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Can banks survive in zero interest rate era?

Abstract

Although there are many different reasons for the occurrence of economic crises, the economists use the decline of interest rate as a conjoint treatment to get out of these crises. After the last economic crisis, interest rates reached near zero percent, raising a question: Can banks survive with zero interest rate? This requires changing the nature of banks' behaviors from house of deposits to house of Investment. This paper proposes a model to let banks work without using bank interest rates. This proposal was then tested by applying the proposed model to one of the Egyptian banks and comparing the results with the present status. The research finds that all parties have positive benefits, which open the door to finance a lot of projects that support economic development plans. At the same time, it may comply with the principles of Islamic economics.

Keywords: near zero interest rate, zero interest rate, rate of return, banking behavior.

JEL Classification: E43, G12, G21, G24.

Introduction

Ten years ago, it was unthinkable that banking interest rates would sink to a one percent level. However, each global financial crisis the world witnessed since 1929 caused a collapse of investments, market weaknesses, frailties in the financial system, increased systemic risks, and drop of asset values causing a loss in consumer confidence and a sharp slowing-down in global economic activity after the global financial crisis. Moreover, increase the credit risks along with the increase of the charges on investors as a result of Shrinkage credit policy, pushed down the spreading of credits to unprecedented levels. Regardless of the reasons that have led to a global financial crisis, which led to a decline in investments and economic indicators, lowering interest rates to approach near zero level, all this invited us to pause and think about the appropriate economic policies necessary to deal with such a situation. After each global financial crisis all monetary and banking policies adopted a near zero interest rate policy until it became a reality in the global economy. This is what raises questions, is it possible for banks to work efficiently under zero interest rates or near zero interest rates? How can banks attract deposits and use them without using interest rates as an engine to attract these funds?

This paper is structured as follows. Section 1 reviews previous studies. Section 2 is for methodology. Section 3 presents for the results of the two models. The final section concludes the study.

1. Literature review

1.1. Interest rate in economic thought. Interest rates concept differs depending on Economists ideology, Adam Smith, Ricardo and Marshall define it as "the price of using the capital resulting from real savings sacrifice". But, they didn't differentiate between interest and profit. Cassel, Fisher and Walras define it as the price, which achieves a balance between invest-

ment and saving. While, Keynes defines it as: a price that balances between the desire of holding wealth in the form of cash, and the available quantity of cash. But, the common definitions of interest rate is the price paid by a borrower for using money that they borrow from a lender for the agreed period of time.

Interest rate plays an important role in economy as a lender and borrower indicator which influences saver and investor behavior. (Bikbov, Ruslan and Chernov, 2013; Huang and Ratnovski, 2011; Woodford, 2003; Taylor, 2010).

1.2. Interest rate role as treatment tools in economic crisis. In this paper we will not discuss the historical reasons of economic crises but we'll discuss the role of interest rates as one of the treatment tools to get out of it. During the Great recession of 1929, the Keynes Effective demand theory was the most important way to get out of this crisis. It depended on two axes. First: increase governmental investments spending, which led to increase the effective demand. Second: the Federal Reserve cut the short-term nominal interest rate from 5% in 1929 to 0.5% in late 1932. The decrease of interest rates made investment gain higher than bank deposits gains which led to a reduced loan's interest rate and cost of creating investment resulting in employing the money in production (Samanta, 2011; Shen, 2013). During the East Asian crisis of 1997, the main problem in East Asian crisis treatment was the prescription of the "IMF", which was based on: 1. Applying a contractionary fiscal policy by reducing government spending and adopting higher taxes. 2. Applying contractionary monetary policy by raising interest rates to attract foreign capital and lowering exchange rates. (Mishkin, 1999; Mitton, 2002). However, it was noticed that this policy was inadequate, due to persistence of high interest rates for a long time that led to a recession in the real economy (Gavin, 1996). Although the IMF stressed that the benefits of raising banking interest rates will exceed the costs and it is a strategic inescapable choice. But, there are many academic studies confirming that the higher interest rates would have negative effects on

real economy and lead to an increased risk of insolvency and failing in repaying debts. From the practical experience in the East Asian crisis it became clear that the treatment of IMF is not a suitable solution for East Asian economic structures and it shows that there is a weak relationship between high interest rates and exchange rates of local currency in the early months of the financial crisis, and then it backs down after that indicating that the lower interest rate was responsible for influencing the recovery of the economy and restoring confidence (Furman, Stiglitz, Bosworth & Radelet, 1998).

During the Internet companies bubbles Crisis of 2000, stock prices fell sharply when technology parameters in the NASDAQ stock exchange collapsed, which led it to a decline of about 78%. So, the U.S. Federal Reserve cut the interest rate from 6.25 to be 1% as a treatment to shares' collapsed value and support economy in order to prevent entering a spiral recession (Razin, 2013). During the International financial crisis of 2008: when banking system did not follow standard banking rules by creating forms of virtual investment represented of resecuritization of bad debts through (Fannie Mae and Freddie Mac), which have carried out the re-display of this debt to the public as excellent low-risk financial assets by using easy credit policy. This led to the collapse of the credit market and the stock market and the American economy, followed by the collapse of the major world economies, which are tied by mutual relations with the American economy. And here again, the economists lowered the interest rates to be near zero interest rate as the most important steps in crisis treatment (Jaffee, 2008; Taylor, 2009).

As we have noted in previous economic crises: lowering the interest rates may play an important role to get out of this crisis. Because lowering interest rate has a positive reaction in economic analysis by encouraging lending; while the ability to drive consumption and investment for aggregate demand strengthening and achieving economic goals. Especially the crisis we are witnessing these days, where the U.S. Federal Reserve reduced the interest rate to be near zero (Doh, 2013). This makes us wonder how we can manage zero interest rate. In addition, Japanese economy had a successful experience with zero interest rate. In Depression era, Bank of Japan cut nominal interest rates in the short term in response to the weakened economy. By the second half of 1995, the 3-month government rate was essentially around zero. Although the decline in interest rates was too slow to prevent inflation from turning into deflation, the rate of real interest of 5% in late 1990 dropped to 3% in 1993 then 1% or less in 1995, 1996 and 1997, respectively (Adam and Billi, 2006). The Japanese authorities have already confirmed the importance for banks to establish more

sophisticated processes to check and monitor their customers, especially in the field of business abroad. With the Bank of Japan's new measures in place, banks faced another round of interest margins to decline. Although the sector has become used to an environment of low interest rates, and the renewal of quantitative easing policy posed new challenges for business models that established Japanese banks (Lai and Teng, 2013).

