

# The Impact of Macroeconomic Variables on Amman Stock Exchange (ASE) Liquidity Measurements

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## Abstract

The purpose of this study was investigating the relationship between selected macroeconomics variables: money supply  $M_2$ , exchange rate( \$/JOD), interest rate on time deposits and saving deposits, consumer price index, unemployment rate and gross domestic product (GDP) on Amman Stock Exchange (ASE) liquidity measurement. The paper question addressed whether the selected macroeconomic variables were significant effect on ASE liquidity. Liquidity ratios and liquidity turn over ratios used to calculate (ASE) liquidity from (Jan 2012– June 2016). The finding reveled that there was a significant positive relation between  $M_2$  with liquidity measurements. There was a negative significant relation between consumer price index, interest rate on time deposits and liquidity ratios. Investors should study ASE liquidity further more and Jordanian economic changing conditions in order to evaluate their investments' options.

**Keywords:** Amman Stock Exchange (ASE); Macroeconomic variables; Liquidity ratios; Turnover ratios.

## 1. Introduction

Macroeconomic variables are the framework affecting the financial market indicators, which in turn affect the investor's decision to build their financial portfolio. Numerous studies had looked at the relationship between macroeconomic variables and financial market liquidity. This study applied to Amman Stock Exchange using monthly data during period from Jan 2012 till June 2016 (date preparing this study) to find out the impact of macroeconomic variables such as money supply ( $M_2$ ), exchange rate (\$/JOD), interest rate on time deposits and saving deposits, consumer price index, unemployment rate and gross domestic product (GDP) on Amman Stock Exchange (ASE) liquidity.

This study aimed to:

1. State the impact of the macroeconomic variables on liquidity of Amman Stock Exchange (ASE).
2. Provide advice to Amman Stock Exchange investors in light of the economic conditions experienced by the Hashemite Kingdom of Jordan.

### 1.1 Overview of the Jordanian Economy

Table (1) Selected economic indicators between 2012-2016\*

	2012	2013	2014	2015	2016**
GDP(JOD)	21965.5	23,851.6	25,437.1	26,637.4	33,494
GDP annual growth rate %	2.7	2.8	3.1	2.6	2.3
Consumer Price Index	108.87	114.12	117.43	116.4	114.82
change in consumer price index %	4.5	4.8	2.9	-9	-1.4
Unemployment Rate %	12.2	12.6	11.9	12.6	14.7
Weighted average time deposits interest rate %	4.12	4.97	4.11	3.06	2.97
Weighted average saving deposits interest rate %	0.76	.87	.79	.62	.65
Money supply $M_2$	24,945.2	27,363.4	29,240.4	31,605.5	32116.3
Average Exchange rate (\$/JOD)	1.410	1.410	1.410	1.410	1.410

\* Source: Central Bank of Jordan annual reports (2012-2016). Monthly bulletins.

\*\* Till June 2016.

Jordan economy has achieved further improvement in spite of escalated political stability, GDP annual growth rate reached the highest in 2014 to (3.1), consumer price index slowed down to (-1.4) compared to previous years. Moreover the unemployment rate increased to reach (14.7%) because of large numbers of low-paid Syrian workers into labor market, which took over a large portion of newly created jobs in the economy. Market interest rate on deposits declined for both time and saving deposits. Monetary policy was highly flexible to interact with various domestic and external developments to support stability by increasing money supply to reach 32 million JOD.

### 1.2 Amman Stock Exchange Overview

Amman Financial Market was established on March 16, 1977. Went into action and started operation on the 1st of January, 1978. AFM was entrusted with a dual task, namely the role of a Securities and Exchange Commission (SEC) and the role of a traditional stock exchange. On March 11, 1999. Amman Stock Exchange

(ASE) was established, as non-profit organization with legal and financial independence, in charge of running the market. Securities Depository Center (SDC) played the executive role, and the supervisory and legislative role was entrusted to Jordan Securities Commission (JSC). Finally on 26 of March, 2000 ASE started an electronic trading for more efficient market. Table (2) shows selected key statistics of the ASE during (2012-2016).

Table (2) Key statistics of ASE (2012-2016)\*

	2012	2013	2014	2015	2016**
Number of listed company	243	240	236	228	225
Market capitalization(JD million)	19,141.5	18,233.49	18,082.62	17,894.7	16,810.8
Value traded (JD million)	1,978.8	3,027.26	2,263.40	3,417.1	138.7
ASE general weighted price index (point)	4593.6	4336.706	4237.6	4229.9	3946.1
Market capitalization / GDP (%)	93.5	83.0	75.75	70.7	63.1

\*sources: Amman Stock Exchange Annual reports (2012-2016).

