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DETERMINANTS OF INFLATION IN GCC COUNTRIES

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ABSTRACT:

The study aimed to determine the influence of GDP and money supply toward inflation level in GCC countries. The main data source was from World Data banks and regions indication lists. The World Bank data was extracted for relevant variables and countries. A linear regression model in simple terms was created by fitting line through construction of scatter plots of paired observations. The regression model was involved one variable plotted on x-axis and y-axis. The independent variables were GDP and money supply while dependent variable was inflation rate. The result showed money supply had impacted inflation which trend that was common for most countries. Thus, inflation indicators highlighted was confirmed as oil price. Besides, GDP was increased and caused inflation also increased in UAE which the economy was depended upon hydrocarbon as compared with other GCC countries.

INTRODUCTION:

Inflation is economic phenomenon that price level rises and money value decreases which increase living cost [1,2]. Inflation has been a global challenge. Furthermore, inflation is very unanticipated either in developed countries nor undeveloped countries are fully equipped in facing inflation effect. The inflation is caused by several factors either economically or external factors. The economy factors are divided into monetary and non-monetary factors [3]. Inflation effect on economy which can be positive and

negative effects. Positive effect such as ensuring that central banks adjusted real interest rates and encourage investment in non-monetary capital projects. Meanwhile, negative effects included increase opportunity, holding money cost and uncertainty over future inflation which contribute less investment and saving in the future [4]. Inflation is measured with index numbers such as gross domestic product (GDP) deflator, whole price index (WPI) and consumer price index [2]. GDP is basic determinant of country economic performance and market value of all final good and services made within the borders of a nation in a year [5]. The GDP is important in economic growth analysis as reflected overall key summarization of economic activities [6]. Besides, monetary supply also influence the inflation rate. The monetary supply is defined as money amount within specific economy available for purchasing goods or services [7]. The money supply is regulated by monetary policy [8]. The demand for money caused increment in money supply which lead decreased in domestic interest rate [9]. The study aimed to determine the influence of GDP and money supply toward inflation level in GCC countries. The GCC countries included Saudi Arabia, United Arab Emigrated, Oman, Qatar, Kuwait and Bahrain.

METHODOLOGY

The main data source was from World Data banks and regions indication lists. The World Bank data was extracted for relevant variables and countries. A linear regression model in simple terms was created by fitting line through construction of scatter plots of paired observations. The regression model was involved one variable plotted on x-axis and y-axis. The independent variables were GDP and money supply while dependent variable was inflation rate.

RESULT AND DISCUSSION

Based on Table 1, inflation rate for Saudi Arabia had fluctuated on last decade. In early 2000s, the inflation was negative with steady growth raised to almost 10%. The GDP had increased included money supply also indicated an overall trend increment.

Table 1. Descriptive statistics for Saudi Arabia

	Inflation	GDP	Money supply
Mean	2.743	323699.67	16031.37
Std. error	0.775	70977.94	1616.871
Median	2.671	309287.35	15655.083
Std. Deviation	3.00	274896.37	6262.12
Sample variance	9.01	7556801.45	39214097.59
Kurtosis	0.70	-1.44	-1.46
Skewness	0.79	0.26	0.19
Range	10.99	725574.03	16567.45
Min.	-1.13	18866.53	8315.74
Max.	9.87	744440.56	24883.19
Sum	41.15	4855495.09	240470.53

Count	15	15	15
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Table 2. Regression model for money supply and inflation for Saudi Arabia

Regression statistics	
Multiple R	0.64
R square	0.41
Adjusted R square	0.36
Std. error	2.40
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	51.35	51.35	8.93	0.01
Residual	13	74.79	5.75		
Total	14	126.15			

	Coeff.	Std. error	T-statistics	p-value
Intercept	0.49	0.98	0.50	0.63
GDP	6.97e-6	2.33	2.99	0.01

The R square was 0.4 indicated that GDP explained 40% of variation in inflation. Meanwhile, p-value was 0.01 <0.05 indicated both inflation and GDP had significant relationship. This result confirmed that GDP increased tend to impact the inflation increment.