1.3. How can we manage zero interest rate? We must change the pattern of the various parties' performance in the banking process. Depositors will need to become indirect investor, borrowers will become direct investor and the banks will change from a Deposit house to an Investment coordinator. This gathers the three parties together in a new contract. This new contract brings those parties to a partnership agreement where the depositors accept the results of the gain or loss of business, and the borrower becomes a direct partner investor: his first task will be to optimize the performance to achieve the maximum profit possible and overcome obstacles to the market. In this case bank role will change to investigate and examine investment opportunities and investigate the seriousness of investor who will lead the company. The bank depositors will go to the more efficient banking institution in selecting investment projects and investigate the business investors. The bank depositors will not go to the bank that lose investment projects and/or make lesser total profits than other banks as a result of lack of investigation and examination of Investment Partnership and investment opportunities.

2. Methodology

2.1. Method. In this research a case study approach is used as the research methodology. The literature suggested that case studies are best to answer the "how" and "why" research questions asked about a contemporary phenomenon within a specific real-life context (Yin, 2003). This approach was regarded the best method to delve deeply to understand a given phenomenon in more detail. Before starting the case study the nominal and real interest rate during study period were analyzed and compared. The interest rate data published in CBE web site as per (Appendix A, Table 1) shows that the nominal interest rate is not even close to zero, which it is ranging from 6% to 10% on various types of deposits during the period under study (2003 to 2011), while the real interest rate is a negative interest not even zero. Thus, the depositors losing they won capital although they receive a high interest rate. Figure 1 shows the fluctuation of nominal interest rate but always positive for all type of deposit, treasury bills and loans.

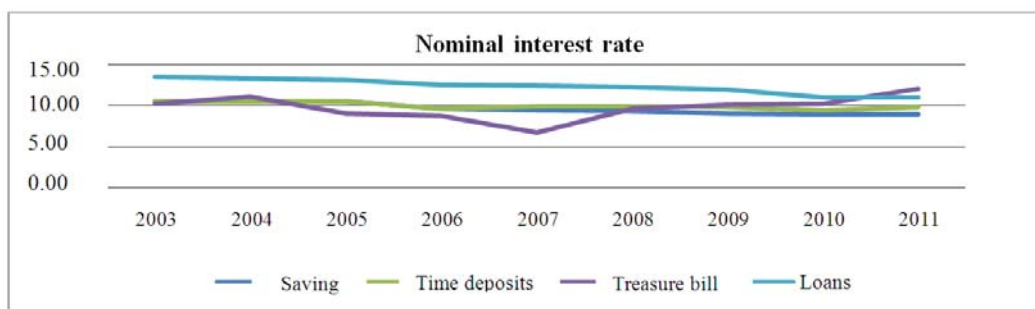


Fig. 1. The nominal interest rate structure in study period

Figure 2 shows that in year 2003 the real interest rate was positive for all type of deposit and treasury bills but it turned to be negative interest rate for all type of deposit and treasury bills and back to be positive in 2005, then it decreased to be negative

since 2006 till now except treasury bills which start to be positive in 2010 and 2011. While the loan real interest rate is always positive in all years but it turned to be negative in 2011 although it reach zero in 2007.

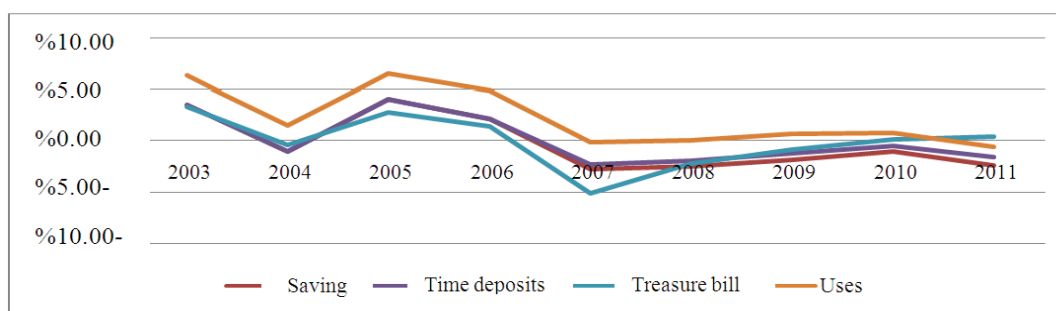


Fig. 2. The real interest rate fluctuations in the study period

We should notice that current deposits accounts do not count any interest in the current system or the proposed model.

2.2. The current model used by banks with interest rate (see Appendix B for definitions). In the current bank model, banks used to be a house of deposits, taking deposits from depositors (sources) and lend them to borrowers (uses) therefore banks make the profits from the difference. This can be explained as followed:

- a) Bank sources according to this model are current accounts, saving accounts and time deposits.
- b) Bank uses according to this model are line of credit, over draft, loans and T-bill.
- c) Banks benefit from the difference between what banks collect from the borrowers and what the banks pay to the depositors.

2.3. A proposed model of how banks work without interest rate (see Appendix B for definitions).

- a) Bank sources consist of accounts with no returns (Current account and Social solidarity account) and accounts with returns (Saving Account, rapid Investment account and Investment account);
- b) Bank uses consist of non-investment loans, partner investment (direct investment) and investment (Indirect Investment);

- c) Banks' benefits are from what they get as per partnership agreement between the three parties.

In proposed model Bank is responsible for banking development awareness in the community and creates mechanisms to prevent cash leakage from the banking system. Bank's role does not stop in granting loans, and investment posts, but extends it to provide the necessary technical assistance to the borrower (investor partner) to be able to develop its work and its operations.

3. Results and discussion

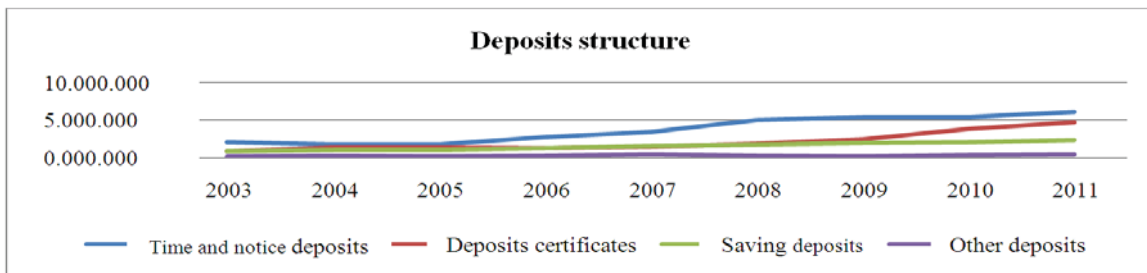
When using the zero interest rate policy, the financial system loses investment tools with interest, such as government bonds which we consider it yield risk free, thus, capital market contain the risky investment tools only. In the proposed model, we can differentiate between two types of financial assets: Financial assets based on partnerships which have high-risk and low liquidity. Financial assets based on mutual fund of shares and bonds, which have varying degrees of low risk and high liquidity. From this point, we proposed converts the banking system units from being house of deposits to be business organizer and coordinator of projects house of investment. So, we replace the reliance on interest rate as an engine for the banking system performance to rely on the rate of return (ROR)¹, as result from a true partnership between depositors, borrowers and the

bank, thus depositor becomes silent investor and borrower becomes worker investor and bank coordinator and consultant.

