 11 companies that have the related data for the years 2006-2008. Table No.4 below shows the relationship between interest rates fluctuations and the performance of the real estate market represented by changes in trading volume and changes in prices.

Table No.4: Person factor for constructions companies

Years	X Changes in interest rates	Y Changes in trading volume	(X) (Y)	X2	Y2	\hat{Y} Changes in Prices	(X) (\hat{Y})	\hat{Y}^2
2006	1.61	500	805	2.59	250000	- 1.37	- 2.21	1.88
2007	0.37	600	222	0.14	360000	- 0.8	- 0.3	0.64
2008	0.08	300	24	0.0064	90000	- 8.7	- 0.7	75.69
	2.06	1400	1051	2.75	700,000	- 10.87	- 3.21	78.21

The relationship between interest rate fluctuations and changes in trading volume indicates a weak relationship (0.29) as shown in Pearson Correlation. Also Pearson Correlation coefficient indicates that there is no relationship between interest rate fluctuations and the prices index of the Jordanian construction companies in the Amman Stock Exchange.

According to the previous analysis, one can observe the following as regards the impact of interest rate fluctuations on the relationship between stock market and real estate market:

Amman Stock Exchange

- Interest rate fluctuations → General Prices index of ASE: strong and positive relationship
- Interest rate fluctuations → General Trading Volume of ASE: Positive and not strong relationship

Real estate market

- Interest rate fluctuations → Trading volume of construction companies: Positive and weak relationship
- Interest rates fluctuations → Prices

index of construction companies: weak relationship

11- Results and Recommendations:

11.1 Results

The results of this research:

- a- Interest rate fluctuations have a strong and positive relationship on the general prices index of A.S.E, which means that an increase in interest rate is accompanied by an increase in the prices index.
- b- There is a positive and moderate relationship between interest rate fluctuations and general trading volume of ASE.
- c- There is a weak but positive relationship between fluctuations of interest rate and the trading volume of construction companies.
- d- There is a weak relationship between fluctuations in interest rate and the prices index of construction companies.
- e- Amman stock Exchange Performance is more sensitive to the changes in interest rates than the real estate market.
- f- Fluctuations interest rates affect the trading volume of both markets.

11.2 Recommendations:

Based on the above analysis, the researchers present the following recommendations:

A- Jordan Securities Commission must issue monthly statistics showing the reasons behind decline in stock prices. .

B- Investors in A.S.E should ignore rumors concerning stock markets.

C- The Central Bank of Jordan should exercise its role in monitoring the interest rate and its effects on the economy, considering that the global financial crisis occurs during the absence of the role of the Federal Reserve in the U.S.A.

D- The study recommends that the Central Bank of Jordan has to determine its role in reducing interest rate fluctuations because of the impact it has on the levels of the index price and trading volumes.

E- Before making finance and investment decisions, interest rate fluctuations must be taken into consideration.

F- The company has to design and implement a risk management strategy to control and avoid interest rate fluctuation.

G- The study encourages more researchers to use different independent variables such as security and government bonds.

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