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The Effect of Supply Shock and Demand Shock on the Foreign Currencies Exchange Rate Pass – Through to Price Index in Jordan (1990 –2013)

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Abstract
This study aims to identify the variables (supply and demand shocks) affecting foreign currencies exchange rate pass–through to price index in Jordan , over the years (1990- 2013) to determine their effect and transfer to domestic price index.To achieve this goal, the researcher modifying (McCarthy) Model; examining the main hypotheses of the study which is the measurement of the effect of exchange rate pass-through on price index; and partial hypotheses which discusses supply shock (oil prices) and demand shock (money supply) impact on price index.Using VAR model to examine these hypotheses, the results of variance components and impulse response revealed a strong relationship between the movement of foreign currencies exchange rates and the price index in Jordan; and the response of wholesale price index to these movements was greater than the response of consumer price index.The results as well showed a strong and positive effect of demand and supply shocks on the transfer of the movement of foreign currencies exchange rates to price index in Jordan. These effects were stable in first and second period and increased in the next periods. Level of exports concentration, imports composition, difference between domestic and global inflation rates, lack of flexibility of the wages and prices, capital movements, and markets integration; all these had a role in speeding the transfer of exchange rates movements to the price index in Jordan.
Keywords: Exchange Rate Pass Through, Nominal Effective Exchange Rate (NEER), Supply shock, Demand shock, VAR analyses, Auto regression.

1. Introduction

Stable currency exchange rate is fundamental for healthy investment environment, attracting savings, and maintaining prices stability; therefore, the concerned authorities seek to adapt policies that guarantee the stability of currencies exchange rates. This role is even greater in developing countries which suffer from the huge openness in their economies and high deficit in their balance of payments, which make these countries more sensitive to global economic fluctuations and crises; negatively affecting their local stability

It is important to examine exchange rates pass through because the information about the impact transfer is necessary in evaluating monetary policy and their reflection on domestic prices (monetary stability). Moreover, the information about the volume and speed of the exchange rates impact help monetary authorities adopt certain inflation levels, and give important indicators that help in controlling expenditures resulting from such impacts (Lain, 2006).

2. Study Objective:

The researcher aims to measure the pass through of the JD exchange rate against foreign currencies to price and consumption index in Jordan by determining the factors affecting this impact, importance and level of effect of such factors, revealed in the volume and speed of transfer of exchange rate to the local price index. This will determine the efficiency of the current exchange rate system in preventing price increase, attract savings and investments; and will assist monetary authorities to make the appropriate monetary decisions

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3. Study Importance:

In 1989, Jordan adopted economy reform programs and since then significant changes in economic and monetary policies represented mainly in the shift towards open market economies, foreign investment promotion and privatization. This resulted in a series of adverse impacts resulted from external factors as they increased pressures on the Jordanian balance of payments.

These impacts were aggravated due to small volume of Jordanian economy. The index of economic openness, which reflects the ratio of foreign trade to GDP, shows a significant increase as recorded in 2013,(86 % of GDP)that reached (JD20.578 billion), the ratio of imports was66 % of this amount.

The large size of indebtedness, (internal (about JD 13440 million) and external, (JD 723405 billion (86.8% of GDP)), added pressure to volume of accumulated foreign reserves (affected by the change in foreign exchange rates) Also, there is a large credit expansion (JD (18192.6) million, (765% of GDP) affecting the

amount of circulating money leading to imbalanced internal monetary, which reflects an imbalanced external monetary and affects exchange rates (Hindawi, 2000).

Jordan relies heavily on international aid and the foreign remittances of Jordanians working abroad (an indicator of deficit in the state budget); the net current transfers in 2013was about JD (2327.7) million(10% of GDP). This reflects the impact of these cash flows on the balance of payments, (Sedik & Martin, 2006).

4. Study Problem: This study aims to identify the factors affecting the impact of foreign exchange rates on the price index at Jordanian economy. The problem of the study can be summarized by the following questions:
- Is there a relationship between movements of the exchange rates of foreign currencies against the JD and the movements of domestic prices?
- What are the factors that affect the movements of foreign exchange rates reflect on domestic price index? What is the volume and impact of these factors?

5. Study Hypotheses:
In order to solve the problem of the study, the following hypotheses were set up:
The basic hypotheses: The movements in foreign currencies exchange rates affect the price index in Jordan.
To measure the volume of movements and the factors affecting them; i.e. to measure the basic hypotheses, the following sub-hypotheses were derived:
Ha1: The demand shock (change in money supply) affects the impact of the movements of foreign exchange rates on price index.
Ha2: he supply shock (change in oil prices) affects the impact of the movements of foreign exchange rates on price index.

6. Literature Review
The interpretation of the exchange rate variation or the so-called Exchange Rate Pass Through in the literatures is one of the recent economic issues especially in the past two decades of the twentieth century. It can be defined as the relation between exchange rate movements and the adjustment of the prices of purchased commodities, (Eiteman & others, 2004). Exchange rate pass-through depends on micro economic factors such as companies pricing policies; and macroeconomic factors such as inflation levels, and imports composition. This means that the transition mechanism and the volume of its impact will vary depending on the different circumstances of countries and the different economic sectors.

