CONSUMER PRICE INDEX (CPI) AS A COMPETITIVENESS INFLATION MEASURE: EVIDENCE FROM JORDAN

Osama Samih Shaban [*], Mohammad Al-Attar [**],
Zaid Al Hawatmah [**], Nafez Nimer Ali [**]

* *Corresponding author,* Faculty of Business, Al-Zaytoonah University of Jordan, Amman, Jordan
Contact details: Faculty of Business, Al-Zaytoonah University of Jordan, Amman, Jordan
** Faculty of Business, Al-Zaytoonah University of Jordan, P.O. Box 130, 11733, Amman, Jordan

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Abstract

The purpose of this paper is to investigate the Consumer Price Index (CPI) as a competitiveness inflation measure and to determine whether an empirical relationship exists between the rates of inflation represented in CPI and the level of the real exchange rate. In order to achieve the objectives of this paper, the study calculated the consumer price index (CPI) as an inflation rate for the period 2010-2018, and also adopted the real exchange rates for the same period. In order to achieve the objectives of the study, a Pearson correlation analysis between the average CPI rates, and the average exchange rate were conducted. The outcomes of the correlation analysis conducted reflect a negative correlation of 62% between the exchange rates and the CPI's inflation rates, which means that when CPI rates cause direct opposite effect of the determination level of exchange rates on the Jordanian economy.

Keywords: Consumer Price Index (CPI), Inflation Rate, Competitiveness, Exchange Rate, Jordan

1. INTRODUCTION

Competitiveness can be defined as a measure of a country's advantage or disadvantage in producing and selling its products in international markets, in order to sustain or increase the real income of the population (OECD, 2018). According to the World Competitiveness Center, competitiveness is the process of analyzing the facts and policies that shape the ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people (IMD, 2018).

In this paper, we focus on the Consumer Price Index (CPI) as a competitiveness measure of inflation. competitiveness can be determined throughout the strengths and weaknesses of overall improvement in competitiveness measures embodied in the surplus trade balances, improved indicators of the number of products, specialization and diversification, technology trade, and improved indicators that reflect the foreign trade policy pursued by successive governments (Cvetković & Ranđelović, 2017).

In today's world, and in order to sustain growth and income, all the economies must invest in broader measures of competitiveness. As per the Global Competitiveness Index 4.0 2018 which was introduced by the World Economic Forum it reveals that Jordan scored 59.3 out of 100, ranking Jordan in the 73rd position out of 140 countries. This index is built depending on 98 indicators and these indicators are organized into 12 pillars reflecting the extent and complexity of the drivers of productivity and the competitiveness ecosystem (Schwab, 2018).

The problem of this research arises out of the results that reveal that Jordan economy is still far away from advanced levels of competitiveness, and this may lead low percentages of economic growth, in addition to undesired economic shocks.

According to the Global Competitiveness Index (GCI) published in the year 2018, it stated that world economies should work on enhancing the fundamentals of competitiveness in order to mitigate economic shocks, and these economies should also work on building economic resilience through competitiveness in order to avoid a financial crisis. The GCI report also mentioned that economies that underperform in competitiveness

given their current income level may have difficulty sustaining that level without improving their competitiveness. In other words, high-income countries must invest beyond their current areas of strength in order to have sustained growth levels.

Based on the above, the purpose of this paper is to investigate the Consumer Price Index (CPI) as a competitiveness inflation measure and to determine whether an empirical relationship exists between the rates of inflation represented in CPI and the level of the real exchange rate.

As foreign trade competitiveness is an essential part of global competitiveness, and in order to achieve the objectives of this paper, we are going to adopt the consumer price index (CPI) as a competitiveness measure. The Consumer Price Index (CPI) is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food and medical care. It is calculated by taking price changes for each item in the predetermined basket of goods and averaging them. Changes in the CPI are used to assess price changes associated with the cost of living, the CPI is one of the most frequently used statistics for identifying periods of inflation or deflation (Petkovska & Jovanovic, 2015).

