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INTEREST RATE RISK ON LOANS AND SAVINGS IN THE SAUDI ECONOMY

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ABSTRACT:
This study identifies the effects of the interest rates fluctuations on loans, saving and GDP in the Saudi economy and the risks associated. This study also determines how much do loans, and savings depend on the interest rates and the possible ways to prevent any future risks. The method used to find the relation between the interest rates, loans, saving and the GDP is Regression. The data used are for the time period from 2003 till 2013. The obtained result indicates that loans saving and GDP are heavily depending and on the interest rates in the Saudi Economy. Hence, any changes in the interest rates, affects both negatively and positively on the variables used in the Saudi economy. These results appear to affect the aggregate demand in Saudi Arabia. The importance of the study highlighted proper policies to loans and savings related to interest rate will help the private sector to prosper and grow. In addition, helping the policy makers to plan ahead the economic instability and find proper adjustments.

INTRODUCTION:
Saudi Arabia is an emerging market. The monetary policies are different and changing from one market to the other. However, there are constant variables that affect the long-term borrowing in all emerging markets including Saudi Arabia. Turner [1] has demonstrated different borrowing tools to lower the risk and stabilize the economy. Global long-term interest rate is much more important for the monetary policies in emerging economies [2, 3]. The monetary policies in the emerging markets have become more flexible, by lowering the rate of the local long term and have made the monetary policies

more flexible [4]. This low premium has pushed investors from emerged markets to emerging markets like Saudi Arabia. These changes have significant impacts on the local banking systems. Since EME corporations have been borrowing on a high scale, and acquiring assets, the value of these assets are being hard to measure as contrast to the liabilities. Furthermore, acquiring foreign assets can increase the risk. This happened because of the difference in the corporation foreign liabilities and assets. Even if the net external liability remains the same, external risk rises. Both foreign assets and liabilities offer a huge challenge for financial stability policies.Issuance of this large scale can have bad effect on the local banking system in EME's through these three channels. First reason is because the EM (Saudi Arabia) corporations have borrowed from local bank not external or international bank. Finding funds in local bank to lend other borrowers is hard to maintain, finding new consumers is not easy and that affects the economy and specially small firms as they are not able to borrow abroad like the EM corporations [5, 6]. The second reason is having wholesale funding for banks [7]. When the EM (Saudi Arabia) corporations are full and backed with cash it will help the external funding while increasing the whole sale deposit in local banks. Moreover, this might have a reverse benefit. The situation could get worse and the banks will face hard times in funding themselves. The third reason is hedging their forex or maturity exposure, by having derivative contracts in local banks [8]. The oversea bank will be able to increase the risk of the local bank if they hedge. So by this the local corporations will stay at risk and won't be able to meet their side of the contract. The result of these three reasons is that the local bank will find difficulties in stabilizing the economy, and the corporations to finance themselves abroad. When having a deep connection of EMEs (Saudi Arabia) into global debt markets, it has made the market more sensitive to the any developments of the debt market in advanced economies as Turner [1] stated. Local Currency debt markets have had a huge change and transformation from how it was a decade ago. Recently it had been easier for EME corporations to borrow in capital markets, local and foreign.Monetary policy has been known to change with open economy changes; it changes with both short-term policy changes and exchange rate changes [9, 10]. Some central banks have been developing policies only on these two variables. The exchange rate is very important to stabilize the economy. Before the crisis, having low policy rates has led the advanced economies to have strong exchange rate increase pressure in emerging markets (Saudi Arabia). The great factor in the EME (Saudi Arabia) has changed from the past years till now, which is raising the domestic long-term interest rate. Furthermore, the long-term interest rates have become the goal for most Central banks in many countries, lowering the rate to stimulate the aggregate demand. By this mean, the monetary policy can be summarized with three main characteristics according to Turner [1]. They are short-term policy rate, exchange rate and long-term interest rate on government bonds.This study argued on the movement of the US banks in long-term interest rates, can have huge effects on the monetary policy and the financial stabilities in EMEs (Saudi Arabia). Since the declining global long-term interest rate is over, central banks in the advanced economies will raise the short-term interest rate and reduce the holding on governments and different debts (bonds). Having higher long-term