Moreover the literature on this subject could be divided into two directions: The first direction analyzed the impact of exchange rate pass through at a monopolistic environment as literature on this direction focused on the market structure and foreign companies pricing policies, prices' response to the increase, and demand elasticity for import goods. Researchers analyzed the reflection of exchange rates on imports for different commodities and sectors at the micro level,
(Yang, 1998), (Campa, Goldberg, 2005) .
The second direction dealt with the impact of exchange rate pass through at a macro level, using accumulative pricing measures as the interest increased in the impact of macroeconomic conditions, which gave strong indications of the effect of exchange rates reflection on imports' prices, producers and consumers' prices.

Some of the studies focused on the pricing distribution channel to examine the reflection of exchange rates impact on prices within the different stages of goods distribution; i.e. import phase (import price index IPP),and consumption stage (consumer price index CPI);this analysis model is derived from the distribution chain form (Distribution Chain) which was developed by the American economist (McCarthy) where the impact of rate transition is determined by measuring the impact of macroeconomic variables on the indicators of domestic prices within the different stages of pricing and distribution of various goods.

Several studies discussed the effects of exchange rates transition on individual countries as (Guerorguiev, 2003),(Hviding & Antoni, 2004), (Khundratpam, 2007), (Leigh & Marco, 2002). Other studies addressed a group of countries in a comparative study, where a variety of reasons of the exchange rates transition impacts appeared according to the nature of the sample country, and the factors that have been studied as possible causes of the effects of exchange rates transition, as (Gold & Werlang, 2003), (Campa & Goldberg, 2005), (Gagnon & Ihrig, 2004).

Other studies, such as (Taylor, 2000), defined the macro factors affecting the impact of exchange rate transition on domestic price rates. According to these studies, the micro factors were economy volume, economic openness level.

In addition to the imports factor, the foreign real interest rates have an effect on the decline of payments, especially in developing countries where external borrowing is increasing in order to finance the development process. The economic exposure in these countries worsens the impact of external borrowing, making the problem that already exists even bigger. Many countries will be forced to increase the issuance of

cash locally (domestic borrowing) to ease the burden of external debt, which increases the volume of money supply or the volume of domestic demand. This will be reflected on the inflation rate.

The basic rules for monetary policy in open economies emphasize the importance of the effect of interest rates and exchange rates in order to achieve stable price rates. But the emphasis on exchange rates was greater, especially when inflation is targeted at long terms (Ball, 1999).Thus, exchange rate is the main factor of efficient monetary policies, (Fung, 2002).

A review of these studies reveals a focus on the impact of imports factor, (the deterioration of trade exchange terms),exchange rates, foreign remittances, and external borrowing on the macroeconomic variables. The common factor between these that has an impact on countries with open economies is exchange rates; therefore, studying the transition mechanism of the effects of exchange rates will determine the impact of these factors on price index in Jordan.

Mc Carthy assumed that inflation in each of the three phases (import, producers, and consumers) in period (t) includes the following components:

First, expected inflation during that period, based on the information at the end of periodt-1.

Second: the impact of domestic supply and demand shock in period (t)on the inflation in that stage.

Third: the impact of exchange rates shock on inflation at a certain stage, then the impacting earlier stages of the series and finally the shock of the stage itself.

Supply Shock means the events (changes) affecting production capacity and costs. Some of its sources are the increase of oil prices, crops damage or wages changes. While demand shock means the events (changes)affecting the demand for goods and services, and its sources are the increase of government expenditure or the increase of money supply (Bodi & Kane, 2003).

McCarthy considered the shock in each stage as the product of inflation of that stage, which can be interpreted using the information in period t-1 in addition to contemporary information about the domestic supply and demand variables, exchange rates and inflation in the earlier stages of the distribution cycle.

There are two advantages of McCarthy model, first, it allows the shock of import inflation to affect (CPI) inflation directly and indirectly through its effect on(PPI) inflation; secondhand there is no contemporary feedback for this model.

In order to measure the eight variables, McCarthy assumed that exchange rates are to be expressed in nominal exchange rates of the studied countries and through the published data of the International Settlements Bank. The imports prices are measured by the imports price index, the consumers and producers price were measured by the same index which are published in most world countries and with the same mechanism. The production gapis formed after taking the logarithmic deviation of real GDP from linear and square meter. Interest rates were expressed by interest rates for one night which is on loans between commercial banks as published by the U.S. Federal Reserve; the money supply was expressed by the aggregate money supply because it is stable and represents domestic liquidity.

Thus, McCarthy model contains eight key variables; imports, consumer price index CPI, PPI, supply shock (oil prices), demand shock (production gap), exchange rates shock, short-term interest rates, and the growth in the money supply.

The McCarthy model was applied in the industrial countries; the researcher will modify this model to meet the characteristics and macroeconomic variables for small countries with open economies. Defining the key variables of the Jordanian economy would be the first step to a modified VAR model.

The following issues form the most important features of Jordan economy

first; there is a permanent deficit in Jordan trade balance. Oil is most important import that deepens the impact of the deficit as a result of continues increase foil prices, (imports of oil JD 4068.892 million (26 % of total volume of imports and 37 % of total deficit of trade balance)).The study will adopt oil prices to express the external shock (supply shock), (Gueorguiev, 2003), (Khundrakpam, 2007).