3.1. Current model. To apply the current mechanism without any change, the Commercial International Bank was selected because it is one of the most well-known Egyptian banks and has approved and published financial balance sheet data for the study period. We chose this period because it covers two crises: the international financial crisis of 2008 and the Jan 25th, 2011 revolution.

In our analysis we assume that any account with interest and has no time period to be as a saving account

and any account with interest and has a time period such as deposit certificate to be as a time deposit. By looking at the deposits structure, we find that it consists of time deposits & deposits certificates (medium and longterm investment) and saving & other deposits (shortterm investment). As shown in Figure 3 Time deposits are the highest type in deposit which represents 38% to 55% from total deposits. Then saving deposits & deposits certificates represent same ratio from 2003 to 2008 fluctuated between 21% and 31% from total deposits. Starting from 2009 deposits certificates increased to reach 34% from total deposits while saving deposits decreased to reach 17% from total deposits (see Appendix A, Tables 2 & 3).



Note: Risk premium is the difference between TB as zero risk investment and interest rate for loan. Risk rate is the percentage of Risk premium in the interest rate for loan. Determining the average rate of return on invested capital in Egyptian economy through analyzing 75 companies financial balance sheet in different economic sectors. Rate of return without risk = Rate of return nom * (1- Risk rate). Bank Margin = interest rate collected from loans – interest rate paid for deposit. Then calculate risk free rate of return by subtract business risk from rate of return.

Fig. 3. The deposits structure in study period

Figure 4 shows what is saving depositor earn by using nominal interest rate and real interest rate paid from the bank to depositors. Although the nominal

return rate is positive but the real return was negative which means that the losing their capital when they save in banks (see Appendix A, Table 2).

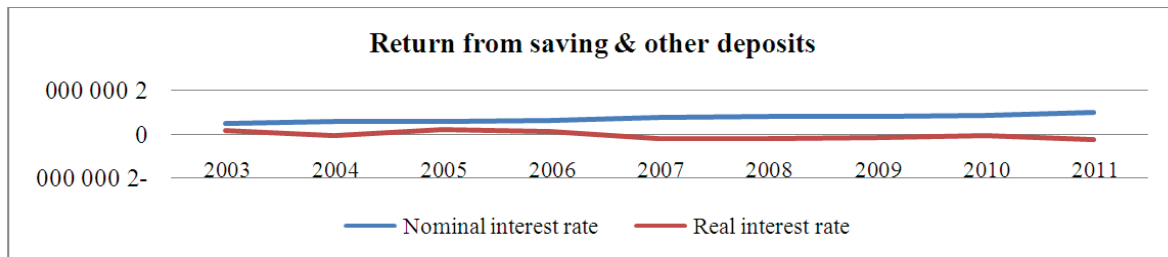


Fig. 4. The return from saving & other deposits

Figure 5 shows the defiance of time deposits return by using nominal interest rate and using real interest rate paid from the bank to depositors. Also as same as saving, the time deposits nominal re-

turn is positive rate but the real return was negative which mean the losing their capital when they put it in time deposit form. (see Appendix A, Table 3).

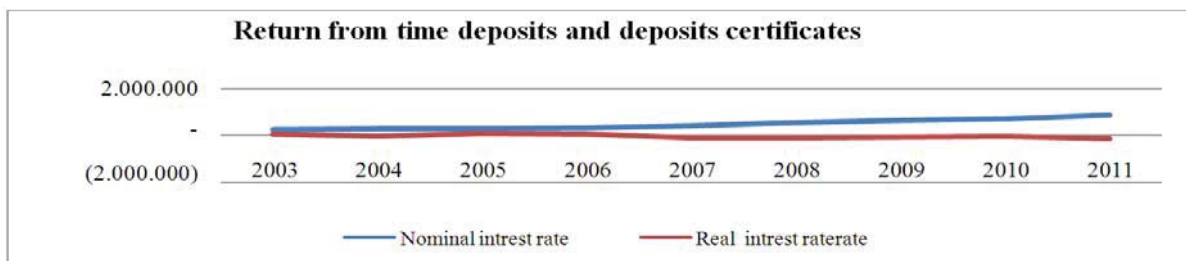


Fig. 5. The return from time deposits and deposits certificates

By analyzing bank uses structure, it was consisting of treasury bills and loans & overdrafts to customer & banks which is the main resource to bank income. As shown in Figure 6 loans & overdrafts to customer are the highest type uses which represent 67% to 84% from total uses.

Then treasury bills represent about 9% to 31% from total uses. We noticed that treasury Bills start to increase from 2007 to reach 31% from total uses at 2009; while loans & overdrafts to bank was very minimal. (see Appendix A, Tables 4&5).

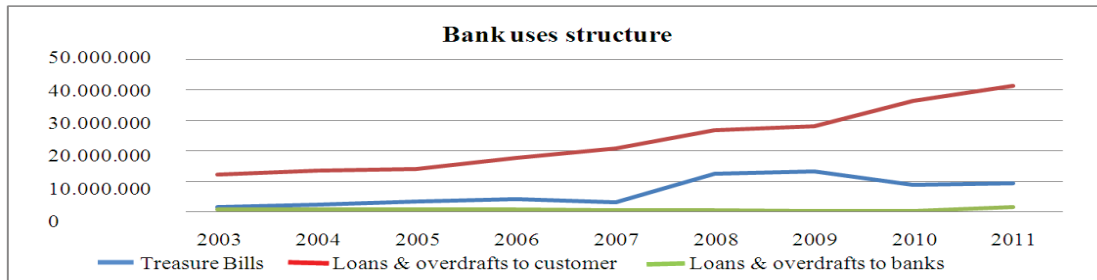


Fig. 6. Bank uses structure in study period

Figure 7 shows the defiance of treasury bills return by using nominal TB rate and using Real TB rate paid from the government to banks. It has positive return when we calculated in nominal rate but this

return comes to zero when we calculated in real rate and being negative in year 2006 to 2009. In this case we should wandering why bank invest in such losing tools? (see Appendix A, Table 4).