Table 3. Regression model for money supply and inflation for Saudi Arabia

Regression statistics	
Multiple R	0.65
R square	0.42
Adjusted R square	0.38
Std. error	2.37
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	53.06	51.06	9.44	0.01
Residual	13	73.08	5.62		
Total	14	126.14			

	Coeff.	Std. error	T-statistics	p-value
Intercept	-2.24	1.74	-1.29	0.22

GDP	0.000310896	0.0001	3.07	0.01
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The R square value was 0.42 at acceptable level indicated that GDP explained 42% of variation in inflation. Thus, the data sampling for regression model was acceptable for inflation and money supply. The p-value was $0.01 < 0.05$ indicated there was significant relationship which showed increased in money supply increased inflation rate. In additions, this result indicated that government expenditure and increased in oil prices tend to increase the inflation as power spending increased and more demand for imported products.

Table 4. Descriptive statistics for UAE

	Inflation	GDP	Money supply
Mean	3.987	34949.53	38540.76
Std. error	0.815	5858.62	1244.14
Median	2.6	27617.45	39901.22
Std. Deviation	3.156	22690.35	4818.54
Sample variance	9.958	514851952.6	23218296
Kurtosis	2.026	-0.110	-1.70
Skewness	1.656	1.088	-0.05
Range	105	64792.77	13614.37
Min.	1.3	13631.62	32105.65
Max.	11.8	78424.39	45720.02
Sum	59.8	524242.88	578111.4
Count	15	15	15

In Table 4, inflation rate for UAE had fluctuated over last decade. In early 200s, the inflation was more than 1 with very steady growth raised to more than 10%. The GDP had increased as well along with money supply also indicated an overall increased trend.

Table 5. Regression model for GDP and inflation for UAE

Regression statistics	
Multiple R	0.15
R square	0.02
Adjusted R square	-0.05
Std. error	3.24
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	3.23	3.23	0.31	0.59
Residual	13	136.19	10.48		
Total	14	139.42			

	Coeff.	Std. error	T-statistics	p-value
Intercept	3.25	2.06	-0.15	0.06
GDP	62.12e-5	0.56	-6.1e-5	0.59

The p-value was $0.58 > 0.05$ which there was insignificant relationship between inflation and GDP. This result indicated increment in GDP did not affected increased in inflation which related to UAE economy being different compared other GCC countries.

Table 6. Regression models for money supply and inflation for UAE

Regression statistics	
Multiple R	0.51
R square	0.26
Adjusted R square	0.20
Std. error	2.82
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	36.29	36.29	4.57	0.05
Residual	13	103.13	7.93		
Total	14	139.42			

	Coeff.	Std. error	T-statistics	p-value
Intercept	-8.89	6.06	-1.47	0.17
GDP	0.00034	0.00016	-2.14	0.05

The R squared value was 0.26 indicated that money supply explained 26% of the variation in inflation. Thus, the p-value was 0.05 indicated there was significant relationship between money supply and inflation. Although, the revenue streams for UAE different from other GCC countries but the dependency on the imports was same for UAE as well. Thus, the impact of money supply was same as Saudi Arabia.

Table 7. Descriptive statistics for Oman

	Inflation	GDP	Money supply
Mean	1.735	3572.61	15390.64
Std. error	0.415	428.66	1391.09
Median	2.353	4008.30	16225.66
Std. Deviation	1.609	1660.19	5387.68

Sample variance	2.589	2756228	29027136
Kurtosis	-0.817	-1.66	-1.71
Skewness	-0.856	0.14	-0.11
Range	4.734	4624.10	14403.81
Min.	-1.208	1605.31	8559.57
Max.	3.526	6229.41	22963.38
Sum	26.019	53589.12	230859.60
Count	15	15	15

Based on Table7, the inflation for Oman had fluctuated over last decade. In early of 2000s, the inflation was negative with very steady growth raised over 0.05%. The GDP had increased as well as money supply also indicated an overall increased trend.