Second, there is an increase in money supply, causing an increase in domestic demand (demand shock). It is noted that the money supply was increased during the last years resulted in monetary increase, which transfers the impact of exchange rates movements to domestic prices, (Al-Ali, 97), (Balmier, Bonito, 2002).

Thus, study model based on the following variables: oil price (supply shock), money supply(demand shock) (m), real exchange rate (REER) compared to the USD exchange rate, wholesale price index (WPI), and consumer price index (CPI).

These five factors are expressed in this study through the following equations:

$1\text{-}\pi_t^{oil} = E_{t-1}(\pi_t^{oil}) + \varepsilon_t^{oil}$

$2\text{-}\pi_t^{m} = E_{t-1}(\pi_t^{m}) + \alpha_1 \varepsilon_t^{oil} + \varepsilon_t^{m}$

$3\text{-}\pi_t^{e} = E_{t-1}(\pi_t^{e}) + \beta_1 \varepsilon_t^{oil} + \beta_2 \varepsilon_t^{m} + \varepsilon_t^{\Delta e}$

$4\text{-}\pi_t^{WPI} = E_{t-1}(\pi_t^{WPI}) + \gamma \varepsilon_t^{oil} + \gamma_2 \varepsilon_t^{m} + \gamma_3 \varepsilon_t^{\Delta e} + \varepsilon_t^{WPI}$

$5\text{-}\pi_t^{CPI} = E_{t-1}(\pi_t^{CPI}) + \delta_1 \varepsilon_t^{oil} + \delta_2 \varepsilon_t^{m} + \delta_3 \varepsilon_t^{\Delta e} + \delta_4 \varepsilon_t^{WPI} + \delta \varepsilon_t^{CPI}$

Where the symboles (π_t^{oil} ، π_t^{m}، π_t^{e} ، π_t^{WPI} ، π_t^{CPI}) represent oil prices, money supply, exchange rates, wholesale

price index , and consumer price index , respectively.
(.) E_{t-1}) is the expected value of the variable (.) In the previousperiod t-1
(α ، β ، γ ، δ)are parameters.
(ε_t^{oil} ، ε_t^{m} ، $\varepsilon_t^{\Delta e}$، ε_t^{WPI} ،ε_t^{CPI}) represent supply shocks (oil), demand (m), exchange rate (e) and wholesale price index (wpi), consumer price index (cpi) , respectively.

7. Statistically Treatments: In order to examine the hypothesis, VAR model is applied, a modern standard model that studies the relation between macroeconomic variables, in which each variable is written as a linear function with the value of the variable itself in previous periods. All variables in this model are considered as endogenous variables determined within the model and not outside it (the model solves the internal problem, which means there is no internal adjustments to prices accompany exchange rates changes), (Almajali,2003), (McCarthy, 2000).VAR analysis helps identifying the structure of the shock that affects the distribution chain and not only price tendencies (Faruqee, 2004).

Oil prices, the change in money supply and the change in exchange rates are expressed by the natural logarithm, the standard price index of producers and consumers are expressed by their average rates, period (t) will be annually.

To apply VAR model analysis, the following has to be tested: unit root, number of chronological slowdown periods, the causal and differential components analysis, and response function of reaction (AL-Majali, 2003).

8. Study Results:

8.1 Unit root test of time chains variables' stability: the aim of studying variables' stability is to examine their logical relationship. If they are stable then the relationship is logical. Otherwise, the relationship is false. Stability is measured by the relative stability in the standard deviation and the average of a certain variable during different periods of time. If the difference between the average and standard deviation of a variable during different periods of time is small, then this variable is relatively stable.

The time series stability tested by using (Dickey - Fuller) test, by comparing the table value to calculated (T) value When the tabular value is greater than calculated (T) value(in absolute terms),then the variable is not stable and vice versa.

Table (1):The results of Dickey - Fuller stability test

Result	Table T value	Calculated T value	Variable
Stable	1.725	-4.498	LNCPI
Stable	1.725	-4.467	LNEX
Stable	1.725	-3.788	LNM-OIL
Stable	1.725	-3.788	LNIPTT
Stable	1.725	-3.788	LNM2
Stable	1.725	-3.831	LNNEER
Stable	1.725	-4.498	LNREER

From table [1](1), all the data in this study are stable at level 1, after subtracting the current value of the variable from the previous value. The stability of variables was decided ((Mc Clav &, Benson, 1988) by comparing the calculated value of (T) (in absolute terms) with table value (in absolute terms) from the null hypothesis which originally assumes instability of variables, hence the time series variables in this study are fully integrated

8.2 The Lag Length Selection Test:

Lang-length is measured by the period in which a variable affects another variable. It is determined by answering the following question: How much is the effect of a variable on another variable delayed?

There are no specific criteria for measuring the ideal lag length, but the less time the better. Usually researchers seek guidance by comparing the results of lag length in their studies with other similar studies. To find the ideal number of Lag length in this study model, Akanke Information Criterion (AIC) has been adopted. In order to determine the ideal number of lag length, the least value of (AIC) is chosen, which meets the ideal lag length. Referring to the statistical data it was found that the lowest value of (AIC) was -3.232913 where the lag length was (2).

