

# Global Knowledge, Local Solutions: Interest Rate and Monetary Policy

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## 1- Interest (or 'Profit') Rate

There are a number of definitions for interest rate. We may distinguish at least two notions: 1) The Real Rate of Interest, and 2) The Nominal Rate of Interest. The Real rate of interest is the return that may be obtained on capital in a zero-inflation environment (or the difference between nominal rate of interest and inflation rate). It has also been defined as the cost of forgoing current consumption for future expenditure in a non-inflationary environment.

The real rate of interest is said to be somewhere between 3 to 5 percent, for all currencies, any where in the world. In a more consumption- oriented culture, it would take closer to 5% to encourage consumers to save rather than spend; whereas in a thrifty culture, it would take no more than around 3% to get the same result.

The Nominal rate of interest is the real rate of interest plus the inflation (I). It is generally agreed that the inflation index does not represent last year's or the current year's rates; but it is rather what the

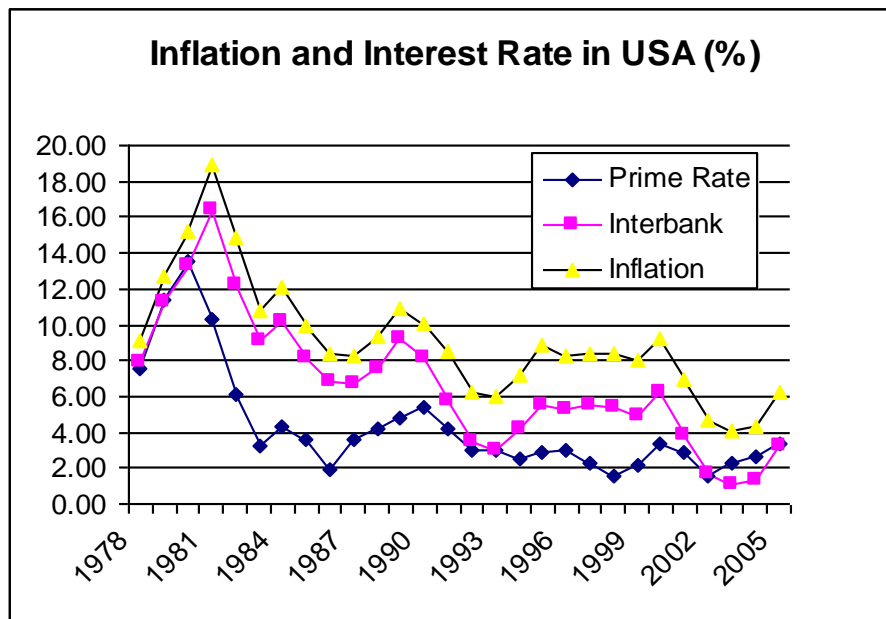
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market expects the rate to be in the future, based on historical data. Accordingly  $i_n = i_r + I + \delta$ , where  $i_n$  is the nominal rate of interest,  $i_r$  is the real rate of interest,  $I$  is inflation, and  $\delta$  represents risk associated with various credit instruments. While sovereign risk in any currency is considered to be zero, other instruments issued by government agencies or the private sector are supposed to carry some risk.