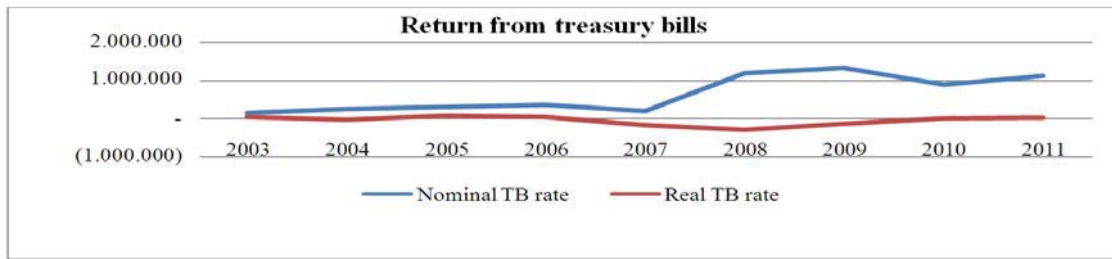


Fig. 7. The return from treasury bills

Figure 8 shows the defiance of total loans & overdrafts return by using nominal rate and real rate

paid from the borrower to banks. (see Appendix A, Table 5).

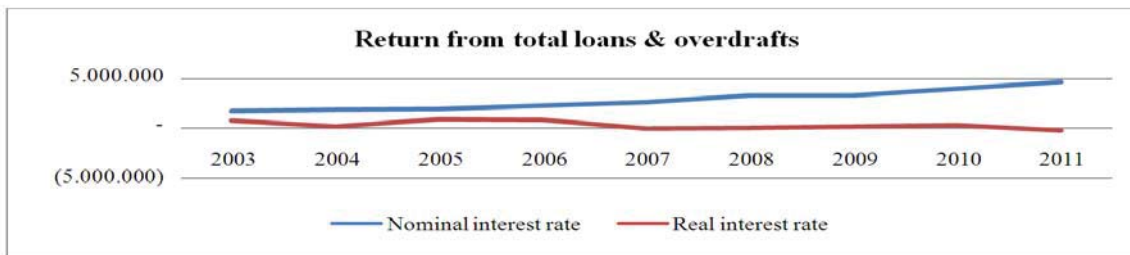


Fig. 8. The return from total loans & overdrafts

By analyzing the bank income and bank benefits, bank income is the difference between what bank paid to the depositor and what a bank received from government and borrower. Bank margin is the percentage

of bank income to total bank uses. As shown in Figure 9 bank margin fluctuated between 2.12% to 6.37% in nominal measure and 1.21% to 2.96% in real measure. (see Appendix A, Table 6).

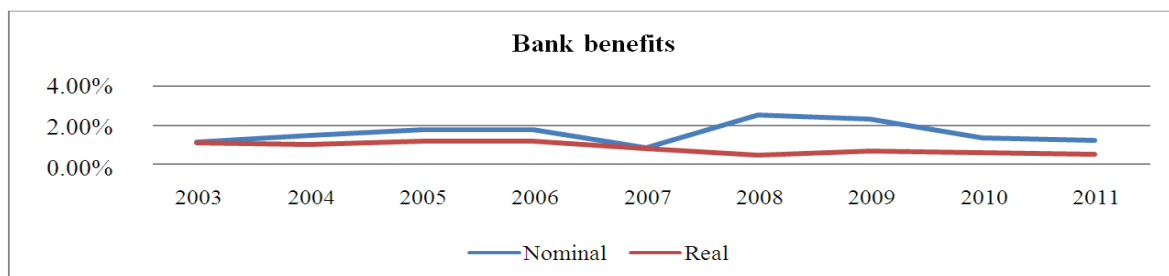


Fig. 9. The nominal and real bank benefits

3.2. Proposed model. By applying the proposed model using the same data with changing mechanism. Before applying the proposed model we assumed that:

- ◆ The individual will be affected by the potential returns and the expected risks associated with the return when offering his savings or looking for credit.
- ◆ Savers hate risks, so expect a higher return when risk increases, which means credit supply is increasing function of risk.
- ◆ The capital market is dominated by perfect competition, which means there is no monopoly; there is no cost for the financial transactions determining the average rate of return, risk free rate of return and real risk free rate of return as per Table 1.

Table 1. Bank income and bank margin real interest rate (see Notes)

	Treasury bill rate		loans	Risk premium		Rate of return			
	Inflation	Treasury bill rate		Loans	Risk	Risk	Rate of return	Rate of return without risk	
	%	Nominal %	13.54	%	%	%	%	Nominal %	Real %
2003	6.78	10.27	13.36	13.54	3.27	29.68	29.68	22.52	15.74
2004	11.67	11.15	13.13	13.36	2.21	21.64	21.64	18.05	6.38
2005	6.21	9.06	12.60	13.13	4.07	30.79	30.79	21.25	15.04
2006	7.36	8.84	12.51	12.60	3.76	62.26	62.26	43.70	36.34
2007	12.60	6.78	12.23	12.51	5.73	66.40	66.40	36.00	23.40
2008	12.20	9.68	11.98	12.23	2.56	58.77	58.77	46.48	34.28
2009	11.17	10.16	11.01	11.98	1.82	35.26	35.26	29.90	18.73
2010	10.11	10.22	11.03	11.01	0.79	40.12	40.12	37.25	27.15
2011	11.67	12.10	0.43	11.03	-1.06	31.91	31.91	34.98	23.32

Notes: The rate of return (ROR) is a gain obtained as a result of investments in real projects. Thus, the real return change according to market fluctuations, management efficiency and we cannot determine it in advance. As per economic literature, rate of return is the benefit obtained by the individuals who invest their surpluses with others. There was a debate between economists about the effects of cancel interest rate and use the rate of return in macroeconomic and microeconomic analysis. Some of them see that economy cannot work without an interest rate as engine of economy, some others see that interest rate is one of the economic crises reasons and we should change the economic way to rate the return because it represents the return of real economy. Chabra denied the negative effects of canceling the interest rate on the economy. He concluded his analysis; that canceling interest rate in economy will not affect the optimal allocation of resources. He also concluded that the canceling of interest rate would not affect the savings and capital accumulation, because studies have shown a weak relationship between interest rates and savings (compared with other factors more influential such as political and economic stability) (Trabelsi, 2011). While Nadeem ElHaq and Abbas Mirakhor, did not agree with economists who claim that the abolition of interest rate will increase risk of savings revenue which lead to reduce it, they justify their disagreement, based on the assumption that the return on savings will remain constant with increasing the risk rate of investment by partnerships; this is not true because, the high risk will be accompanied with high rate of return. (Johnson and Neave, 1996).