[1]- Abbreviations in Tables indicate:(CPI): consumer price index, (EX): nominal exchange rate of the JD, (M-OIL): oil prices, (IPTT): wholesale price index, (M2): money supply, (NEER): nominal effective exchange rates of the JD, (REER): real effective exchange rate of the JD.

8.3Causality test

In order to determine causality direction, Granger causality test is usually used, which determines causality between the study variables, i.e. exchange rates, consumer price index, wholesale price index, and oil price and money supply.

The relationship can be either unidirectional where one of the factors affects other factors without being affected by them, or a reciprocal relationship where all factors affecting each other with no causal relationship between them.

In order to determine the causal relationship based on the attached statistical data, calculated F value is compared to table F value. If the calculated F Value is greater than table F value, that means there is a causal relationship between the variables. If calculated F value is less than table F value, it means there is no relationship between the variables. When Granger causality test was applied, results were as follows:

Table (2) Granger CausalityTest

Causality	Table F Value	Calculated F Value	Causality Direction
Granger Cause	1.717	3.749	NEER ← M2
No Granger Causality	1.717	0.205	M2 ← NEER
Granger Cause	1.717	2.526	NEER ← CPI
No Granger Causality	1.717	0.669	CPI ← NEER
No Granger Causality	1.717	1.694	NEER ← M-OIL
Granger Cause	1.717	3.852	M-OIL ← NEER
No Granger Causality	1.717	1.645	NEER ← IPTT
Granger Cause	1.717	3.166	IPTT ← NEER
Granger Cause	1.717	1.855	M2 ← CPI
No Granger Causality	1.717	1.067	CPI ← M2
No Granger Causality	1.717	0.855	CPI ← N-OIL
No Granger Causality	1.717	0.085	M-OIL ← CPI
No Granger Causality	1.717	0.739	M2 ← M-OIL
No Granger Causality	1.717	0.218	M-OIL ← M2
Granger Cause	1.717	43.825	M2 ← IPTT
Granger Cause	1.717	1.933	IPTT ← M2
No Granger Causality	1.717	0.243	CPI ← IPTT
Granger Cause	1.717	5.949	IPTT ← CPI
No Granger Causality	1.717	0.717	M-OIL ← IPTT
No Granger Causality	1.717	0.753	IPTT ← M-OIL

8.4 Variance Components Analysis Using the Effective Nominal Exchange Rates

The variance analysis is used to determine the forecasting variance which refers to the forecasting error in the variable itself and the forecasting error of the other explanatory variables in VAR model. The variance analysis of a certain variable measures the amount of change in that variable, which is caused by the change in the variable itself; and the amount of change in other variables caused by the change in other variables in the model (Walter, 2004).

The test results were as follows:

8.4.1 A – Variance Components Analysis of Nominal Effective Exchange Rates (NEER)

Table (3)Variance Components Analysis of (NEER)

Period	NEER	M2	CPI	M-OIL	IPTT
1	100.00	0.00	0.00	0.00	0.00
5	91.02	0.49	4.22	0.29	3.95
10	89.09	0.74	5.39	0.30	4.45

This result in table (3), shows that the change(forecasting error) in(NEER) of the JD in the first period, which was(100%), was due to the variable itself while the decrease of this ratio in the fifth period, which reached (91.0%) and about(4%)was due to the variables CPI, PPI. It is noted that this ratio decreased in the tenth period by the same decrease average of the fifth period.

8.4.2 B-Variance Components Analysis of Money Supply(M2)

Table (4) -Variance Components Analysis of Money Supply (M2)

Period	NEER	M2	CPI	M-OIL	IPTT
1	34.05	65.95	0.00	0.00	0.00
5	34.45	23.33	4.78	6.36	31.06
10	61.95	17.81	2.31	5.43	12.46

(Table 4)shows that when the components variance of money supply (M2) was analyzed, about (66 %) of the forecasting error of the variance in the first period was due to the variable itself , while (34%) was due to nominal exchange rates. However, the first ratio begins to decrease to reach (23 %)in the fifth period, and (17%) in the tenth period. At the same time, percentage of change caused by nominal exchange rates kept increasing to reach (62%)in the tenth period. This increase implies strong effect of nominal exchange rates over money supply.

8.4.3 C–Variance Components Analysis of Consumer Price Index (CPI)

Table (5) Variance Components Analysis of Consumer Price Index (CPI)

Period	NEER	M2	CPI	M-OIL	IPTT
1	68.89	1.84	29.26	0.00	0.00
5	84.83	4.52	9.00	0.03	1.60
10	86.01	5.46	5.69	0.43	2.38

(Table 5) shows that (29%) of the forecasting error in CPI index variance in the first period was due to the variable itself, while (69%)was due to the nominal exchange rate of the JD. This reinforces the hypothesis of the study that there is a relationship between exchange rates and domestic price index.

In the fifth and tenth periods, the effect of nominal exchange rates increased to reach (85%) and (86 %), while the effect of the variance error decreased to(9%) in the fifth period and (6 %) in the tenth period.