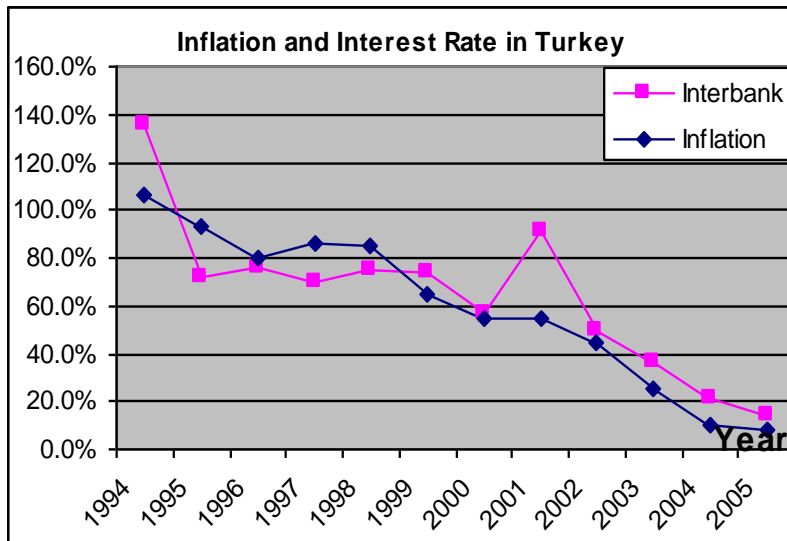
The following tables and graphs show inter-bank rates of interest and inflation for Turkey for the period 1994 through 2005, and, Fed Funds, Prime Rate and inflation rates for the USA for the period 1978 through 2005:

<b>Year</b>	<b>Inflation (%)</b>	<b>Fed Fund (%)</b>	<b>Prime Rate (%)</b>
1978	7.59	7.94	9.06
1979	11.35	11.20	12.67
1980	13.50	13.35	15.26
1981	10.32	16.39	18.87
1982	6.16	12.24	14.85
1983	3.21	9.09	10.79
1984	4.32	10.23	12.04
1985	3.56	8.10	9.93
1986	1.86	6.80	8.33
1987	3.65	6.66	8.21
1988	4.14	7.57	9.32
1989	4.82	9.21	10.87
1990	5.40	8.10	10.01
1991	4.21	5.69	8.46
1992	3.01	3.52	6.25
1993	2.99	3.02	6.00
1994	2.56	4.21	7.15

Year	Inflation (%)	Fed Fund (%)	Prime Rate (%)
1995	2.83	5.53	8.83
1996	2.95	5.30	8.27
1997	2.29	5.46	8.44
1998	1.56	5.35	8.35
1999	2.21	4.97	8.00
2000	3.36	6.24	9.23
2001	2.85	3.88	6.91
2002	1.58	1.67	4.67
2003	2.28	1.13	4.12
2004	2.66	1.35	4.34
2005	3.30	3.22	6.19

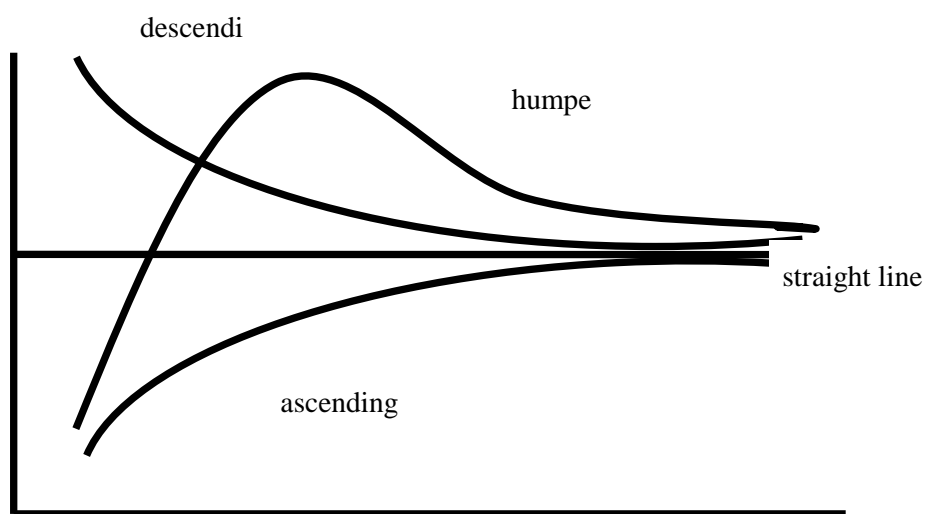


Inflation and Interest Rate in Turkey		
Year	Inflation	Interbank
1994	106.0%	136.0%
1995	93.6%	72.3%
1996	80.0%	76.2%
1997	85.7%	70.3%
1998	84.6%	74.5%
1999	64.9%	73.5%
2000	54.9%	56.7%
2001	54.4%	91.5%
2002	45.0%	49.5%
2003	25.3%	36.1%
2004	10.6%	21.0%
2005	7.7%	14.0%