Other researchers such as Abugamea (2010), Marsh and Tokarick (1996) used two measures of competitiveness, one of which is based on price indices, and the other on wage indices. Chinn, (2006) used in addition to consumer price indices, used other competitiveness measures such as Producer Price Indices (PPI), Gross Domestic Product (GDP), each of which notably has both general advantages and shortcomings as for the measurement of a country's competitiveness. Pavličkova, (2013), studied the competitiveness of the Slovak Republic in its ability to succeed in foreign markets. She provided a complex view of Slovak foreign trade within the European Union using a sectorial classification of products. She also used multiple methods of analysis such as (Constant Market Share Analysis, Revealed Comparative Advantage, Michaely Index, and unit export and import values), which are all applied to quantify the competitiveness of Slovak foreign trade and to identify the level and trend of its specialization.

The importance of this research paper arises out of the expected benefits to be gained for both policy makers, business and other stakeholders to combine insight and action into accelerating change that would enhance the current position of competitiveness.

The structure of the paper starts with the introduction, then the second part presents the existing literature on this subject, then the third part which describes the methodology and the fourth summarizes the results. Finally, part five presents references.

2. LITERATURE REVIEW

An exchange rate is the price of a nation's currency in terms of another currency. Thus, an exchange rate has two components, the domestic currency, and foreign currency, and can be quoted either directly or indirectly. In a direct quotation, the price of a unit of foreign currency is expressed in terms of the domestic currency. In an indirect quotation, the price of a unit of domestic currency is expressed in terms of the foreign currency. Exchange rates are quoted in values against the US dollar. However, exchange rates can also be quoted against another nation's currency, which is known as a cross currency, or cross rate (Investopedia, 2018b).

Exchange rate and foreign trade are the magic words in the world of business. These Terms are the clearest language to express the economic relations between various countries which are based on common interests. Therefore, the government endeavors constantly to develop advanced scientific methods that can lead towards a better future in the best and distinct manner. The Jordanian government has exerted all possible efforts to develop the methods used in its institutions and departments to achieve the highest standards. They include the Department of Statistics (DoS) and the General Customs Department which are closely associated with the Foreign Trade Division at the (DoS). A number of governmental procedures have been taken to facilitate this process with the aim to help the citizens and improve planning and economic feasibility of projects by providing a data base on Foreign Trade figures (imports, exports and re-exports by category and country and other statistical tables related to transit and Jordan's external trade for several years...etc.), within certain coding and edit rules in order to provide the decision makers and researchers with a comprehensive accurate database (DoS, 2018)

The concept of competitiveness in economic literature emerged in its first form under the title of absolute advantage and comparative advantage (Gupta, 2015). It was used to explain the causes of foreign trade and how it could be adopted in international specialization and division of labor. However, developments after the Second World War and with the establishment of the International Monetary Fund, The World Bank and the World Trade Organization, which together formed the third pole in the world economy. This period witnessed the establishment of economic blocs and multinational companies, which led to the emergence of new divisions of international work and showed specialization in more than one country and region. Also, many economies Instead of relying on limited resources of competitiveness they have begun to pursue economic policies aiming to acquire one or several advantages to compete at the international level by encouraging business dynamism and innovation capability.

Jordan competitiveness rank for the year 2018 was determined recently in the 2018 edition of Global Competitiveness Report which assesses 140 economies. In 2018, the World Economic Forum introduced a new methodology emphasizing the role of human capital, innovation, resilience and agility, as not only drivers but also defining features of economic success in the 4th Industrial Revolution. As a result, the GCI scale changed to 1 to 100 from 1 to 7, with higher average score meaning a higher degree of competitiveness. The report is made up of 98 variables organized into twelve pillars with the most important including institutions, infrastructure, ICT adoption, macroeconomic stability, health, skills, product market, labor market, financial system, market size, business dynamism, and innovation capability. Figure 1 shows Jordan competitiveness rank from the year 2010-2018.

