The Relationship between Interest Rate Fluctuations and the Jordanian Markets of Stocks and Real Estate

An Analytical Study of Amman Stock Exchange and Real Estate Market in Jordan

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Abstract

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

The study was conducted on the years 2000-2008 because these years have witnessed substantial fluctuations in interest rates.

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 medium power. 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 for fluctuations of interest rates.

Key Words: **Interest Rates, Stock Market, Real Estate in Jordan.**

الملخص

يهدف هذا البحث إلى التعرف على العلاقة بين تقلبات أسعار الفائدة وكل من سوقي الاسهم والعقار الاردنيين من حيث، حجم التداول والمؤشر السعري العام لسوق عمان المالي من جهة ، وأسهم الشركات العقارية المدرجة في سوق عمان المالي كممثل للسوق العقاري من جهة اخرى. وقد تم إجراء الدراسة على السنوات من 2000-2008 لأن هذه السنوات شهدت تقلبات جوهرية في أسعار الفائدة السوقية .

وقد خلصت الدراسة إلى النتائج التالية من خلال استخدام معامل ارتباط بيرسون. أولا : هناك علاقة قوية وموجبة ما بين تقلبات أسعار الفائدة والمؤشر السعري لسوق عمان المالي. ثانيا: إن العلاقة ما بين تقلبات أسعار الفائدة ومؤشر أسعار الشركات العقارية إيجابية لكنها متوسطة القوة. ثالثا: هناك علاقة ضعيفة ما بين تقلبات أسعار الفائدة وحجم التداول في كلا السوقين. أخيرا: إن سوق عمان المالي أكثر حساسية للتأثر بتقلبات أسعار الفائدة من السوق العقاري.

الكلمات المفتاحية: أسعار الفائدة، أسواق الأسهم، السوق العقاري في الأردن.

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1- Introduction:

Interest rates play a significant role in the economic arena in any country, because these rates affect in commodities and services prices, and purchasing Power of the currency of the country. Such Impacts normally extended to the macroeconomic indicators such as; inflation rates, GDP, and the government debts.

Inertest rates, as one of the tools of monetary policy in the country, the Central Bank is the responsible power in monitoring and modifying the interest rates taking into account the interest of the country. In the case of increasing the interest rates, most of depositors tend to increase their savings in banks to improve their incomes, but in contrast higher interest rates leads to higher prices of durable assets, due to the increase in financing costs. Durable assets includes; Machinery, property, real estate, equipment (Kannan et al,2012).

The increase in the interest rates would lead to the absorption of part of cash in circulation in the market, so as to reduce inflation, which 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, Causing the occurrence of the recession, then the central Bank to cut interest rates, prompting depositors to withdraw most of their Savings.

In order to provide a deep understanding of the impacts of the fluctuations in interest rates on a both of stock and real estate markets, theory of Fisher could be a useful tool, because it links inflation and interest rates that 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 rates fluctuations and their impact on the relationship between stock market and real estate market.

In order to conduct a meaningful study, the researchers has selected deliberately the years from 2000-2008, where the interest rates have changed sharply during these years, and the researchers believes that this happened because of the occurrence of the global financial crisis during these years, where the interest rates in the later years became a Semi-stable.

2- Problem Statement and questions:

Before the formulation the problem of this research, it is necessary to clarify that the real estate market represented by the stocks of construction companies listed in Amman Stock Exchange. Therefore, this research problem takes the following formula: "Fluctuations in interest rates have significant effects on the trade Volume and the price index of Amman Stock Exchange including the Prices of contractions Companies Stocks". This problem was discussed according to the questions below:

1- Do the Fluctuations in interest rates in the studied period were substantial?

2- What was the effect of these fluctuations on stock prices in general, and the prices of construction companies in particular?

3- How the trading volume and price index of the stock market was affected due to 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 the Amman Stock Exchange represented by the trading volume and prices index, and then to measure the effects of these impacts on the trading volume and price index of construction companies shares listed in Amman Stock Exchange, in order to highlight on the effects of these fluctuations on the relationship between the two markets.