## 2- Term Structure of Interest Rate (Yield Curve)

The relationship among the yields of high grade securities that differ only in their term to maturity is called “Term Structure of Interest Rate” or “Yield Curve”. If we look at the market at any given moment of time and draw a line connecting the yields for various maturities of the same type of risk, we obtain a yield curve. The curve may be humped, ascending or descending (actually, it became a straight line for the Swiss franc in the 1960s; to-day, this is the case only for the Iranian Rial).



Let us consider some of the theories proposed to explain the shape of the yield curve:

### - Expectation Theory

According to the Expectation Theory, the term structure of interest rate is based on the current expectation of future short term rates. Thus, the yield on a 5-year instrument is equal to the geometric mean of the

actual yield of a 1-year instrument to-day and the expected yield of 1-year instruments for the next 5 years, as shown in the formula below:

$${}_0r_5 = \sqrt[5]{(1+{}_0r_1)(1+{}_1r_1)(1+{}_2r_1)(1+{}_3r_1)(1+{}_4r_1)} - 1$$

In the above formula,  ${}_0r_5$  is the yield of a 5-year instrument in time 0,  ${}_0r_1$  is the actual yield of a 1-year instrument in time 0,  ${}_1r_1$  is the expected yield of a 1-year instrument in the beginning of the 2<sup>nd</sup> year and so forth. Obviously, it can be shown in the following formula as well:

$${}_0r_5 = \sqrt{(1+{}_0r_1)(1+{}_4r_1)} - 1$$

which denotes that the yield on a 5-year instrument to-day is equal to the geometric mean of the actual yield of a 1-year instrument to-day and the expected yield of a 4-year instrument in the beginning of the 2<sup>nd</sup> year. Of course, the expected yield of a 4-year instrument a year from now is equal to:

$${}_1r_4 = \sqrt[4]{(1+{}_1r_1)(1+{}_2r_1)(1+{}_3r_1)(1+{}_4r_1)} - 1$$

### - Liquidity Preference Theory

One of the difficulties of the Expectation Theory is the assumption of perfect certainty about future rates. In the real world, the future is uncertain and our expectations never coincide with the reality. Consequently, short-term instruments are generally preferred to longer-term instruments and even if expected future rate are the same as present rates, an additional sum is needed to encourage the investor to freeze his capital (or *invest*) for a longer period. That is why the yield curve must be

ascending under normal circumstances. In the following formula  $L$  denotes the element of risk:

$${}_0r_5 = \sqrt{(1+{}_0r_1)(1+{}_1r_4+L)} - 1$$

### **-Segmented Market Theory**

According to this theory, mainly attributed to J.M. Culbertson, money market and capital market are distinctly separate and the institutions active in one market do not operate in the other market. As a result, two different sets of demand and supply determine the rates of interest and there is no justification for drawing a curve to connect the yields of various maturities and thereby obtain the *yield curve*. As there exist today novel instruments, such as FRN (floating rate note) and floating rate bonds, linking the two markets, this theory is no longer defensible.