Now we will change the relation between the three parties from depositor, borrower and house of deposit to be silent investor, worker investor and house of investment. This partnership works as the following Current account and Social solidarity account will not count any benefits in proposed model. Saving account will be invested in mutual funds and will divide the profit to 70% silent investor and 30% house of investment (bank) (see Appendix A, Table 8). Investment account will divide the profit to 35% worker

investor, 35% silent investor and 30% house of investment (bank) (see Appendix A, Tables 9&10).

3.3. Comparing the current model with the proposed model. Figure 10 shows the nominal and real comparison between saving in the two mechanisms. It shows that the nominal customer return of ROR is positive and higher than the return from interest rate. While the return from real interest rate is negative, the real customer return of ROR is positive and in year 2005 was equal to return from nominal interest rate.

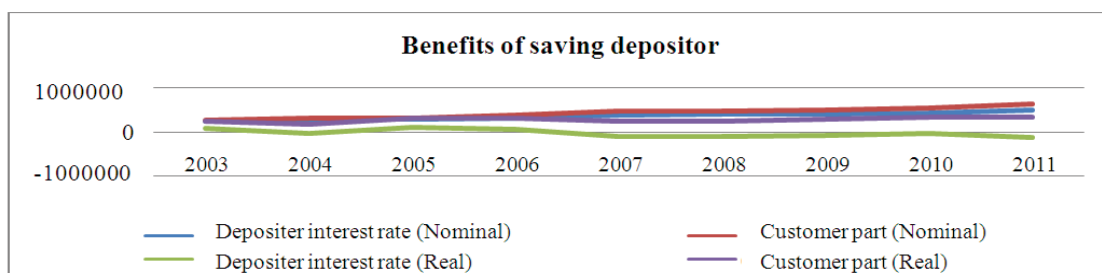


Fig. 10. The nominal and real return of saving depositor

Figure 11 shows the nominal return comparison between time deposits in two mechanisms. It shows that the nominal borrower return of interest rate is positive and higher than the return from

worker investor part of ROR. While the return from nominal silent investor part of ROR is positive and higher from depositor nominal interest rate.

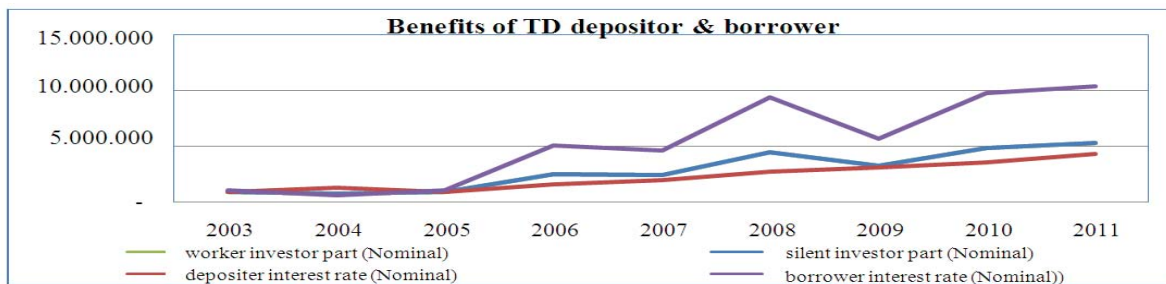


Fig. 11. The nominal return comparison between time deposits in two mechanisms

Figure 12 shows the real return comparison between Time deposits in two mechanisms. It shows that the real borrower return of interest rate is positive and higher than the return from worker investor part of

ROR. While the return from real interest rate is negative since 2006, the real customer return of ROR is positive.

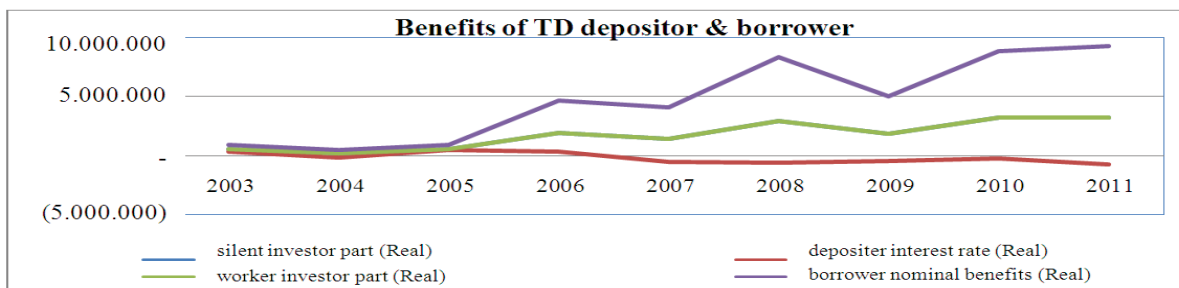


Fig. 12. The real return comparison between time deposits in two mechanisms

Figure 13 shows the nominal and real comparison between bank benefits in two mechanisms. It shows that the bank benefits from nominal ROR mechanisms is positive and higher than bank benefits from nominal interest rate mechanisms. While the bank

benefits from real interest rate mechanisms is negative, the bank benefits from real ROR mechanisms is positive and higher than bank benefits from nominal interest rate mechanisms in some years (2006, 2007, 2010 and 2011). (See Appendix A, Table 11).

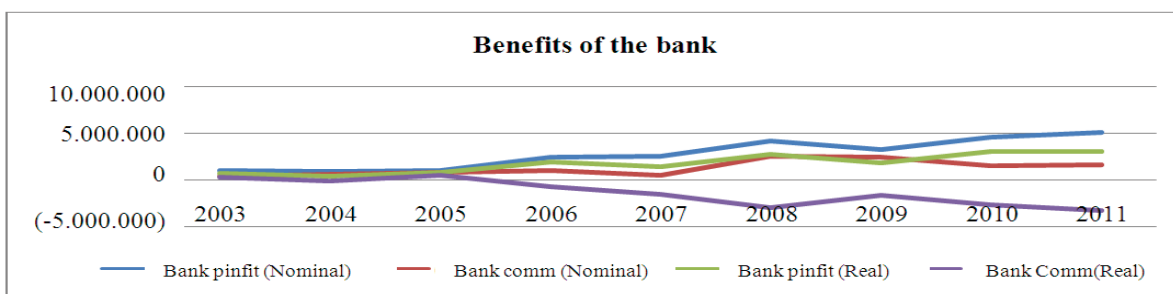


Fig. 13. The nominal and real return of bank benefits in two mechanisms

From all above we can see that saving deposits customer in the proposed model gained more benefit in nominal and real calculation. Time deposit customer in the proposed model gained more benefit in nominal and real calculation. Borrower in the proposed model gained less benefit in nominal and real calculation but still in positive said. Bank in the proposed model gained more benefit in nominal and real calculation. In general all parties have a positive benefit, which open the door to finance a lot of projects to support the economic development plane.