Table 8. Regression model for GDP and inflation for Oman

Regression statistics	
Multiple R	0.53
R square	0.28
Adjusted R square	0.23
Std. error	1.42
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	10.18	10.18	5.08	0.04
Residual	13	26.06	2.00		
Total	14	36.24			

	Coeff.	Std. error	T-statistics	p-value
Intercept	-0.10	0.89	0.11	0.91
GDP	0.0005	0.00023	2.25	0.04

The R squared value was 0.28 indicated that sampled data was acceptable for tested applied regression mode. The p-value was 0.04 indicated strong relationship between inflation and GDP. Since t statistical was greater than 1.85 which showed significant relationship between two variables. The GDP increased for Oman in inflation increment. The economy was smaller but similar to Saudi Arabia with high dependency upon oil.

Table 9. Regression model for money supply and inflation

Regression statistics	
Multiple R	0.57
R square	0.33
Adjusted R square	0.28

Std. error	1.37
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	11.92	11.92	6.37	0.03
Residual	13	24.32	1.87		
Total	14	36.24			

	Coeff.	Std. error	T-statistics	p-value
Intercept	-0.90	1.10	-0.82	0.43
GDP	0.00017	6.78e-5	2.52	0.03

The R squared was 0.32 indicated 32% was explained by money supply. The p-value was 0.02 indicated strong relationship between inflation and money supply. Since the t statistic was greater than 1.85 which showed there was significant relationship between the variables. For Oman, money supply resulted in inflation increment. The literature evidence indicated that basic food commodities were major import for Oman as well. Thus, increase in money supply resulted in more spending and higher imports which raises the inflation as well due to lack of supply and increased in demand.

Table 10. Descriptive statistics for Qatar

	Inflation	GDP	Money supply
Mean	3.486	19139.89	62373
Std. error	0.640	2565.58	6397.59
Median	3.057	18776.49	61593.67
Std. Deviation	2.479	9936.44	24777.74
Sample variance	6.143	98732742	6.14e08
Kurtosis	4.095	-1.45	-1.45
Skewness	1.678	0.41	-0.06
Range	9.694	27396.18	66366.78
Min.	0.888	7779.18	28577.30
Max.	10.588	35175.37	94944.09
Sum	52.301	287098.30	935595
Count	15	15	15

Table 10 showed inflation rate for Qatar had fluctuated over last decade. In early 2000s, the inflation under 1% with very steady growth raised over 10%. The GDP had increased as well along with money supply also indicated an overall increased trend.

Table 11. Regression model for GDP and inflation for Qatar

Regression statistics	
Multiple R	0.31
R square	0.10
Adjusted R square	0.03
Std. error	2.44
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	8.41	8.41	1.41	0.26
Residual	13	77.60	5.97		
Total	14	86.00			

	Coeff.	Std. error	T-statistics	p-value
Intercept	1.99	1.41	1.42	0.18
GDP	7.8E-05	6.57E-05	1.19	0.26

The R squared value was 0.09 indicated that GDP explained of the variation 9% in inflation. The p-value was 0.25 indicated insignificant relationship between GDP and inflation in Qatar. This result also indicated that GDP was not correlated with increment of inflation.

Table 12. Regression model for money supply and inflation of Qatar

Regression statistics	
Multiple R	0.54
R square	0.29
Adjusted R square	0.24
Std. error	2.16
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	25.09	25.09	5.36	0.04
Residual	13	60.91	4.69		
Total	14	86.00			

	Coeff.	Std. error	T-statistics	p-value
Intercept	0.12	1.56	0.07	0.94
GDP	5.4E-05	2.33E-05	2.31	0.04

Meanwhile, the result indicated the data was acceptable as R squared was 0,29 which showed money supply explained 29% of the variation in inflation. The p-value was 0.04 which indicated strong significant relationship between money supply and inflation in Qatar. This result was common trend for other countries due to dependency upon import. The p-value for GDP was higher compared with p-value for money supply.

Table 13. Descriptive statistics of Kuwait

	Inflation	GDP	Money supply
Mean	4.306	15026.08	36573.33
Std. error	1.492	3923.17	3229.02
Median	2.264	9749.05	37725.14
Std. Deviation	5.780	15194.38	12505.93
Sample variance	33.409	230869050.20	1156398403.80
Kurtosis	-0.366	-0.65	-1.30
Skewness	0.595	0.92	-0.34
Range	19.913	42052.22	36951.44
Min.	-4.863	1163.24	17532.86
Max.	15.050	43215.46	54484.30
Sum	64.593	225391.18	548599.93
Count	15	15	15

Based on Table 13, inflation rate for Kuwait had fluctuated over last decade. In early of 2000s, the inflation was negative with very steady growth raised over 15%. The GDP had increased as well as money supply also indicated overall increased trend.