Figure 1. Jordan competitiveness rank
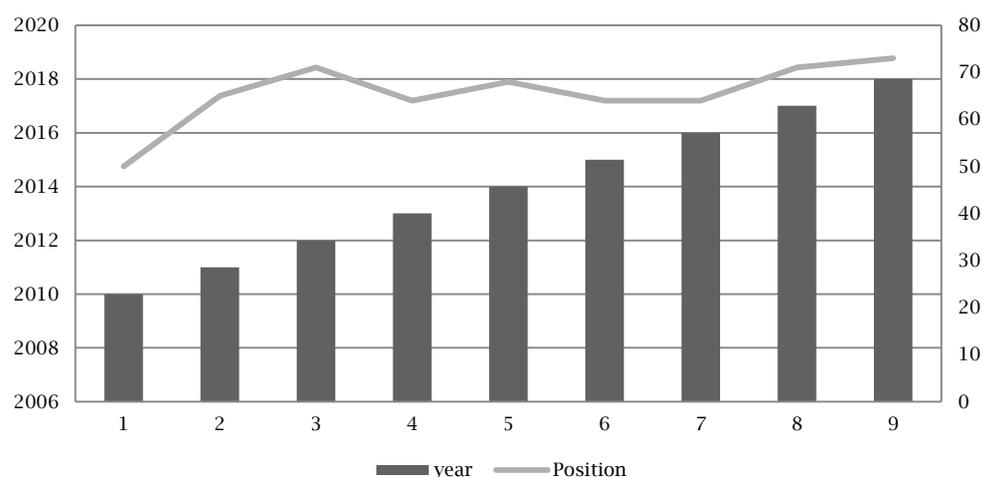
Source: Trading economis.com/World economic forum

As for Jordan balance of trade during the same period 2010-2018, it reflects deep fluctuations. Jordan recorded a trade deficit of 763979.40 JOD Thousands in November of 2018. The Average balance of Trade during the last 40 years averaged -248670.15 JOD Thousands (Trading Economics, 2018).

The Consumer Price Index (CPI) is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food and medical care. It is calculated by taking price changes for each item in the predetermined basket of goods and averaging them. Changes in the CPI are used to assess price changes associated with the cost of living, the CPI is one of the most frequently used statistics for identifying periods of inflation or deflation (Investopedia, 2018a).

Consumer price indices (CPI) are rapidly available on a monthly basis and are constructed with fairly homogeneous methodologies across countries and on the basis of comparable baskets. They include services, as well as goods, and are produced for all advanced and a large set of emerging economies. Yet they focus solely on consumer goods, hence excluding capital and intermediate goods (which are heavily traded), are subject to distortions owing to fiscal measures and they also include imported goods and services. While (CPI) does measure the variation in price for retail goods and other items paid by consumers, it does not include things like savings and investments, and can often exclude spending by visitors from another country. It also gives the government, businesses and citizens an idea about prices changes in the economy, and can act as a guide in order to make informed decisions about the economy. The index can also be used to adjust people's eligibility levels for certain types of government assistance including Social Security and it automatically provides the cost-of-living wage adjustments to domestic workers.

As the purpose of this paper is to investigate the Consumer Price Index (CPI) as a competitiveness inflation measure and to determine whether an empirical relationship exists between the rates of inflation represented in CPI and the level of the real exchange rate. The existence of linkages between the

level of the real exchange rate and the rate of inflation has been more commonly established in the theoretical literature. Adams and Gros (1986), Montiel and Ostry (1991) Calvo et al. (1994), Kamin (1996; 1997).

It is well known that a one-time devaluation (revaluation) of the nominal exchange rate may result in a temporary increase (decrease) in inflation. And also keeping the level of the real exchange rate depreciated (appreciated) for an extended period may lead to a sustained increase (decrease) in inflation (Kamin, 1997). To the extent that such a relationship holds, it poses difficulties for policy-makers, since it implies that there may be a conflict, at least in the short and medium-term, between the pursuit of price stability and maintaining external competitiveness.