\*\* Till: June 2016.

Table (2) shows the decreasing performance of ASE, number of listing company from (243) to (225) till June 2016. Moreover decreasing market capitalization to (16) million JOD in the first part of 2016. Contribution of market capitalization to GDP also shows the decreasing numbers from (93.5%) to (63.1%).

## 2. Literature Review

Liquidity is the life line to financial markets, which is easy to define theoretically and difficult empirically. Even though the expression market liquidity high /low is frequently used (Kurosaki, Kumano, 2015). Gabrielsen and others ( 2011) defined market liquidity as prevailing structure of transactions provides a prompt and secure link between the demand and supply of assets, emphasizing the role of bid – ask spread quotes. Wuyts (2007) defined financial market liquidity as " market is liquid if traders can quickly buy or sell large numbers of shares without large price effects".

Most of literature focuses on the dimensions of financial market liquidity: depth, width, immediacy, tightness and resiliency, in order to measure market liquidity which is globally accepted. Clearly these dimensions interact to gather in order to judge whether the market is liquid or not.

A lot of studies measured financial market using different methodologies measurement like: transaction cost, volume based, price based, market impact measures. Other methods were econometrics techniques such as regressive moving average (ARMA), (ARCH) and (GARCH) in order to evaluate stock market liquidity (Sarr& Lybek 2002)

Kumar and Misra (2015) classified and organized the literature and provide a critical review of the frame works currently available for modeling liquidity and its macroeconomic and firm specific drivers .Alrabadi (2012) analyzed the behavior the day –of day the week regularities and the macroeconomic; she determined aggregate market liquidity of emerging stock market like Amman Stock Exchange and found that major macroeconomics factors significantly affect market liquidity.

Sen and Ghosh( 2008) investigated the relationship between index of industrial production, consumer price index, exchange rate, gold price and money supply with the stock market liquidity, using turnover ratio and liquidity ratio .They established a significant relationship between market liquidity and the selected macroeconomic variables.

Choi and Cook (2005) Steeped drop in the liquidity of Japanese stock market in the post-bubble period and steep rise in liquidity risk. They found that, during Japan's deflationary period, firms with more liquid balance sheets were less exposed to stock market liquidity risk, while slowly growing firms were highly exposed liquidity shocks .Also aggregate liquidity had macroeconomic effects on aggregate through its effect on money demand.

Lu, Glascock (2010) studied the effect of macroeconomic factors on liquidity; the results showed that the growth rate in industrial production has significant predictive power on liquidity pricing when market is in recession.

Quadir (2012), Maudzzaman (2012), Gray (2008), all investigated the relationship between macroeconomic variables such as interest rate, industrial production, consumer price index, exchange rate, money supply, oil price and gold price on stock return. They applied their studies to different markets (Dhaka, Germany, UK, Brazil and Ghana). The findings were close to gather which indicated to significant relationship between macroeconomic variables and stock return.

## 3. Data and Methodology

### 3.1 Data Source

The study depended on Amman Stock Exchange monthly bulletins during the period (Jan 2012-till June 2016), in order to calculate the whole market liquidity using liquidity ratios and turnover ratios. The Last closing price,

closing price, value traded, number of the stock traded, number of issued stocks, value of the transactions and market capitalization used to calculate liquidity ratios and turnover ratios to whole ASE liquidity. The results are the dependant variables.

Jordan Central Bank monthly bulletins and annual reports were used to obtain the macroeconomic factors that affecting ASE liquidity for the same time intervals. These factors are: money supply (MS2), exchange rate (\$/JOD) ,weighted average interest rate on time deposits and saving deposits, consumer price index (CPI), unemployment rate and gross domestic product (GDP). These variables are the independent variables.

### 3.2 Methodology

The main purpose of this research is to examine the macroeconomic variables that affecting ASE liquidity .The first part was calculating liquidity ratios and turnover ratios on monthly bases from Jan 2012 till June 2016. Macroeconomic variables data collected from central bank monthly bulletins.