8.4.4 D - Variance Components Analysis of Oil Prices (M-OIL)

Table (6) Variance Components Analysis of Oil Prices (M-OIL)

Period	NEER	M2	CPI	M-OIL	IPTT
1	24.33	14.83	18.49	42.30	0.00
5	24.80	22.66	16.71	33.45	2.35
10	27.24	25.00	13.37	32.66	1.70

It is noticed from the results of Table (6) that 42 % of the variance error (M-OIL)in the first period was due to the variable itself, while 24% resulted from nominal exchange rates, 15% from money supply, and 19% from consumer price index. It is noted as well that the variance error of oil prices decreased to reach 33% in the fifth period, and stabilized in the tenth period. The forecasting error of money supply increased, it was 23% in the fifth period and 25% in the tenth period. The forecasting error of nominal exchange rates reached 27% in the tenth period although it was stable during the fifth period at the same rate of the first period. The effect of decreasing variable CPI percentage dropped to 17% in the fifth period and (13%) in the tenth period

.**8.4.5 E**–Variance Components Analysis of Wholesale Price Index (IPTT)

Table (7) Variance Components Analysis of Wholesale Price Index (IPTT)

Period	NEER	M2	CPI	M-OIL	IPTT
1	9.31	1.67	2.29	2.12	84.58
5	25.09	2.67	12.70	1.65	57.87
10	28.06	2.54	13.93	1.83	46.2

In (Table 7), it is noted that (85 %) of the forecasting error of wholesale price index during the first period was due to the variant (IPTT) itself, while (10 %) was caused by nominal exchange rates variant. It is also noted that the impact of nominal exchange rates variable increased to 25% in the fifth period and 28% in the tenth period, while the forecasting error of the same variable decreased to (58%) in the fifth period and (46 %) in the tenth period. In order to ensure the credibility of the study results, variables were arranged according to the Cholaski distribution, which is used to avoid the problem of covariance of the different variables in the model (Walter, 2004).

8.5 Impulse Response Function Analysis:

To keep track of the time paths of the different and sudden shocks of the variables in the VAR model, impulse response function analysis is used. It reflects how these variables respond to such shocks and help clarify how a certain variable responds to a random shock of one standard deviation in the same variable, or in another variable

in the model. When this test was applied, the results were as follows:

A - Money Supply (M2) Response (Demand Shock):

Figure 2 in the Appendix shows impulse response of money supply to a random shock of one standard deviation of (NEER). It is clear from Figure (2 - A) in the Appendix that the impact of nominal exchange rates on the money supply was negative in the second and third periods, then this effect increased positively in the third and six periods, then relatively stabilized until the end of the tenth period.

This means that any random shock in (NEER) has an immediate increasing positive effect upon money supply in most periods of the study. The impulse response appears at the beginning of the second period, which implies an early response. This supports the study hypothesis that there is a relationship between currency exchange rates movements and demand shock.

B - Oil prices Response M-OIL (Supply Shock).

The figure (2-B) in the Appendix shows oil price response to a random shock of one standard deviation in the nominal exchange rates of the JD. It is clear that the impact of nominal exchange rates on oil prices had a positive growing impact in the first period, and then begins decreasing in the second and third period. It rises again in the fourth period until the tenth period. This means that any random shock in (NEER)has a direct and positive effect on oil prices in most periods of the study. This supports the hypothesis of the study that there is a relationship between currency exchange rates movements and the supply shock.

C –Consumer Price Index Response (CPI):

Figure (C-3) in the Appendix shows the response of CPI to random shock of one standard deviation in (NEER) of the JD. The impact was stable in the second period, and then began to rise throughout the remaining periods. There was an early impulse response that started in the second period. This means that any random shock in the (NEER) of the JD positively affects, throughout the study periods. This supports basic theory of the study that there is a relationship between the movements in the exchange rates of foreign currencies and price index.

D –The Response of Wholesale Trade Price Index (IPTT):

Figure (4 - D) in the Appendix shows the response of (IPTT) to a random shock of one standard deviation in (NEER) of the JD. It is clear that the effect of the response was stable throughout the first and second periods, to decrease until the fifth period, and then it began to increase again until the end of that period.

The response appeared since the beginning of the second period. The response of (IPTT) function supports the study hypothesis that there is a relationship between the movements in the exchange rates of foreign currencies and the price index.

Hypotheses Test:

9. The basic hypothesis: After testing this hypothesis, the results were as follows:

A - When Granger causality test was applied, the impact of the (NEER) reflected the relationship between the nominal exchange rates of the local currency and the nominal exchange rates of commercial partners. The result was a causal relationship between the nominal exchange rates and wholesale price index, which is a unilateral relationship where (NEER) affected wholesale price index, while the wholesale price index had no effect upon (NEER). As for the relationship between (NEER) and consumer price index, the result shows causal relationship that is unilateral as well where (NEER) affects consumer price index but not vice versa.

B - When the variance components of the consumer price index were analyzed, the results showed that about 69 % of its variance forecasting error was due to the (NEER) variable.

C - When the variance components of wholesale price index were analyzed, the statistical results showed that the (NEER) was the main variable that affected the interpretation of the variance error of the wholesale price index. The impact of this variable increased from about 10% in the first period to reach about 28 % in the tenth period, with limited impact of other variables.