## **3-The Iranian Experience**

### **A-Money Market & Capital Market**

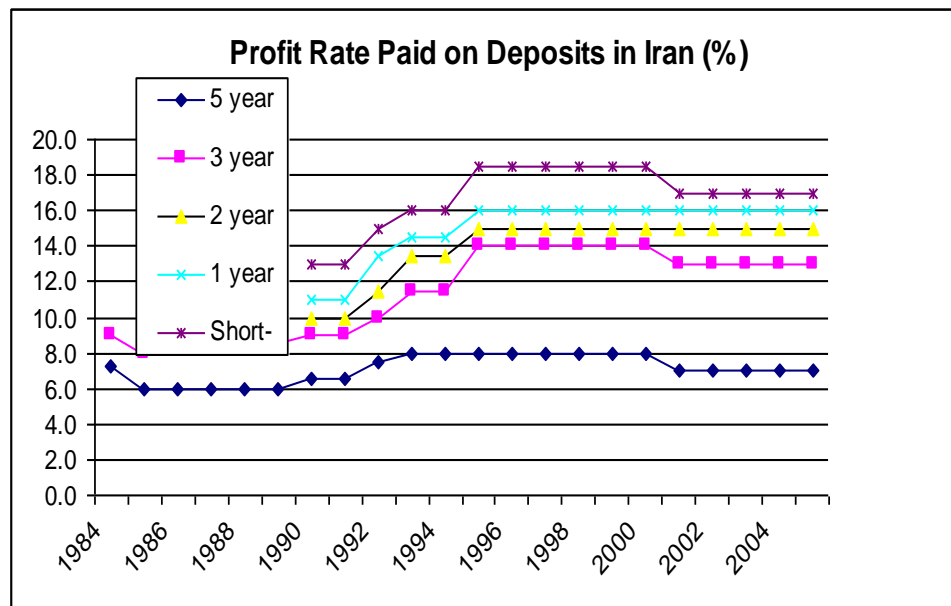
In order to define these markets properly, it is important to determine the nature of their operations and the instruments employed in each market. As we shall see, many of the problems referred, arise out of failing to heed these basic considerations.

The money market is a short-term market in which instruments transacted have less than one-year maturity, such as treasury bills, bankers' acceptances, commercial papers etc. The main operators in the money market consist of commercial banks, other financial institutions and insurance companies (specialized in property and casualty). The capital market deals with long-term instruments which have beyond one-year maturity. Investment companies, life insurance companies, pension

fund and development banks operate in this market, and the instruments dealt with are government bonds, bonds issued by financial institutions and industrial companies, long term loans, as well as stocks and shares.

<b>Profit Rate Paid on Deposits in Iran (%)</b>					
<b>year</b>	<b>Short-term</b>	<b>1-year</b>	<b>2-year</b>	<b>3-year</b>	<b>5-year</b>
1984	7.2	9.0			
1985	6.0	8.0			
1986	6.0	8.5			
1987	6.0	8.5			
1988	6.0	8.5			
1989	6.0	8.5			
1990	6.5	9.0	10.0	11.0	13.0
1991	6.5	9.0	10.0	11.0	13.0
1992	7.5	10.0	11.5	13.5	15.0
1993	8.0	11.5	13.5	14.5	16.0
1994	8.0	11.5	13.5	14.5	16.0
1995	8.0	14.0	15.0	16.0	18.5
1996	8.0	14.0	15.0	16.0	18.5
1997	8.0	14.0	15.0	16.0	18.5
1998	8.0	14.0	15.0	16.0	18.5
1999	8.0	14.0	15.0	16.0	18.5
2000	8.0	14.0	15.0	16.0	18.5
2001	7.0	13.0	15.0	16.0	17.0
2002	7.0	13.0	15.0	16.0	17.0
2003	7.0	13.0	15.0	16.0	17.0
2004	7.0	13.0	15.0	16.0	17.0
2005	7.0	13.0	15.0	16.0	17.0





## B- The Central Bank and the Re-discount Policy

As a matter of principle, the central bank's main function is to preserve the value of the currency, basically through manipulation of its re-discount rate. This is the rate of interest at which it stands ready to provide the banks with funds, either by 're-discounting' their first class short term papers, or by lending to them on the security of such assets. The central bank's action generally should not go any further, and, it is not supposed to intervene directly in the money market.