3. METHOD

The purpose of this paper is to investigate the Consumer Price Index (CPI) as a competitiveness inflation measure, and to determine whether an empirical relationship exists between the rates of inflation represented in CPI and the level of the real exchange rate. As it is discussed earlier that the existence of linkages between the level of the real exchange rate and the rate of inflation has been more commonly established in the theoretical literature. In order to achieve the purpose of this paper we've collected the primary data needed from the Jordanian Department of Statistics (DoS), then we calculated the CPI's rates for the period 2010–2018. The average exchange rate of the Jordanian dinar against the Euro was also collected from the records of the Central Bank of Jordan. The reason behind choosing the exchange rate of Euro and not USD currency is because, the USD is fixed against the Jordanian Dinar JD, in other words, the government of Jordan has assigned a fix stable exchange price of JD against the USD which equal to 0.71. Table 1 illustrates the average exchange rates of the JD against the Euro for the period 2010-2018.

Other data is collected from secondary sources. Secondary data is collected from the related research papers.

As it is mentioned above the Consumer Price Index (CPI) is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food and medical care. It is calculated by taking price changes for each item in the predetermined basket of goods and averaging them. Changes in the CPI are used to assess price changes associated with the cost of living, so the formula used to calculate the Consumer Price Index for a single item is by dividing the Cost of Market Basket in a given year by the Cost of Market Basket in base year and then the outcomes are multiplied by 100:

CPI= Cost of Market Basket in Given Year / Cost of Market Basket in Base Year X 100 (1)

Table 1 and Figure 2 illustrate the calculation of CPI for Jordan, it shows the yearly average of CPI considering the year 2010 as the base year. The cost of market basket for the period of 2010 up to the year 2018 were extracted from the Jordanian Department of Statistics. The calculations indicate that the CPI Average reached 124.66 in 2018 against 119.33 compared to the year 2017 recording an increase by 5.33% which is the average inflation rate of the year 2018.

After calculating the Average CPI as noticed in Table 1, the inflation rates for the period 2010-2018 are also calculated; the inflation rates for the intended year will be equal to the change between the current year and the subsequent year. Table 1 illustrates the calculations of the inflation rates for the period 2010-2018.

Table 1. Monthly average Consumer Price Indices (CPI) & Monthly Exchange Rates 2010-2018 (2010=100)