When analyzing the response of (CPI) to a random shock of one standard deviation in(NEER), the analysis showed that there is a positive increasing impact throughout the period of study. There was an indication that the index showed a direct impulse response

D–Analysis of impulse response of wholesale price to a random shock index of one standard deviation in (NEER) of the JD, the results showed that there is a limited impact during the first and the second periods of the study, then it began to positively increase from the beginning of the fifth period until the end of the study period. The results also showed that it was a quick response as well. Reviewing the statistical results of the first basic hypothesis, it is clear that all of these results, with the exception of the analysis of the causal impact of nominal exchange rates to the consumer price index, support and prove the a strong relationship between the movements in foreign exchange rates and the price index. These results agree with studies of (Lian, 2006),(Khundrakpam, 2007), (Choudhri, Hakura, 2001), (Leigh, Rossi, 2002) and (Belaisch, 2003).

Although these studies did not agree on the volume of the impact transition, they agreed that there is a reflection of the movements in foreign currencies exchange rates versus the national currency on the domestic price indexes in those countries.

These findings are consistent with the (purchasing power parity) theory, which assumes that the increasing volume of trade of a country with other countries, under the fluctuating nominal exchange rates of their currencies, leads to higher or lower exchange rates of these currencies. The aim of examining this hypothesis in Jordan (assuming that Jordan economy is a small and open economy) was to determine the amount of the reflection and the limits of the relationship. In order to measure the limits of the relationship, the response function analysis showed a direct and positive impact of the consumer price index throughout the study periods, except for the first and the second periods for; and a relative stability in the first and the second periods with a decrease until the fifth period, and then another increase of the wholesale price index following periods.

Researcher attributed the relative stability of the (CPI) in the first and the second periods to the administrative pricing policies of goods in those periods, which means a relative protection of the consumer index from receiving price increase shocks resulting from fluctuations in foreign exchange rates.

The Economic theory assumes that part of the limited response of the (CPI) may be due to the availability of alternative goods, or a low level of predicting a continuing recession, which kept the pricing policies fixed along the pricing and distribution chain. While there is a low level of substitution between domestic and foreign goods in Jordan and the existing political situations surrounding Jordan raise the levels of pessimism and not optimism. This result is consistent with (Billmeier, Bonato, 2002) where the researcher stated that the pricing of many commodities affected the reflection of movements in exchange rates on price index. Moreover, the protection was the cause of a realistic effect on the wholesale price index. The positive rise in the indicators response was due to the Jordan adoption of economic openness and liberalization of the market.

Despite of the fluctuations increase the (NEER), trade liberalization and the reduction of tariffs of many import goods absorbed the impact of the high fluctuations e rates, resulting in a relatively high response of wholesale price index; a result agrees with (Leigh, Rossi, 2002).

The impact clearly appeared in the impulse response analysis, which was evident in the third and fourth periods, a time of depreciation of the JD. This result agrees with (Choudhri, Hakura, 2001), and (Taylor, 2000),which assumes that the effect of exchange rates reflection is more influential in inflationary systems.

Although some studies have indicated that the difference between the reaction of import prices index and consumer price index shows the ability of the distribution system parties to determine the price, such as (Faruqee, 2004); however, caution must be exercised in the interpretation of this result, because of the lack of clarity and ability to distinguish between the distribution chains, and because some importers adopt a continuous distribution chainpolicy.

Ho1: Hypothesis Testing: Demand shock (money supply) affects the transition of the impact of foreign exchange rates movement to price index in Jordan.

A - Granger causal test results showed that there is a causal relationship between money supply and wholesale price index, and that it is a reciprocal relation where each of these variables affects the other; while the relationship between money supply and (CPI)is a unilateral relationship where (CPI) affects money supply, and money supply does not affect the (CPI).The increase, with the passage of time, indicates the power of nominal exchange rates impact on the money supply.

B - When analyzing the response of the money supply to a random shock of one standard deviation in nominal exchange rates (NEER), there was an early and positive impact throughout the study period. Reviewing the statistical results of the first sub- hypothesis, there was relationship between cash shock (money supply) and the transition of the impact of exchange rates movements on price index.

As for factors causing (NEER)fluctuation, it's found, that the prediction error in this variance was mainly due to the nominal exchange rates by 34% in the beginning of the period and (62%) at the end of the period. This result is consistent with the results of (Bhattacharya, 2003). This supported as well by other factors such as the increase of foreign deposits in the Jordan which caused greater response of price index to exchange rates fluctuation; a result consistent with (Leigh, Rossi, 2002),and (Billmeier, Bonato, 2002), where high level of dollarization caused currency fluctuation. Some studies discussed the role of the reserve management policy and the external public debt management on currency exchange rates fluctuations, to mitigate their effect upon domestic price rates as in (Hviding, Nowak, Ricci, 2004).

The researcher believes that the monetary authorities succeeded dramatically since the beginning of the nineties of the last century in managing the reserves and external public debt to achieve economic objectives, and thus reduced the fluctuations in the nominal exchange rates. The JD was stable against the USD since the 1995, which contributed effectively in the relative price stability level.