Conclusion and recommendations

After reviewing recent economic crises, it becomes clear that lowering interest rates is the appropriate treatment that is used by economists to get out of each economic crisis from the beginning of the Great Depression of 1929 till the current global financial crisis. When interest rate reaches zero level, monetary policy loses one of its most important tools to control the economy. Thus, banking system loses the most important tool, which is its ability to collect money from

depositors without given them any benefits, also losing its ability to finance and lend money to borrower, thus, loses its ability to make a profit, which means the loss of its ability to survive. In addition, fiscal policy loses one of the most important tools where they lose government bonds and treasury bill attraction without any interest back for individuals. For this situation, it was necessary to change the behavior of the banking system units to comply with the new changes of zero interest level. From this point, this paper proposes to convert the banking system units' role from being house of deposits to be business organizer and coordinator of projects (house of investments). So, we replace the reliance on interest rate as an engine for the banking system performance to rely on the rate of return, as a result from a true partnership between depositors, borrowers and the bank, thus depositors become investors and borrowers become investors as well and bank(s) become the coordinator(s).

The study compared the application of the currently used mechanism and the proposed mechanism model on one of the most reputable Egyptian banks (Commercial International Bank) and found that the depositor in the proposed model gained more benefit in no-

minimal and real calculation. Borrower in the proposed model gained less benefit in nominal and real calculation but still in positive side. The bank in the proposed model gained more benefit in nominal and real calculation. This indicates that adopting the proposed model will give all parties a positive benefit, and the banks can survive with zero interest rate era. Interestingly enough, we find that the policies used to get out of the economic crises are consistent with the principles of Islamic finance where Islam takes a definitive stance preventing interest rate from the beginning and forbidding all people to deal with it. On the other hand, Islam does not forbid the rate of return. It gives the right of capitalist in some of the profits earned by the borrower as a result of the use of money lender, but on the basis of the participation of money owner and investor in the profits, and to link the right of capitalist to the economic process results. Therefore, it did not recognize the interest rate but recognized the method of Participation, partnerships and Murabaha in the banking system. This indicates that the Islamic economic theory is the way economists use to get out of economic crises, even if they do not mention the source.

References

1. Adam, K. and R. Billi (2006). Optimal monetary policy under commitment with a zero bound on nominal interest rates, *Journal of Money, Credit and Banking*, pp. 1877-1905.
2. Bikbov, Ruslan and Mikhail Chernov (2013). Monetary policy regimes and the term structure of interest rates, *Journal of Econometrics*, pp. 27-43.
3. Doh, Taeyoung. (2013). Long-run risks in the term structure of interest rates: estimation, *Journal of Applied Econometrics*, 28.3, pp. 478-497.
4. Gavin, Michael and Ricardo Hausmann (1996). The roots of banking crises: the macroeconomic context, *Banking Crises in Latin America*, pp. 27-63.
5. Huang, Rocco and Lev Ratnovski (2011). The dark side of bank wholesale funding, *Journal of Financial Intermediation*, 20.2, pp. 248-263.
6. Jaffee, Dwight (2008). The interest rate risk of Fannie Mae and Freddie Mac, *Journal of Financial Services Research*, pp. 5-29.
7. Jason Furman, Joseph E. Stiglitz, Barry P. Bosworth and Steven Radelet (1998). Economic Crises: Evidence and Insights from East Asia Brookings Papers on Economic Activity, Vol. 1998, No. 2, pp. 1-135.
8. Johnson, L.D. and E.H. Neave (1996). Efficiency and Effectiveness of Islamic Finance: The Cost of Orthodoxy, Working Paper No. 96-26, Queen University, Kingston, Ontario, Canada.
9. Lai, P.Y. and J. Teng (2013). Five Policy Options in Face of Euro Crisis. *Journal of Global Economy*, 1, e101.
10. Mishkin, Frederic S. (1999). Lessons from the Asian crisis, *Journal of International Money and Finance*, 18.4, pp. 709-723.
11. Mitton, Todd (2002). A cross-firm analysis of the impact of corporate governance on the East Asian financial crisis, *Journal of Financial Economics*, 64, p. 216.
12. Razin, Assaf. (2013). Understanding Global Crises: Lecture Notes.
13. Samanta, Subarna. (2011). Measuring the Impact of an Interest on Reserves Regime on Monetary Policy Effectiveness: Evidence from New Zealand. Shen, Yue. Booms, bubbles and crashes. Queen's University, 2013.
14. Taylor, John B. (2009). The financial crisis and the policy responses: An empirical analysis of what went wrong. No. w14631. National Bureau of Economic Research.
15. Taylor, Lester D. (2010). *Interest and Money. Capital, Accumulation, and Money*. Springer US, pp. 31-48.
16. Trabelsi, M.A. (2011). The impact of the financial crisis on the global economy: can the Islamic financial system help? *Journal of Risk Finance*, pp. 15-25.
17. Woodford, M. (2003). *Interest and prices: Foundation of a theory of monetary policy*. Princeton University Press.
18. Yin, R.K. (2003). Case Study Research. Design and Methods Second edition Thousand Oaks: Sage.

Appendix A

Table 1. The nominal and real interest rate

	1	2	3	6	7	8	9	10	11
	Inflation1	Saving		Time deposits		Treasury bill		Loans	
		Nominal2	Real3	Nominal2	Real	Nominal	Real	Nominal	Real
2003	6.78	10.50	3.49%	10.50	0.0349	10.27	0.0327	13.54	0.0633
2004	11.67	10.50	-1.05%	10.50	-0.0105	11.15	-0.0047	13.36	0.0152
2005	6.21	10.50	4.04%	10.50	0.0404	9.06	0.0268	13.13	0.0652
2006	7.36	9.67	2.15%	9.67	0.0215	8.84	0.0138	12.60	0.0488
2007	12.60	9.50	-2.75%	9.96	-0.0234	6.78	-0.0516	12.51	-0.0008
2008	12.20	9.38	-2.52%	10.00	-0.0196	9.68	-0.0225	12.23	0.0003
2009	11.17	9.13	-1.84%	9.83	-0.0120	10.16	-0.0091	11.98	0.0072
2010	10.11	9.00	-1.01%	9.50	-0.0055	10.22	0.0010	11.01	0.0082
2011	11.67	9.00	-2.39%	9.88	-0.0160	12.10	0.0038	11.03	-0.0057

Note: Inflation rate as per published in (WDI) World Bank database. Nominal rate is the average rate published in CBE Publication. Real is Nom rates without inflation rate = $(1 + \text{nom} / 1 + \text{inf}) - 1$ by fisher.