Month	CPI	Ex %	Month	CPI	Ex %	Month	CPI	Ex %	Month	CPI	Ex %	Month	CPI	Ex %
2018M01	118.17	0.8658	2016M01	115.24	0.84	2014M01	116.28	0.7729	2012M01	106.18	0.9138	2010M01	98.35	1.0112
2018M02	123.46	0.876	2016M02	113.93	0.7706	2014M02	116.78	0.9439	2012M02	105.81	0.9393	2010M02	98.98	0.9694
2018M03	123.99	0.8748	2016M03	113.91	0.787	2014M03	117.27	0.9465	2012M03	106.61	0.9373	2010M03	99.05	0.9617
2018M04	124.28	0.8709	2016M04	114.76	0.7892	2014M04	117.39	0.9175	2012M04	107.88	0.9342	2010M04	99.02	0.9517
2018M05	124.93	0.8388	2016M05	114.64	0.8036	2014M05	116.72	0.9227	2012M05	107.7	0.9078	2010M05	98.68	0.8914
2018M06	125.07	0.8287	2016M06	114.8	0.7999	2014M06	116.99	0.9189	2012M06	108.24	0.8897	2010M06	99.27	0.8646
2018M07	125.3	0.8297	2016M07	116.43	0.7965	2014M07	117.65	0.9336	2012M07	109.16	0.8709	2010M07	99.21	0.9042
2018M08	125.48	0.8189	2016M08	116.47	0.7843	2014M08	117.99	0.9268	2012M08	109.92	0.8782	2010M08	99.85	0.9127
2018M09	125.25	0.827	2016M09	115.94	0.7938	2014M09	118.2	0.943	2012M09	110.14	0.9118	2010M09	100.96	0.9244
2018M10	125.09	0.8152	2016M10	116.21	0.7942	2014M10	118.23	0.9459	2012M10	110.37	0.9186	2010M10	101.69	0.983
2018M11	126.12	0.8065	2016M11	116.55	0.7815	2014M11	117.74	0.9657	2012M11	111.93	0.9085	2010M11	101.83	0.967
2018M12	125.21	0.8055	2016M12	117.05	0.7641	2014M12	117.93	0.9546	2012M12	112.5	0.9311	2010M12	103.13	0.9366
2017M01	118.17	0.8075	2015M01	116.46	0.7462	2013M01	112.54	0.9698	2011M01	103	0.9472			
2017M02	119.12	0.7532	2015M02	114.8	0.8241	2013M02	113.15	0.9138	2011M02	102.53	0.9674			
2017M03	118.78	0.7541	2015M03	115.84	0.8048	2013M03	113.53	0.9393	2011M03	102.85	0.9933			
2017M04	118.8	0.7583	2015M04	116.14	0.7666	2013M04	113.47	0.9373	2011M04	103.57	1.0253			
2017M05	118.88	0.7602	2015M05	116.47	0.7661	2013M05	112.5	0.9342	2011M05	103.64	1.0148			
2017M06	119.03	0.7853	2015M06	117.38	0.7908	2013M06	113.45	0.9078	2011M06	103.92	1.0203			
2017M07	118.56	0.7976	2015M07	116.92	0.7949	2013M07	114.09	0.8897	2011M07	104.08	1.0092			
2017M08	119.13	0.8187	2015M08	117.12	0.7795	2013M08	114.58	0.8709	2011M08	104.77	1.0153			
2017M09	120	0.838	2015M09	116.81	0.7893	2013M09	115.17	0.8782	2011M09	104.99	0.9746			
2017M10	120.26	0.8444	2015M10	116.84	0.7966	2013M10	115.71	0.9118	2011M10	105.1	0.9737			
2017M11	120.44	0.8335	2015M11	115.97	0.7946	2013M11	115.28	0.9186	2011M11	105.41	0.9626			
2017M12	120.84	0.8325	2015M12	116.07	0.7308	2013M12	116	0.9085	2011M12	106.14	0.934			

Figure 2. Yearly average Consumer Price Indices 2010-2018 (2010=100)
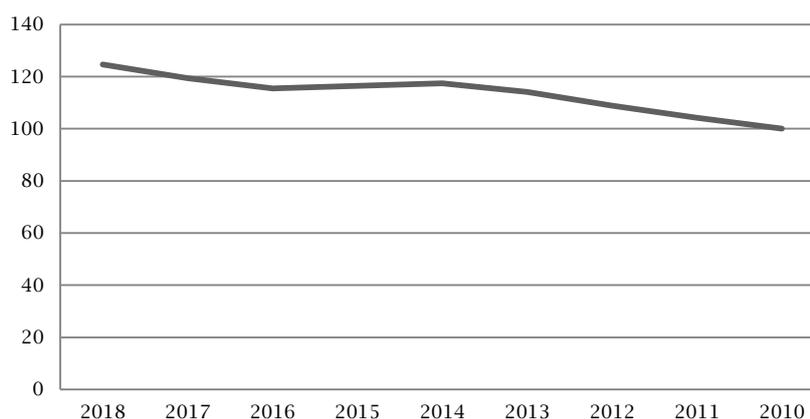

The next step of our method is to perform the Pearson correlation analysis between the monthly averages of CPI rates and the monthly averages of the exchange rates (Table 1), illustrates the monthly rates of both CPI & The exchange rates.

The outcomes of the correlation analysis conducted reflect a negative significant correlation of 62% between the exchange rates and the CPI's inflation rates for the period 2010-2018 (Uma, 2016). Table 2 and Figure 3 illustrates these outcomes.