(Tahsin, Petri, 2006) found that the impact of remittances and grants on the fluctuation of (NEER) against the currencies of the conversion currency and the increase in remittances match the impact of the increase in foreign deposits and the high level of dollarization on domestic price levels .

Ho2: Hypothesis Testing: Supply shock (oil shock) affects the transition of the impact of foreign exchange rates movements to price index in Jordan.

A - When Granger test was applied, the results showed no causal relationship between oil prices and the

consumer price index, and vice versa; and there is no causal reciprocal relationship between oil prices and the wholesale price index.

B - Analyzing the variance components of oil prices, the results showed that the variable responsible for interpreting its prediction error was nominal exchange rates, for about 25% in the first period, 25 % in the fifth period and about 28 % in the tenth period. This variable was the highest throughout the three periods.

C - When analyzing the impulse response of oil prices to a random shock of one standard deviation in (NEER), the results showed that (NEER) had a strong positive rising effect on oil prices throughout the study periods. The early response is an evidence of a coincident influence of exchange rates movements on oil prices.

Reviewing the statistical results of theHo2, it is clear that all of these results support and prove the existence of a correlation between the impacts of supply shock on the transition of foreign exchange rates movements to price index.

The researcher believes that the optimistic predictions of oil prices during most of the study periods reduced the impact of the reflection of shock supply on the CPI. As a result, Jordan received grants and oil concessions from neighboring countries which reduced the impact of this variable. Moreover, when the government held part of the oil bill to support various economic sectors until the past four years of the study, played a significant role in reducing the reflection of oil prices on the consumer price index. This indicates that (NEER) are an important tool to deal with the demand and supply shocks in Jordan economy.

This result agrees with the findings of (Bhattacharya, 2003) and (Khundrakpam, 2007) which assumed that monetary shocks require exchange rate management as an important means to reduce the impact reflection.

Although this result indicates, that flexibility of wages and prices concentration of import commodities (oil prices) reinforces the hypothesis that the influence of the fluctuation in (NEER) on the transition of oil prices variable impact the domestic price index. This result consistent with (Lian, 2006), (Khundrakpam, 2007) study, which concluded that the changing trends in import goods towards certain goods such as fuel and food contributed to the increased transfer of exchange rates movements and their impact. (Leigh, Rossi, 2002) discussed the impact of the phenomenon of oligopoly on the reflection of nominal exchange rates movements to price indexes. It is noted that the difference in interpreting the prediction error of variables is sometimes due to the different variables in the study periods.

Referring back to the results of this study, the researcher believes that the impact of this phenomenon was limited, as the response of wholesale prices index was greater than the response of the consumer price index, which means that the importers have absorbed part of the movements in the exchange rates, so they did not have enough power to form an oligopoly and thus control prices.

References

1- AL Ali, Adel Mohamed Ali, (1997), "The Effect of Jordanian Exchange Rate on Microeconomic Variables", Master Thesis, Jordan University

2. AL Majali, Ahmad Abed Alkader, (2003), "The Effect of Banking Credit on Jordanian Economy Activity (1970-2000), VAR Model", Master Thesis, Muath University

3 - Ball Laurence, (1999). " Monetary Policy Rules ", Symposium by National Bureau of Economic Research, edited by J.B. Taylor, Chicago University

4 - Belaisch Agnes,(2003), " Exchange Rate Pass – Through in Brazil ", Working Paper, No 03/141, IMF, Western Hemisphere Department, USA.

5 - Bhattacharya Rina,(2003)," Exchange Rate Regime considerations for Jordan and Lebanon", Working Paper, No 03/137, IMF, Middle Eastern Department, USA.

6 - Billmeier, A. and Bonato L.(2002), "Exchange Rate Pass- Through and Monterey Policy in Croatia", Working Paper, No 02/109, IMF European Department, USA.

7 - Bodi, Zvi, Kane Alex, and Marcus, Alan J., (2003), Essentials of Investments, 5th Ed, McGraw – Hill, USA.

8 - Choudhri, E. V., and Hakura D. S., (2000) " Exchange Rate Pass-Through to Domestic Prices: Dose the Inflationary Environment Matter?"Working Paper, No 01 / 194 IMF Institute.

9- Eiteman David, Stone hill Arthur, and Moffet Michael H., (2004), Multinational Business Finance, 10th ed., Pearson Addison Wesley, USA, 2004.

10 - Faruqee, Hamid,(2004), " Exchange Rate Pass – Through in the Euro Area: The Role of Asymmetric Pricing Behavior ", Working Paper, No 04/14, IMF, European Department.

11 - Fung, B. S C, (2002), " AVAR Analysis of the Effects Monetary Policy in East Asia ", Working Paper, No 119, BIS publication, Switzerland.