The second part was calculating liquidity ratios and turnover ratios using ASE monthly bulletins. This paper used the most popular formula calculating financial market liquidity. The analytical expression of the liquidity ratios and turnover ratios for a stock are:

$$LR = \frac{|\% \Delta \text{price change}|}{\text{number of shared traded}} \quad (1)$$

$$LR = \frac{|\% \Delta \text{price change}|}{\text{Value traded}} \quad (2)$$

$$ATR = \frac{\text{Number of stock traded}}{\text{total number of issued stocks}} \quad (3)$$

$$TR = \frac{\text{value of monthly transaction}}{\text{monthly market capitalization}} \quad (4)$$

The following hypotheses were tested:

- 1- There is a no statistically significant relationship between liquidity ratios and macroeconomic variables (consumer price index, money supply 2, gross domestic product, interest rate on time and saving deposits, unemployment rate and exchange rate).
- 2- There is no statistically significant relationship between turnover ratios and macroeconomic variables (consumer price index, money supply 2, gross domestic product, interest rate on time and saving deposits, unemployment rate and exchange rate).

## 4. Empirical Results and Discussions

Deceptive statistic, Person correlation, stepwise methods and ANOVAs were applied to this study in order to test the pervious hypotheses. The following table summarizes the Person correlation between dependent and independent variables:

Table (3) Person correlation

	LR1	LR2	ATR3	TR4
CPI	-0.4301	-.035	-.308	-.176
INT on time deposits	-0.332	-.234	-.065	-.237
INT on Saving deposits	-.048	-.103	.028	.106
MS 2	-.505	-.212	-.037	-.089
exchange rate (\$/JD)	.333	.024	.120	.223
GDP	-.120	-.275	-.093	-.096
Unemployment rate	.142	.088	-.094	-.223

LR= Liquidity ratio1, LR2= Liquidity ratio 2, ATR3 =Turnover 3and TR4= Turnover 4.

Results can be classified as follow:

- 1- A positive relationship between exchange rate and ASE liquidity with the all measurement. Although Jordanian dinar exchange rate is fixed to US dollar.
- 2- A negative relationship between CPI, interest rate on time deposits, MS2 and GDP and all liquidity measurements. Increasing interest rate on time deposits encourage investors to deposit there saving in banks instead of ASE. Increasing GDP and MS2 affects stock exchange liquidity to decrease.
- 3- Conflict results showed that there is a negative relationship between interest rate on saving deposits and liquidity ratios, while a positive relation with turnover ratios.
- 4- Conflict results appeared with unemployment rate. A positive relation featured between unemployment rate and liquidity ratios, and a negative relation with turnover ratios.

Table (4) Entered removed variables

	LR1	LR2	ATR3	TR4
CPI	2	-	1	1
INT on time deposit	3	2	-	-
INT on saving deposit	-	-	-	-
MS2	1	-	-	-
exchange rate (\$/JOD)	-	-	-	-
GDP	-	1	-	-
Unemployment rate	-	-	-	-

Table (4) indicated the most important variables that affect liquidity ratios measurements. CPI is the variable that affects LR1, ATR3 and TR4 most. MS<sub>2</sub> affect liquidity ratio and GDP affecting LR2.

Table (5) ANOVA analysis

	LR1		LR2		ATR3		TR4	
	F	Sig	F	Sig	F	Sig	F	Sig
CPI	13.047	.000	-	-	5.4649	.023	5.4648	.023
INT on Time deposits	11.4609	.000	4.8578	.012	-	-	-	-
INT on saving deposits	-	-	-	-	-	-	-	-
MS2	17.7617	.000	-	-	-	-	-	-
Exchange rate	-	-	-	-	-	-	-	-
GDP	-	-	4.2694	.044	-	-	-	-
Unemployment rate	-	-	-	-	-	-	-	-

Note: significant at 5%.

Tables (5) summarize the following relationships:

- 1- There is a statistically significant relationship between CPI and LR (1), ATR (3) and TR (4). Insignificant relationship with LR (2).
- 2- There is a statistically significant relationship between interest rate on time deposits and liquidity ratios. Insignificant relationship with turnover ratios.
- 3- There is statistically insignificant relationship between interest rate on saving deposits, exchange rate and unemployment rate with all liquidity measurements.
- 4- There is only a statically significant relationship between MS<sub>2</sub> and liquidity ratio (1).
- 5- There is a statically significant relationship between GDP and liquidity ratio (2). Insignificant relationship with others measurements.

## 5. Conclusion

The present study empirically investigated the impact of the selected macroeconomic variables on ASE liquidity. The results suggested that there is a positive insignificant relation between exchange rate and liquidity ratios because of the fixed exchange rate system. Negative relations appeared between CPI, GDP, and interest rate on time deposit. Money supply 2 statistically significant with liquidity ratio (1) and (2). Conflicting results mostly insignificant relation with interest rate on saving deposits and unemployment rate. Investors must study ASE liquidity further more and concern more about CPI, interest rate on time deposit to make their investment options. Jordanian investor must study the affecting political issues in Jordan and region to make their investment decision.

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