Table 14 Regression model for GDP and inflation for Kuwait

Regression statistics	
Multiple R	0.29
R square	0.08
Adjusted R square	0.08
Std. error	1.37
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	39.17	39.17	1.19	0.30
Residual	13	428.56	32.97		
Total	14	467.73			

	Coeff.	Std. error	T-statistics	p-value
Intercept	5.96	2.12	2.81	0.01
GDP	0.0001	0.0001	1.09	0.30

The R squared was 0.08 indicated that GDP was explained 8% of the variation in inflation. The p-value was $0.30 > 0.05$ showed significant relationship between GDP and inflation in Kuwait. The GDP was not correlated with increment in inflation.

Table 15. Regression model for money supply and inflation for Kuwait

Regression statistics	
Multiple R	0.39
R square	0.16
Adjusted R square	0.09
Std. error	5.51
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	72.57	72.57	2.39	0.15
Residual	13	395.16	30.40		
Total	14	467.73			

	Coeff.	Std. error	T-statistics	p-value
Intercept	2.35	4.54	0.52	0.61
GDP	0.0002	0.00012	1.55	0.15

The R squared was 0.15 at acceptable level which indicated that money supply was explained 15% of the inflation. Thus, the data sampling for testing regression model was acceptable for tested inflation and money supply. Meanwhile, p-value was 0.14 indicated insignificant relationship between inflation and money supply.

Table 16. Descriptive statistic for Bahrain

	Inflation	GDP	Money supply
Mean	2.585	8801.39	19078.31
Std. error	0.846	1394.34	1051.56
Median	1.861	9523.99	19669.32
Std. Deviation	3.275	5400.26	4072.67
Sample variance	10.725	29162816.37	16586658.57
Kurtosis	4.499	-1.88	-1.34
Skewness	1.837	0.08	-0.32
Range	12.907	13879.16	11597.60
Min.	-0.817	2445.30	12917.40
Max.	12.091	16324.46	24515.00
Sum	38.780	132020.80	286174.72

Count	15	15	15
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Table 17. Regression model for GDP and inflation

Regression statistics	
Multiple R	0.43
R square	0.18
Adjusted R square	0.12
Std. error	3.08
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	27.16	27.16	2.87	0.11
Residual	13	122.98	9.46		
Total	14	150.15			

	Coeff.	Std. error	T-statistics	p-value
Intercept	0.32	1.56	0.20	0.84
GDP	0.0003	0.0002	1.69	0.11

The r squared value was 0.18 indicated that GDP explained 18% of inflation. The p-value was 0.11 indicated there was insignificant relationship between GDP and inflation for Bahrain. T-statistic was 1.69 indicated that relationship between two variables insignificant. This result showed GDP increased had no impact on increment in inflation.

Table 18. Regression model for money supply and inflation

Regression statistics	
Multiple R	0.58
R square	0.33
Adjusted R square	0.28
Std. error	2.78
Observations	15

ANOVA

	df	SS	MS	F	Sig.F
Regression	1	49.97	49.97	6.48	0.02
Residual	13	100.18	7.71		
Total	14	150.15			

	Coeff.	Std. error	T-statistics	p-value
Intercept	0.32	1.56	0.20	0.84
GDP	0.0003	0.0002	1.69	0.11

The R squared was 0.33 indicated that money supply explained 33% of inflation. The p-value was $0.02 < 0.05$ showed there was significant relationship which increment in money supply lead inflation rate increment. The increment in oil prices had influence inflation as spending power increased and more demand for imported products occurred.

CONCLUSION

In conclusions, money supply had impacted inflation which trend that was common for most countries. Thus, inflation indicators highlighted was confirmed as oil price. Besides, GDP was increased and caused inflation also increased in UAE which the economy was depended upon hydrocarbon as compared with other GCC countries. The inflation impact toward another economic factors need to implement in future study such as unemployment and poverty rates.

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