interest rates, currency depreciation and more changeable market could increase the difficulty of the choices taken in EM (Saudi Arabia) central banks. These choices are on the exchange rates, and on the long-term interest rate. Moreover, the focus of this study is according to Turner [1], which is on the price changes, interest rates and exchange rates. This study has also demonstrated that the ease in local bank lending is due to the large rise in borrowing by EM in non-financial corporations on international capital markets.

METHODOLOGY

The model used is in this study is regression analysis. This model will assess and analyse the relationship with loans and savings as how it is related to the interest rate changing. How the increase of interest rates will affect the loans, savings and well as the GDP.

Data Collection and Analysis

The data and variable used in the methodology are the gross loans, gross savings, GDP and Interest rates. The data in Table 1 are taken from Bloomberg, trading economic and Knoema to be assed and analysed. Gross loans and Gross savings were available in percentages, so transferring them in billion to be the same as the GDP is the first step. The data of Data of interest rates, gross loans, gross savings and GDP from 2005 till 2013 are tabulated in Table 2. The descriptive analysis Tabulate in Table 3 will be interpreted the fluctuation occurred during the past years.

Table 1: Gross loans and Gross savings on GDP (%)

Gross Savings (% of GDP)	Gross Loans (% of GDP)
49.606	1.900
49.735	2.000
48.925	2.100
52.753	1.400
36.592	3.287
43.414	2.968
50.463	2.224
48.788	1.670
44.061	1.307

Table 2: Data of interest rates, gross loans, gross savings and GDP

Year	IR	GL	GS	GDP
2005	5.145	6.241	162.935	328.460
2006	5.000	5.538	137.717	276.900
2007	4.247	8.734	203.484	415.910
2008	2.952	7.277	274.209	519.800
2009	1.212	14.105	157.018	429.100

2010	.951	15.636	228.710	526.810
2011	.925	14.890	337.854	669.510
2012	1.055	12.257	358.086	733.960
2013	1.038	9.729	327.966	744.340

Table 3: Statistical Analysis

	IR	GL	GS	GDP
Mean	2.503	10.490	243.109	516.088
SD	1.846	3.850	84.475	170.7 53
Max	5.145	15.636	358.086	744.340
Min	.925	5.538	137.717	276.900
Skewness	.598	.105	.166	.126
Kurtosis	-1.789	-1.768	-1.782	-1.360

Based on Table 3, the maximum interest rate was in 2005 at 5.145 and the minimum rate was in year 2011 at 0.925. As for the Gross loans the maximum was 16.636 in 2010 and the minimum was 5.538 in 2006. For the Gross Savings the maximum is 358.086 in 2012 and the minimum is 137.717 in 2006. Furthermore, for the GDP the maximum is 744.340 in 2013 and the minimum is 276.900 in 2006.

Mean and Standard Deviation explains how linked together they are. The smaller the SD it means the stronger it is linked to the Mean. From Table 3, the Interest rates Mean is 2.503 and the SD is 1.846, which indicates it has a strong ration with the mean. For GL, the mean is 10.490 and the SD is 3.850, the numbers are far from each other, which indicate that they do not depend on each other much. From GS, it is the same as GL the mean is 243.109 and the SD is 84.475 which means they do not depend on each other. Kurtosis is the sharpness of the peak in a particulate frequency. Skewness measures the tail if the graph, whither it is on the right or on the left. All the available numbers are positive with means the graphs tail is on the right. The kurtosis is all-negative and it is measured around 3. The negative means the distribution is flat. It does not have a peak and did not reach 3.