The effects of changing the re-discount rate, however, directly influences the money market and may somewhat spread throughout the structure of interest rates. It is clear that the longer the end of the market for funds, i.e., the capital market, the less will be affected by changes in the rediscount rate, if at all. The rates of interest for various maturities and risks, in the money market, as well as the capital market, are, therefore, essentially determined by demand and supply, plus the weight of forces applied by the central bank's re-discount rate and other monetary

policy instruments (such as statutory deposits) affecting the supply of funds.

### **C-In Iran**

The capital market in Iran is ‘organized’ around the stock exchanges, where the only instrument traded is companies’ shares. Up until recently, there has been no designated authority to supervise this market and the Central Bank had considered it fit to fill in the gap by supervising both the money and capital markets.

Unfortunately, market forces have had little role to play in the determination of the rates, either before or after the revolution. At least, before the revolution, the Central Bank was mostly concerned with the monetary policy and supervision of banks, while the government provided relatively cheap long-term funds to the specialized (development) banks, to promote investment, thereby influencing the long term rates and the capital market. After the revolution, at first the banking system was nationalized and then, when the banks were required to implement the provisions of the “Usury-Free Banking” Act, the use of ‘participatory contracts’ became almost universal. As a result, in effect all banks, whether specialized or commercial, entered the capital market and granted long-term facilities and entered into joint investment projects, for which they needed to procure long-term resources.

### **D-Determined Rates**

In 1369 (1990), in order to mop up excess liquidity (and contain mushrooming ‘joint investment’ companies) and also as the official body responsible for supervising the banking system, the Central Bank authorized the commercial banks to receive deposits of up to 5 years and determined its rate. This decision was, apparently, based on a rather crude appreciation of the liquidity preference theory, without thinking about the long-term

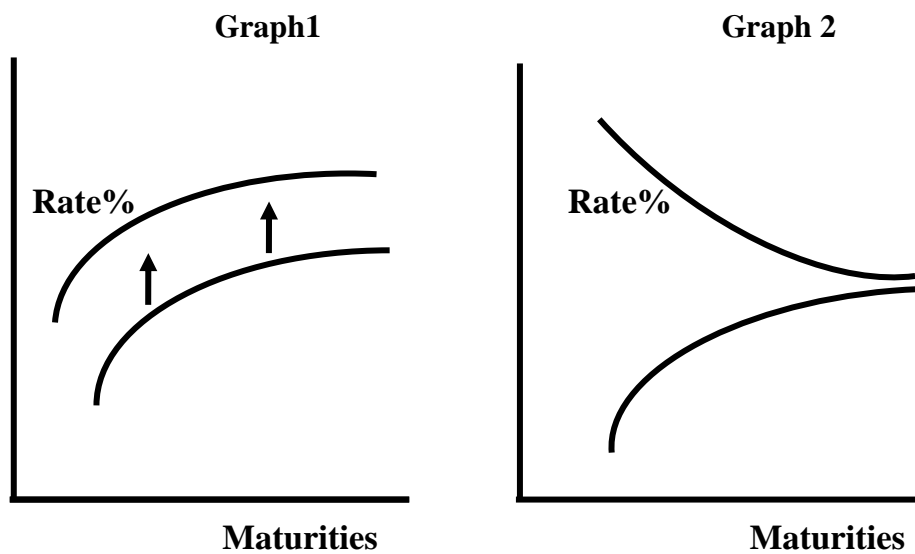
consequences. Consequently, the yield curve shifted upwards, as implied in the new classical definition of the rate of interest,