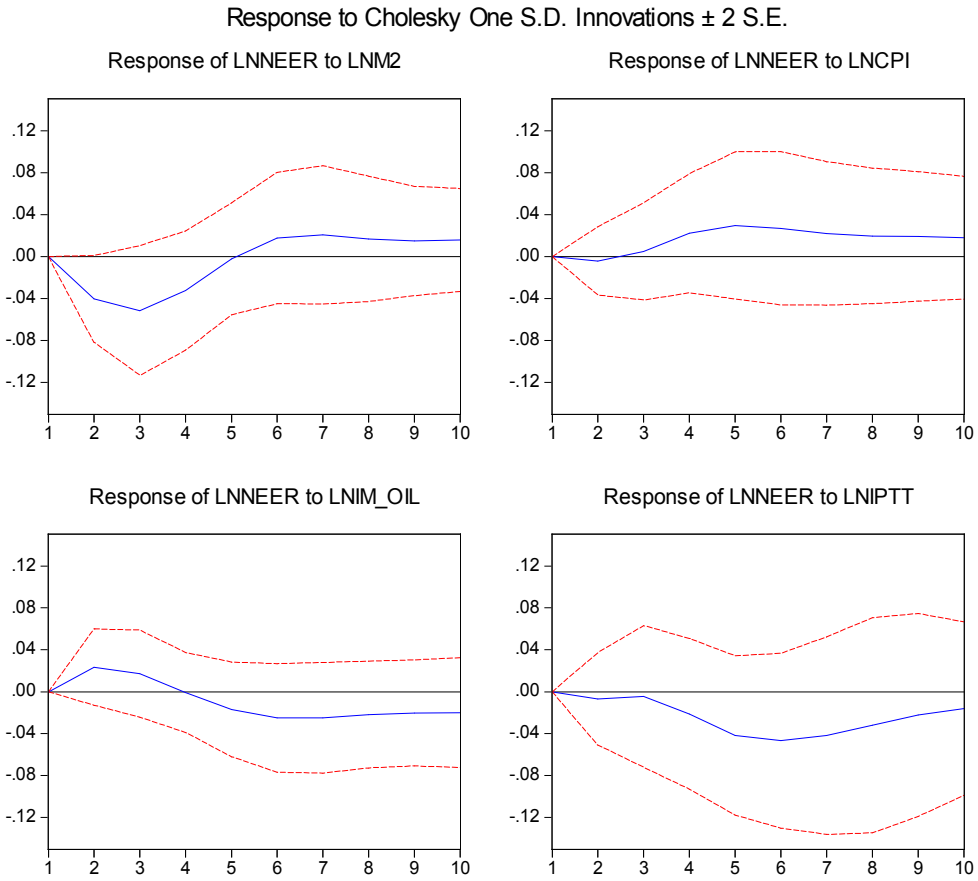
12 - Gagnon, J E and Ihrig, J(2004), “Monetary Policy and Exchange Rate Pass – Through, “Board of Governors of the Federal Reserve System, International Finance Discussion Paper no 704.

13 - Gold, F, and Werlang, S.R.C., (2003), “The Pass – Through from Depreciation to Inflation“Banco Central de Brazil, Working Paper, No 5.

14 - Guerorguiev, Nicolay,(2003), " Exchange Rate Pass – Through in Romania' 'Working Paper, No 03/130

IMF, European Department, USA.
15- Hindawi, Hatem Faour Kasem, (2000), "Monetary Mechanic Transition Effect at Jordanian Economy," Master Thesis, Jordan University.
16 - Hviding, K., Nowak, M., and Ricci Luca Antonio, (2004), " Can Higher Reserves Help Reduce Exchange Rate Volatility?" Working Paper, No 04/189, IMF, Research Department, USA.
17 - Khundratpam Jeevan Kumar,(2007) " Economic Reforms and Exchange Rate Pass – Through to Domestic Prices in India ", Working Paper, No 225 BIS press, Switzerland, 2007
18 - Leigh Denial and Rossi Marco, (2002), " Exchange Rate Pass – Through in Turkey ", Working Paper, No 62/204, IMF, European department,USA.
19 - Lian an, (2006), " Exchange Rate Pass – Through: Evidence Based on Vector Auto regression with Sign Restrictions " MPRA publication.
20 - McCarthy, J., (2000), "Pass-Through of Exchange Rate and Import Prices to Domestic Inflation in Some Industrialized Economies", Federal Reserve Bank of New York, USA.
21 - McClav James T, Benson P. George, (1988), Statistics for Business and Economics, Dellen Publishing Company, 4th Ed, USA.
22 - Sedik Tahsin Saadi- and Petri Martin,(2006),"To Smooth or Not Smooth – The Impact of Grants and Remittances on the Equilibrium Real Exchange Rate in Jordan", Working Paper, No 06/257, IMF, Middle East and Central Asia Department, USA
23 - Compa, J.M, Goldberg, L.S.," (2005), Exchange Rate pass – through in to Import Prices, "The Review of Economics and Statistics,.
24 - Taylor, J.B, (2000), "Low Inflation Pass – Through, and Pricing Power of Firms, "European Economic Review.
25 - Walter, Enderi, (2004), Applied Econometric Time Series, 2ndEd, Wiley.
26 - Yang J.W, (1998), "Pricing – to – Markets in U.S Imports and Exports: A Time – Series and cross – Sectional study, "The Quarterly Review of Economics and Finance.
27 – Central Bank of Jordan, Monthly Bulletin, Research Department, Vol. 10, No. 3, 2014

2-A up to left …….2-B up to right
2-C down to left……..2-D down to right



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