The Regression Model

For the regression analysis the Y is the interest r ate and the first X variable is GL, second X variable is GS and the third X variable is GDP. The model used is Interest rate = alpha + beta1*GL + beta2*GS+beta3*GDP+ error
This model was created to understand and learn the relation between interest rates, loans, saving and GDP. Furthermore, to understand more how loans, savings and GDP depend on the interest rate.

RESULT AND DISCUSSION

The method and model used is Regression analysis. R Square is always from 0% to 100%. Having the R square close to 0% means model and its data variables are not related or around the mean, which means closer to 100% is the relation and that the model explains the variable are related to the mean. Having the r square closer to 100% indicates the model is fits the data. According to Table 4, the result is 0.95 which is 95%, it means that the data are related to the model and that the data are around the mean and related to it. Adjusted R Square means the estimation according to R Square shrinkages. If the number is close to R Square it means that the shrinkage is very low. According to Table 4, the Adjusted R Square is 93%, which is very close to the R Square that indicates that the rate or shrinkages is very low.Standard Error measures the average distance between the data points and the regression line in the dependent variable unit (dollars). The results in Table 4 indicates that the standard error is $0.49 which means that the average distance away from the regression line is $0.49 and how tightly around the data is accordance to the data line.

Table 4: Regression Statistics

Multiple R	.978
R Square	.956
Adjusted R Square	.930
Standard Error	.490
Observations	9.000

F measures the significance with in relation to the significance F. According to ANOVA analysis in Table 5, F is 36.3 and significance f is 0.001 which is lower than 0.05. This indicates it is insignificant.The coefficients explain how the variables are related to the intercept. Table 6 demonstrates the Variable 1 is -0.234, which indicates for every 1% increase in the interest rate a $0.234 dollar decrease in loans. Variable 2 is 0.015, which means every 1% increase in interest rate a $0.015 increase happen the savings. Moreover, in variable 3 every 1% increase in interest rates results in -0.013 decrease in GDP. P values are measured and interpreted around 0.05. If the value is less means it is significant and if it is higher than it is insignificant. From Table 6, GL is 0.01 that means it is significant. GS is 0.13, which is higher than 0.05 that means it is insignificant. Furthermore, GDP is 0.03 that is less than 0.05, means it is significant.

Table 5: ANOVA Analysis

	df	SS	MS	F	Sig. F
Regression	3.000	26.068	8.689	36.260	.001
Residual	5.000	1.198	.240		
Total	8.000	27.267			

Table 6: Coefficients and the P-value of variables

|	Coefficients	P-value
Intercept	8.108	.000
X Variable 1	-.234	.012
X Variable 2	.015	.136
X Variable 3	-.013	.033
Variable 1 is GL, Variable 2 is GS, and Variable 3 is GDP		

The model of the regression analysis after implementing the analysis is IR = 8.108-0.234*GL+0.15*GS-0.013*GDP
The intercept is the alpha used which is 8.108, it indicates that the increase in the interest rates shows the decrease of the loans as it is -0.234. Moreover, the increase in interest rate will increase the gross savings because it is +0.15 and the increase in interest rate affect the GDP negatively and it decreases it as it indicates -0.013.

Residual Plot

The residual plot explains the regression prediction result of each variable. The prediction of the model is on the x-axis and the accuracy of the model is on the y-axis. The distance at the line (0) measure how bad the prediction it was for the value. The residual plot explains the predicted gross savings, gross loans and GDP. The values vary in negatives and positives for the y-axis. The negative points means the prediction is very high. As per the positives it means it is very low. Moreover, what is on the x-axis means it is exactly correct.
Figure 1 illustrates most of the points on this graph are on the positive side on the y-axis, which indicates as stated it is very low. Three points are negatives, which mean they are very high predictions. One point in on the x-axis and three are very close which indicates they are exactly correct. Four points show the prediction is almost correct and exact. The pattern is clear, which means there are chances for improvements.
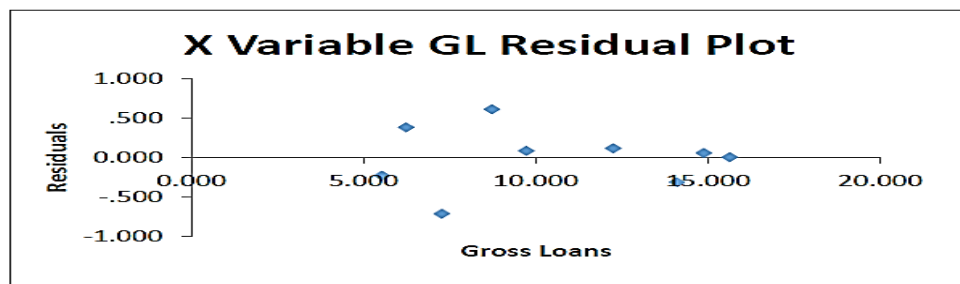
Figure 1: X variable GL residual plot