4- Research Importance:

This research has a high importance, because interest rates are a key factor in affecting the economic situation in the country, they have a role in determining the prices of goods and services, and they play a significant role in the changes in many macroeconomic indicators such as; inflation rates, GDP, government debts. moreover, the fluctuations of interest rates have negative / positive effects on the prices of listed shares in the stock market, where in the case of decreasing interest rates, investors demand on borrowing from banks would increase, which causes an increased appetite to buy stocks and thereby increase trading volume and vice versa.

5- Research Hypotheses:

This research was conducted according to the following hypotheses:

HO1: Fluctuations of interest rates do not impact the general trading volume of Amman Stock Exchange.

HO2: Fluctuations of interest rates do not impact the general prices index of Amman Stock Exchange.

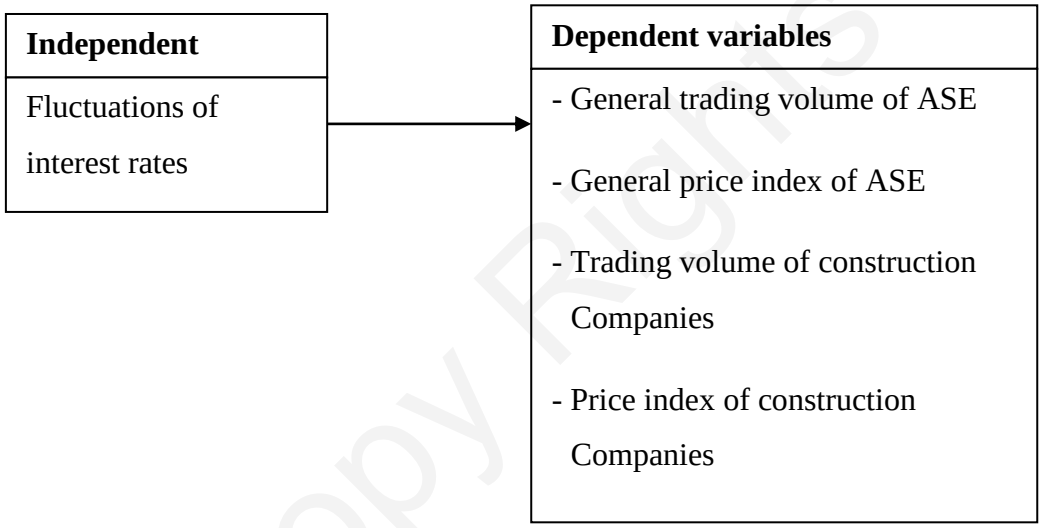
HO3: Fluctuations of interest rates do not impact the trading volume of Construction Companies shares in Amman Stock Exchange.

HO4: Fluctuations of interest rates do not impact the price index of construction Companies shares in Amman Stock Exchange.

6- The Manner and Procedures:

After calculating Pearson Correlation Coefficient between in the independent variable (Fluctuations in interest rates) and each one of dependent variables (general trading volume, general price index, trading volume of construction companies shares, and price index of Construction Companies shares). The relationship between the two markets becomes clear, and how it has affected by the potential results.

7- Research Model



8- Theoretical Procedural Definition of the Research Variables:

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

9- Previous Studies:

9.1: Feng Guo and others (2011). Markets Contagion During Financial Crisis: A Regime-Switching Approach.

The main purpose of this research is to identity the mutual infection 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 and others (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 stock market in the United Kingdom an in Hong Kong. The researchers used the data mining method that covers the period from 1993 to 2007. The results showed not only the expected Positive correlation, but also a consistent movement between the two markets. Such interactions form an evidence on the similarity among these two regions, which can be interpreted by two indicators: wealth effect and credit effect.