Table 2. Correlations analysis

		CPI Rate	*% Ex. Rate*
CPI Rate	Pearson Correlation	1	-.620**
	Sig. (2-tailed)		.000
	N	107	107
% Ex. Rate	Pearson Correlation	-.620**	1
	Sig. (2-tailed)	.000	
	N	107	107

*Note: ** Correlation is significant at the 0.01 level (2-tailed).*

Figure 3. Correlation Analysis for both %CPI & %Ex. Rate
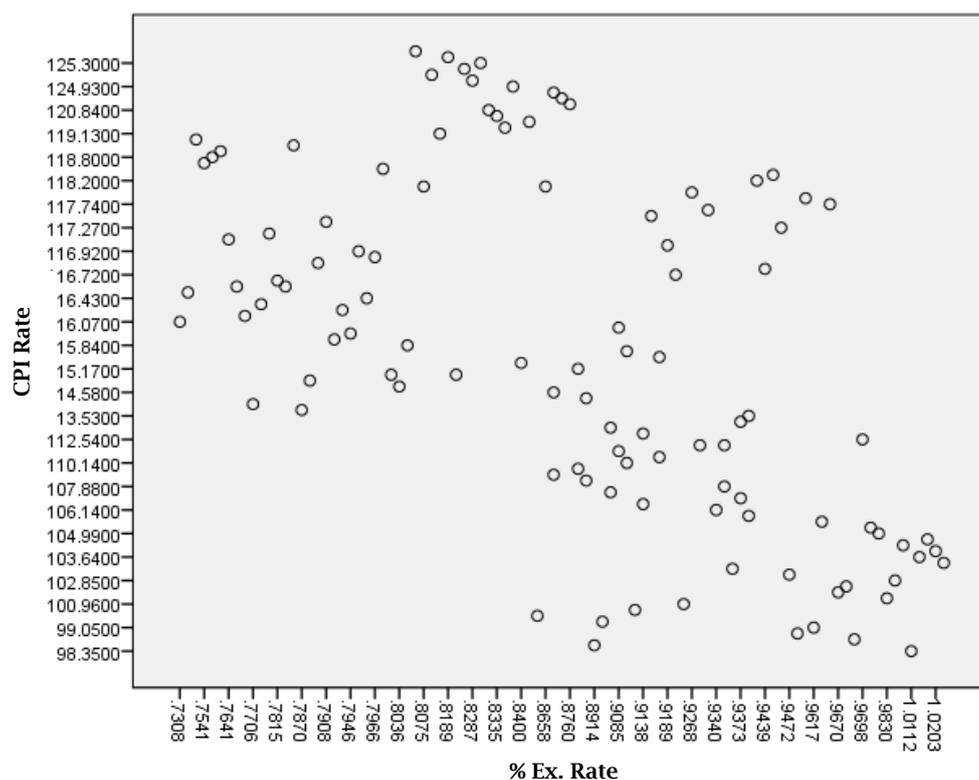
The above Figure 3 shows the outcomes explained earlier of the correlation analysis of the monthly average CPI rates, and the monthly average exchange rates for the period 2010-2018. The scattered points reflect a 62% of correlations between the two variables. Which means that there is a significant relationship between the exchange rates and the inflation rates of Jordan, and this result matches with the results obtained by Kemin (1996).

4. CONCLUSION

Based on the above analysis the following conclusions can be made, noticing that, these results are applicable to Jordan economy only, and can't be generalized on other economies of the world:

- There is a significant relationship between the exchange rates and the CPI rates of Jordan.
- The outcomes reflect a negative correlation, which means that when CPI rates increases, the exchange rates tend to decrease, and vice versa. In other words, the CPI rates cause the direct opposite effect on the determination of exchange rates level.
- As CPI rates is associated with competitiveness level, and when we are facing high exchange rates, and at the same time there are high rates of inflation, the government should work on lowering the inflation rates by increasing the real exchange rates, with a corresponding loss of competitiveness.

Similar to any academic endeavor, this study also suffers from certain limitations and as such the findings of the study should be evaluated in light of those limitations. However, these limitations also provide opportunities for further research in this area:

- This study is conducted on the Jordanian environment, so caution should be exercised in generalizing the findings of this study.
- This study is examining CPI's effect on the exchange rates only, knowing that other factors could be affected by the CPI's rate such as interest rates and growth rates.

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