Figure 2 explains the predicted gross savings. The values vary in negatives and positives for the y-axis. The points are close to each other and do not vary much. This results that the prediction is not very high and not very low as for

the variations. The pattern is somehow clear; there is a little room for improvements.
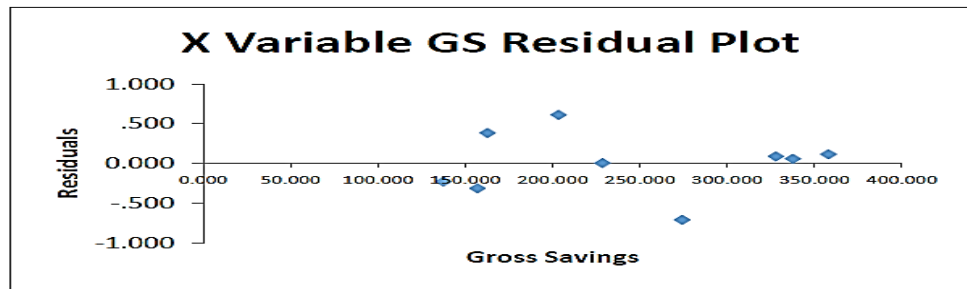

Figure 2: X variable GS residual plot

Figure 3 indicates the variables vary in a clear pattern. Five points are positives and three are negative. Which indicates the low is higher than the higher prediction. One point is on the x-axis, which means it is exactly correct and one is very close, which is a good indicator. Even though the pattern is velar but the prediction is very low.
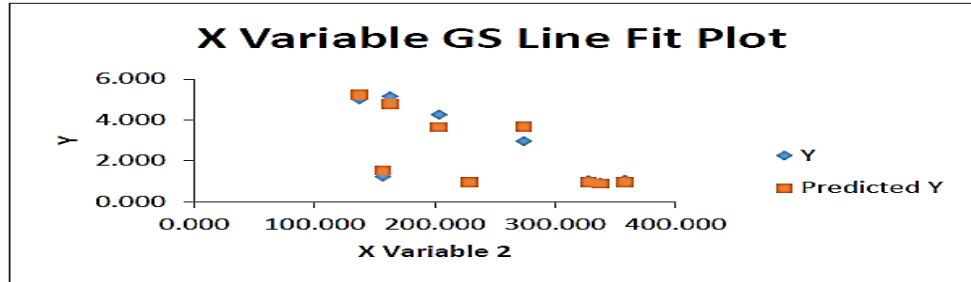