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

9.3: Beltaratti and Morona (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 and real estate market and stock market in the U.S are significant source of global fluctuations including real activity and nominal Variables and stock prices and real housing prices. They found also that the linkage between real housing prices and macroeconomic developments functioning in two directions, where investment showing generally a greater reaction than consumption and output of housing price shocks.

9.4: Jian, yang and others (2010). "Asymmetric Correlation and Volatility Dynamics among Stock, Bond, and Securitized Real Estate Markets".

The study aimed to determine the linkage between the daily index returns of the stock market and U.S Mortgage Bond Market with 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 reduce hedging potential of REITs against the stock market downturn.

9.5: Guo and Huang (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 stock market. The results of the study showed that hot money led to rise real estate prices, and contributed the speed up fluctuations in both markets due to its massive size and its short-ter Characteristic, of investing.

9.6: Simon and Lon Ng (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 real state. Data were analyzed according to a flexible mixed-copula approach. The results showed that investing in Real Estate Investment Trust (REITS), 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 a foreign common stock index. And the current crisis did not impact strongly on the potential protection provided by REITs.

9.7: Iacoviello and others (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. And by the analysis of the related data which were represent 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 across the Period 2000-2008. Table No.1 below shows the interest rates and their fluctuations:

Table No.1: Interest rates for the Period 2000-2008 and their fluctuations:
Where X represents the fluctuations in interest rates.

Years	Interest Rates	Fluctuations of interest rates (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	
		- 0.97	

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

In order to compute Pearson correlation factor it is necessary to Compute the change in 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)	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.

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

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

Years	X Fluctuations of interest rates	Y Changes in weighted price index	(X) (Y)	X^2	Y^2	Changes in volume	(X) (Z)	Z^2
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 rates 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 Factor between interest rates fluctuations and the price index and trading volume for construction companies listed in Amman Stock Exchange. Here the available data of construction companies shows that the number of these companies that their stocks traded in the last day in the study years is 31 companies, but there are 18 Company from 31 their data was founded 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 change in prices.

Table No.4: Person factor for constructions companies

Years	X Changes of interest rates	Y Changes in Trading volume	(X) (Y)	X^2	Y^2	$\hat{Y}$ 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	-	90000	- 8.7	- 0.7	75.69
	2.06	1400	1051	2.75	700000	- 10.87	- 3.21	78.21

The relationship between interest rates fluctuation and changes in trading volume indicates to a weak relationship which amounted (0.29) as Pearson Correlation. Also Pearson Correlation coefficient indicates that

there is no relationship between interest rates fluctuations and the prices of the Jordanian Construction Companies in the Amman Stock Exchange.

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

Amman Stock Exchange

- Interest rates fluctuations → Prices index: strong and Positive relationship
- Interest rates fluctuations → Trading Volume: Positive and not strong relationship

Real estate market

- Interest rates fluctuations → Trading Volume: Positive and weak relationship
- Interest rates fluctuations → Prices index: very poor relationship

11- Results and Recommendations:

The results of this research are the following:

a- Interest rates fluctuations have a strong and Positive impact on the general Prices index of A.S.E which means that the increase in interest rates meets by increase in the Prices index.

b- There is a Positive and moderate relationship between interest rates fluctuations and general trading volume.

c- There is a weak but Positive relationship between fluctuations of interest rates and the trading volume of construction companies.

d- There is no relationship between fluctuations of interest rates and the prices index of construction companies.

e- Amman stock Exchange Performance is more sensitive to the changes of interest rates than real estate market.

f- Fluctuations interest rates affect the trading volume of the two markets.

Recommendations:

The researchers present some recommendations to different areas:

A- Jordan Securities Commission must issue monthly statistics about the reasons of stocks prices decline.

B- Investors in A.S.E must ignore rumors.

C- The Central Bank of Jordan must exercise his role in monitoring the interest rates and their effects on the economy. Because the global financial crisis occurs during the absence of the role of the Federal Reserve in the U.S.A.

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