$$i_n = i_r + I + \delta$$

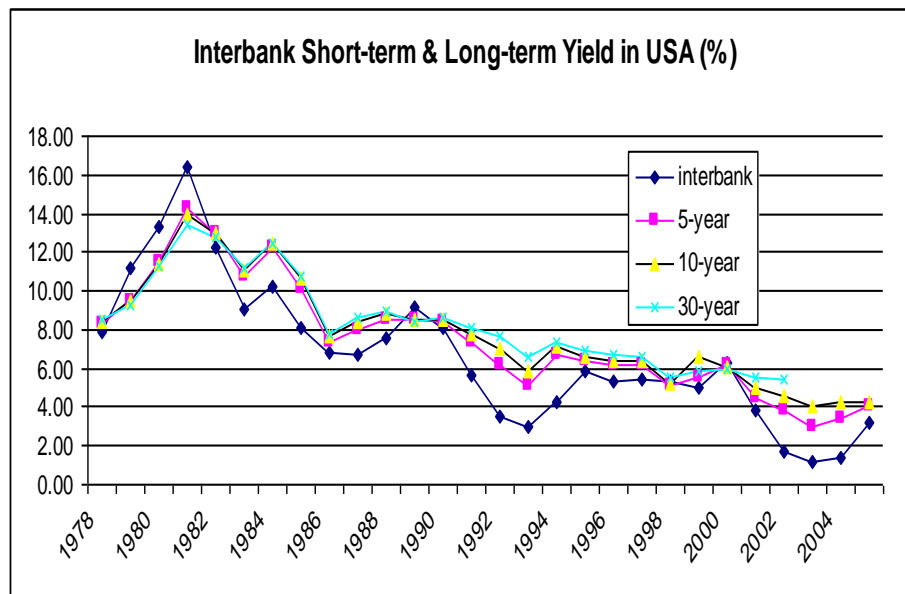
and, in a sense, inflation was institutionalized.

In fact, had the Central Bank intervened exclusively through the shorter end of the money market (re-discounting) and enforced its contractionary monetary policy, the yield curve would have adopted a descending posture and the long-term rates would have fallen below short-term rates. In that case, graph 2 would have replaced graph 1 below.

In this connection, it is interesting to contemplate on what happened in the US between 1979 and 1981, and subsequently the positive result obtained, as shown in the following table and chart:



<b>Interbank and Short-term &amp; Long-term Yield in USA (%)</b>				
<b>Year</b>	<b>interbank</b>	<b>5-year</b>	<b>10-year</b>	<b>30-year</b>
1978	7.90	8.32	8.41	8.49
1979	11.20	9.51	9.43	9.28
1980	13.35	11.45	11.43	11.27
1981	16.39	14.25	13.92	13.45
1982	12.24	13.01	13.01	12.76
1983	9.09	10.79	11.10	11.18
1984	10.23	12.26	12.46	12.41
1985	8.10	10.12	10.62	10.79
1986	6.80	7.30	7.67	7.78
1987	6.66	7.94	8.39	8.59
1988	7.57	8.48	8.85	8.96
1989	9.21	8.50	8.49	8.45
1990	8.10	8.37	8.55	8.61
1991	5.69	7.37	7.78	8.14
1992	3.52	6.19	7.01	7.67
1993	3.02	5.14	5.87	6.59
1994	4.21	6.69	7.09	7.37
1995	5.83	6.38	6.57	6.88
1996	5.30	6.18	6.44	6.71
1997	5.46	6.22	6.35	6.61
1998	5.36	5.15	5.26	5.58
1999	4.97	5.55	6.63	5.87
2000	6.24	6.16	6.03	5.94
2001	3.88	4.46	5.02	5.49
2002	1.67	3.82	4.61	5.43
2003	1.13	2.97	4.01	
2004	1.35	3.43	4.27	
2005	3.22	4.05	4.29	



## 4-The Policy of Deposit-Taking by Banks

### A-Commercial Banks

Commercial banks should only operate in the money market. On the facilities side, these banks are supposed to provide working capital and current assets financing for the firms, and on the liabilities side, their deposits should consist of current accounts, interbank accounts, savings accounts and certificates of deposits of up to one-year maturity.