Figure 3: X variable GDP residual plot

Line Fit Plot

Line fit plot is a graph that explains the predicted data with the actual data results. The line in the graph is the regression line. It evaluates how well the model fits the data and if it meets the goals. If the left side of the graph is higher than the right side means that the spread of the residual is small relatively than the fitted values. Figure 4 indicates that Variable 1 is the gross loans. This graph indicates left higher than right, which means the residuals are smaller than the fitted plot. The distribution is not equally distributed which means it does not fit the data.
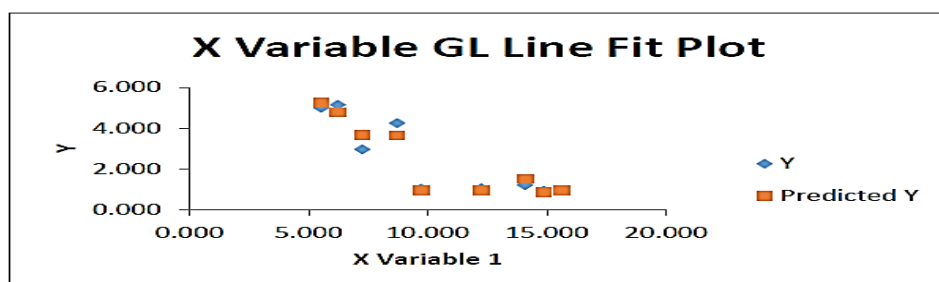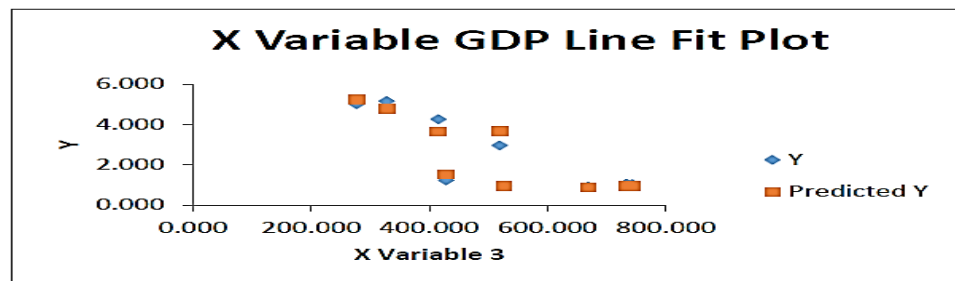
Figure 4: X variable GL line fit plot

Figure 5 indicates that the left is higher than the right, which means that the residuals are smaller than the fitted plot. Moreover, it is not equally distributed which means it does not fit the data.

Figure 5: X variable GS line fit plot

Figure 6 shows the GDP line fit plot, where the left is higher than the right so the residuals are smaller than the fitted. Furthermore it is not equally distributed which means it does not fit the data. In overall, the line fitted plot appears not to fit the data so they are not accurate to be assessed for the data used in this model.

Figure 6: X variable GDP line fit plot

CONCLUSION
Hedging and predicting the risk is always important to have and to calculate at any time. Preferably hedging and having the future knowledge will eliminate any losses. From the results shows how deeply the loans, saving and the GDP depend on the interest rates. Moreover, any fluctuations in the interest rates affect these factors heavily. Any increase in the interest rates results in the decrease in loans and GDP. GDP is the gross domestic product, this assesses the economy and how does these changes impact the stabilization of the economy.Furthermore, the Saudi economy had high demands for loans from 2004 to 2008, in the private and public sector. The loans to deposit ratio had its peak at 80.5% in 2008 according to the Saudi Hollandi Capital. After 2008, which were the global crises the rate decreased but the loans were still being requested on a good but slower pace. Moreover, the interest rates (SIBOR) are affected by the US interest rate rates because the Saudi riyal is pegged to the US dollar. The economy was in a good position, but after the crises that started from the US, our loans to deposit ratio have decreased. The Saudi monetary policy needs to have full concentration on the US economy; any changes and

instabilities there affect our economy very badly. The best risk hedging ways to have different policies from the monetary policy that helps banks and corporations. But those policies need to be close to the US policies, because of the pegging, SAMA doesn't have much control on coming up with new policies.As conclusion, all factors (loans, savings and GDP) are affected with the interest rate fluctuations. The best way is to have future predictions, monitoring the market changing and trying to cope fast to the changes. Having any delays in the business can affect the corporations negatively. In the end, lower any risk for the corporations depend highly on the policies implemented by the Monetary Policies (SAMA and Fed Reserve). This impacts any country that has their private sector controlling the economy to decline in its aggregate demand.

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