Table 2. The interest paid from the bank to depositors by nominal and real interest rate

	Saving & other deposits	Nominal interest rate		Real interest rate	
2003	4.651.350.95	10.50%	488.391	3.49%	162.160
2004	5.526.583.20	10.50%	580.291	-1.05%	-57.899
2005	5.413.661.12	10.50%	568.434	4.04%	218.522
2006	6.539.877.65	9.67%	632.188	2.15%	140.513
2007	8.347.565.15	9.50%	793.018	-2.75%	-229.510
2008	8.469.636.41	9.38%	794.028	-2.52%	-213.544
2009	8.876.460.68	9.13%	809.977	-1.84%	-163.460
2010	9.601.750.64	9.00%	864.157	-1.01%	-96.579
2011	11.173.126.48	9.00%	1.005.581	-2.39%	-266.691

Table 3. The interest paid from the bank to depositors by nominal and real interest rate

	Time deposits and deposits certificates	Nominal interest rate		Real interest rate	
2003	11.423.775	10.50%	1.199.496	3.49%	398.266
2004	12.241.885	10.50%	1.285.398	-1.05%	-128.252
2005	12.536.934	10.50%	1.316.378	4.04%	506.053
2006	16.223.524	9.67%	1.568.274	2.15%	348.571
2007	19.580.556	9.96%	1.949.897	-2.34%	-458.649
2008	27.341.904	10.00%	2.734.190	-1.96%	-537.068
2009	31.475.784	9.83%	3.095.119	-1.20%	-379.078
2010	37.099.308	9.50%	3.524.434	-0.55%	-204.693
2011	43.352.749	9.88%	4.281.084	-1.60%	-695.076

Table 4. The interest received from the government by nominal and real interest rate

	Treasury bills	Nominal interest rate		Real interest rate	
2003	1.446.000	10.3%	148.504	3.27%	47.297
2004	2.353.750	11.15%	262.396	-0.47%	-11.001
2005	3.195.900	9.64%	308.085	2.68%	85.794
2006	4.149.925	8.84%	366.978	1.38%	57.325
2007	3.033.300	6.78%	205.688	-5.16%	-156.648
2008	12.449.007	9.68%	1.204.441	-2.25%	-280.590
2009	13.198.961	10.16%	1.340.486	-0.91%	-120.653
2010	8.821.004	10.22%	901.683	0.10%	9.172
2011	9.260.812	12.10%	1.120.095	0.38%	35.634

Table 5. The interest received from borrower to the bank by nominal and real interest rate

	Total loans & overdrafts	Nominal interest rate		Real interest rate	
2003	14.471.596	13.54%	1.959.092	6.33%	916.196
2004	16.634.546	13.36%	2.222.791	1.52%	252.131
2005	18.101.422	13.13%	2.377.169	6.52%	1.179.310
2006	22.522.068	12.60%	2.837.781	4.88%	1.099.256
2007	24.431.251	12.51%	3.055.942	-0.08%	-18.966
2008	39.660.816	12.23%	4.851.840	0.03%	10.374
2009	41.481.995	11.98%	4.967.469	0.72%	299.538
2010	45.537.656	11.01%	5.012.937	0.82%	372.558
2011	52.193.946	11.03%	5.758.732	-0.57%	-295.405

Table 6. The bank income and bank margin

	Nominal				Real			
	Total bank pied	Total bank received	Bank margin		Total bank pied	Total bank received	Bank margin	
2003	1.687.888	2.107.596	419.708	2.90%	560.426	963.493	403.067	2.79%
2004	1.865.689	2.485.187	619.498	3.72%	(186.151)	241.131	427.282	2.57%
2005	1.884.813	2.685.254	800.441	4.42%	724.575	1.265.103	540.528	2.99%
2006	2.200.462	3.204.758	1.004.296	4.46%	489.084	1.156.581	667.497	2.96%
2007	2.742.916	3.261.630	518.715	2.12%	(688.159)	(175.613)	512.546	2.10%
2008	3.528.219	6.056.281	2.528.062	6.37%	(750.612)	(270.216)	480.395	1.21%
2009	3.905.096	6.307.955	2.402.860	5.79%	(542.538)	178.885	721.423	1.74%
2010	4.388.592	5.914.620	1.526.028	3.35%	560.426	381.730	683.001	1.50%
2011	5.286.665	6.878.827	1.592.162	3.05%	(186.151)	(259.771)	701.995	1.34%

Table 7. The average of rate of return of mutual funds

MF types	
Balanced	23.18
Equity	23.92
Money market	9.40
Fund of the funds	14.81
Islamic sharia compliant	19.12
Asset allocator	17.46
Private equity	12.64
Fixed income	9.60
Average of rate of return for total mutual funds	16.27

Table 8. The nominal and real ROR for saving deposits in proposed mechanisms

	Saving & other deposits	ROR from MF (Nominal) %	ROR from MF (Nom)	ROR from MF (Real) %	ROR from MF (real)	ROR from MF (real)	Customer part (Nom) 70%	Bank part (Nom) 30%	Customer part (Real) 70%	Bank part (Real) 30%
2003	488391.8	0.1627	756.775	0.1492	693.868	693.868	529.742	227.032	485.708	208.160
2004	580291.2	0.1627	899.175	0.0873	482.567	482.567	629.423	269.753	337.797	144.770
2005	568434.4	0.1627	880.803	0.1626	880.190	880.190	616.562	264.241	616.133	264.057
2006	632188.2	0.1627	1.064.038	0.1375	899.213	899.213	744.827	319.211	629.449	269.764
2007	793018.7	0.1627	1.358.149	0.0810	676.311	676.311	950.704	407.445	473.418	202.893
2008	794028.4	0.1627	1.378.010	0.0836	707.786	707.786	964.607	413.403	495.450	212.336
2009	809977	0.1627	1.444.200	0.0911	808.953	808.953	1.010.940	433.260	566.267	242.686
2010	864157.6	0.1627	1.562.205	0.1006	965.584	965.584	1.093.543	468.661	675.909	289.675
2011	1005581	0.1627	1.817.868	0.0874	975.985	975.985	1.272.507	545.360	683.189	292.795

Table 9. The nominal comparison between time deposits in two mechanisms

	Time deposits	ROR %	ROR (Nom)	silent investor part (Nom)	depositor interest rate (Nom)	worker investor part (Nom)	borrower nominal benefits (Nom)	Bank part (Nom)	Bank comm (Nom)
2003	11423775	22.52%	2.572.205	900.272	899.496	900.272	1.026.141	771661	419708
2004	12241885	18.05%	2.210.115	773.540	1.285.398	773.540	573.838	663034	519498
2005	12536934	21.25%	2.664.241	932484	932474	932.484	1.017.686	799272	600441