Two innovations have encouraged the commercial banks to show interest in extending long-term facilities: I-introduction of floating rates, and II-securitization, or the possibility of converting bank portfolio into tradable instruments, which offers the possibility of getting out of long-term commitments. Notwithstanding the possibility of getting into long-term commitments (given the coverage provided), commercial banks rarely take more than 1-year deposits.

## **B- Development Banks**

Due to non-existence of an organized capital market, and in order to provide long-term capital to foster economic growth (& employment), less-developed and developing nations have been encouraged to set up development banks and many of them have done so. These banks are generally active in providing long-term funds (usually in the form of loans) to complement funds provided by the investors themselves. Naturally, these banks need long term resources, which are catered for by: I-the government through the development budget (or, as in the case of Iran, the Oil Reserve Fund), II-semi-governmental or multinational institutions, or regional banks, such as the Asian Development Bank, the World Bank or the Islamic Development Bank, III-syndicated bank loans or bond issues in foreign capital markets, IV-Rial sources, such as certificates of deposit and v-participation bonds in the domestic market.

## **C-The Iranian Banks**

Considering the mixed activities of commercial banking and development banking undertaken by the Iranian banks on the one hand, and, usury-free banking with participatory contracts, on the other, the banking system in Iran has been forced to entertain short, as well as medium and long-term deposits.

## **New Model for Interest-Free Banking**

The Usury-free Banking Act of 1362 (1983) had several defects, which included:

-Too many types of banking contracts were embedded in the Act. This made their application and training of the personnel costly and cumbersome.

- Difficulty of training the personnel for fully understanding all the contracts, made it difficult for the client to choose the most appropriate one.
- As a direct consequence of the above, the notional nature of most contracts.
- Some contracts have no application in banking and can not be correctly implemented.
- Some contracts need effective supervision for which commercial banks are not equipped.
- Correct implementation of some contracts is too costly and uneconomical for banks.
- Some contracts do not correspond with the objectives or taste of the bank clients (depositors or borrowers), as a result they are not interested in the correct implementation of the contract.
- Several university professors, theologians and bank directors have studied the Usury-Free Banking Act of 1362 of Iran and have compared it with the practice in other Moslem countries. They have prepared a new model under the existing law, the salient features of which are presented below:
  - Two categories of contracts have been defined in this model: 'participatory' (mosharekati) and 'transactional' (mobadele'i) contracts.
  - Three types of banks have been defined: commercial banks, specialized banks and universal (all purpose) banks.
  - Commercial banks may use five types of transactional contracts: sale by installment, hire purchase, Ja'aleh (fee for service), purchase of obligation and forward transaction. For these, the rates received by

banks on their facilities and paid to their deposits are predetermined for any period.

- Specialized banks may also make use of 'participatory' contracts, such as civil participation and *mozarebeh* (joint) contracts.
- Universal banks could make use of all contracts and accept all kinds of deposits. The basic precondition for operating a universal bank is an advanced accounting system capable of matching sources and uses of funds with variable rates.
- A distinctive advantage of this model, is the extensive use of purchase of obligation, which enables a bank to extend lines of credit (or, credit in current account), not permissible under the existing format. It also makes it possible for the Central Bank to re-discount and thereby perform one of the basic functions of a central bank.

### **Summary and Conclusion:**

- The nominal rate of interest is a function of inflation.
- For an efficient implementation of the monetary policy, the Central Bank not only needs to be independent; its intervention must also exclusively take place through the money market, by determining the rate at which it stands ready to provide short term funds to banks (the rediscount rate), when they need them.
- It is much preferred that market forces determine the rate of 'interest' (profit) rather than administrative orders.
- If these proposals are accepted, the Central Bank will be able to control inflation within a few years, as was the case in Turkey.
- Commercial banks, should not accept more than 1-year deposits.
- Commercial banks activities should be confined to 'participatory' contracts and they should avoid long-term commitments such as participation.



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