Table 9 (cont.). The nominal comparison between time deposits in two mechanisms

	Time deposits	ROR %	ROR (Nom)	silent investor part (Nom)	depositor interest rate (Nom)	worker investor part (Nom)	borrower nominal benefits (Nom)	Bank part (Nom)	Bank comm (Nom)
2006	16223524	43.70%	7.088.974	2481141	1568274	2.481.141	5.045.516	2126692	1004296
2007	19580556	36.00%	7.048.349	2466922	1949897	2.466.922	4.599.799	2114505	518715
2008	27341904	46.48%	12.708.392	4447937	2734190	4.447.937	9.363.691	3812518	2528062
2009	31475784	29.90%	9.412.523	3294383	3095119	3.294.383	5.642.034	2823757	2302860
2010	37099308	37.25%	13.821.050	4837367	3524434	4.837.367	9.735.477	4146315	1526028
2011	43352749	34.98%	15.165.006	5307752	4281084	5.307.752	10.381.538	4549502	1592162

Table 10. The real comparison between time deposits in two mechanisms

	Time deposits		ROR (real)	Silent investor part (real)	Depositor interest rate (real)	Worker investor part (real)	Borrower nominal benefits (real)	Bank part (real)	Bank comm (real)
2003	11423775	14.74%	1.683.845	589.346	398.266	589.346	960.607	505154	335067
2004	12241885	5.72%	699.828	244.940	(128.252)	244.940	514.277	209949	127282
2005	12536934	14.16%	1.775.075	621.276	506.053	621.276	958.292	532522	340528
2006	16223524	33.84%	5.490.804	1.921.782	348.571	1.921.782	4.698.967	1647241	667497
2007	19580556	20.78%	4.069.455	1.424.309	(458.649)	1.424.309	4.084.655	1220837	512546
2008	27341904	30.55%	8.352.280	2.923.298	(537.068)	2.923.298	8.345.128	2505684	480395
2009	31475784	16.85%	5.303.459	1.856.211	(379.078)	1.856.211	5.076.175	1591038	721423
2010	37099308	24.65%	9.146.727	3.201.355	(204.693)	3.201.355	8.843.206	2744018	683001
2011	43352749	20.88%	9.051.836	3.168.143	(695.076)	3.168.143	9.297.203	2715551	701995

Table 11. The real comparison between bank benefits in two mechanisms

(nominal)	Bank benefits (nominal)	Bank comm (nominal)	Bank benefits (real)	Bank comm (real)
2003	998.694	419.709	713.314	250.179
2004	932.787	619.498	354.719	-113.588
2005	1.063.513	800.442	796.580	468.524
2006	2.445.904	1.004.297	1.917.005	-760.424
2007	2.521.949	518.715	1.423.730	-1.599.343
2008	4.225.921	2.528.063	2.718.020	-2.988.236
2009	3.257.017	2.402.859	1.833.724	-1.654.838
2010	4.614.976	1.526.029	3.033.693	-2.651.964
2011	5.094.862	1.592.162	3.008.346	-3.268.118

Appendix B

Table 1 (B). The current and proposed model used by banks with interest rate

The current model used by banks with interest rate	Bank resources	Current account	Accounts opened by businessmen and companies, who have a number of regular transactions with the bank, which they can deposit or withdraw any amount at any time without giving any notice by using cheques, which help businessmen and companies to conduct their business transactions smoothly. Bank does not pay any interest on current account but collect some fees.
		Saving account	Accounts opened by individuals to save money and earn interest rate on the cash held in the account for complete month. Bank pays this interest twice a year in 30 June and 31 December. Individuals can withdraw any amount at any time without giving any notice, but they will lose the interest for this amount. This account can be a way to store their cash in a safe place to use it as emergency fund in case of emergency circumstances.
Time deposit	Account opened by individuals to save money for specific period and for specific interest rate, this rate varies depend on the amount and the duration of deposit. Depositor cannot withdraw any amount from his TD account till the maturity of the deposit or with prior notice and being subject of penalties.		
Bank uses	Line of credit	Accounts opened by businessmen and companies, to borrow money for temporary reasons. They pay an interest to bank as long as they borrow the money and stop it when they pay it back.	
	Over draft	It is not an account but a kind of agreement between bank and businessmen and companies to cover their checks drawn in there currant account for a temporary period. They pay an interest to bank as long as they borrow the money and stop it when they pay it back.	
	Loans	Accounts opened by businessmen and companies, to borrow money for specific period and specific interest rate. Against what securities they have and approved visibility study.	
	T-bill	A kind of borrowing the government by buying t- bills against interest rate determine in governmental tenders.	
Proposed model of	Bank resources	Current account	As same as current model used in the bank now.
		Social solidarity account	Account provided by a bank for individuals to receive donations voluntarily - but not a zakah- without any benefit on the cash held in the account. The bank can use the proceeds of this account to help him to carry out its leading social role.

Table 1 (B) (cont.). The current and proposed model used by banks with interest rate

		Saving account & rapid investment account	Accounts provided by a bank for individuals to save money and earn benefit on the cash held in the account depending on the size, duration of the deposits and fluctuation of the stock market and mutual fund. The proceeds of this account used to invest in the mutual fund under the management from bank experience and bank guarantee. Which give depositors the opportunity to withdraw their savings at any time with prior notice for big amount and without prior notice for small amount.
	Bank Uses	Investment account	Account provided by a bank for individuals to save money and earn benefit on the cash held in the account depending on the size, duration of the deposits and fluctuation of the business. Depositor cannot withdraw it before one year at list to get return and benefit of the deposits. This account meets the needs of individuals who wish to increase their savings and looking for better investment gain.
		Non-investment loans	This loan is offered from bank to customers for consumption purposes (non-commercial purposes) on a goodwill basis as long as the customer has deposited it in a savings account for at least 6 months. Where the debtor may not pay an extra amount beyond the principal amount of the loan during a specified period. Borrow an amount must be proportionate with the amount deposited in a savings account and period of deposits. In this case, a savings account works as Solidarity Club participants pass emergency and financial crisis. The bank takes all procedure to ensure that the loan is not using in business matter.
		Partner investor (direct investment)	This is a partnership agreement between the bank and one or more partners, where the Bank is engaged in investment capital and in Profits or loss made are shared between the partners according to the invested capital by each share. The project feasibility study made by the bank and the credibility of the investor (personal security) are the major determinant to accept the investment in the project.
		Investment (indirect investment)	The banks create and manage securities and stock exchange portfolios in a form of mutual funds. In order to ensure minimizing and distribute the risks, that allows the bank getting out in a timely manner and achieving the appropriate gain. In the same time it helps the bank to meet the unexpected withdrawal of depositors with facilitating calculation of gain or loss without future consequences.
	Bank benefits	Is what bank gets as per partnership agreement between the three parties.	