

Investment Plan for İlkay's Child Education

İlkay Yaşam at age of 32 has been working for a worldwide company as an engineer with current net salary 10,000 TL. She decided to make an investment for her child's education for a **10-year time frame**. In the last 8 years, she has saved a small fortune as an amount of 50,000 TL. She is little confused about type of the investment that she will make. There are two ways to invest her savings for her child's education. First way is to deposit money for Individual Pension System (IPS). IPS is a system that enables people to earn an income that can maintain their living standards in retirement periods by directing the savings they make during their active working lives to long-term investment. However, although IPS is designed for retirement (**more than 10** years), İlkay is planning to use the system as **10-year time frame as a saving tool**. Second way to save money for her child's education is to create deposit account in a bank for **10-year time frame**. Hence, she asked a friend (who took Engineering Economy) for a help that her financial plans **by developing the monthly financial plan (cash flows) with taking into account the time value of the money**.

Bank Deposit:

- Saving amount of 50,000TL will be deposited in a bank for 10-year period. Estimated MARR values for each year compounded monthly, are given in below table. **Note that, the income tax in this type of deposit accounts is 15% for the returns (see below *)**.

Year	1	2	3	4	5	6	7	8	9	10
Estimated MARR (%)	10	11	9	9	8.5	10	9.5	11.5	9	8.5

IPS System:

- Her current salary is 10,000 TL. She will save 1,000TL for each month for the first year. For the following years, she will get salary **increases**. Her net savings will also be increased as salary increases in same percentages. The 10 year estimated salary increase percentages are given as in below table.

Year	2	3	4	5	6	7	8	9	10
Increase (%)	3.5	4	3.8	4.1	2.9	3.4	4.3	2.8	3.7

- In IPS, she is able to deposit **any** additional amount **at any time**. This amount will be withdrawn from **bank deposit**. Remaining amount will still be **kept in the bank deposit**. However, she is planning to deposit **these extra amount payments** anytime between 6th and 10th years. She wants to see from her friend to present **at least four different alternative plans** that show in which month additional deposit should be made to get maximum accumulated amount at the end of year 10.
- If she chooses IPS, the government provides %25 support in entire accumulated amount at the end. **Note that, the annual total government support could not be more than 7,500 TL**. But, İlkay will be able to get %60 percent of the government support if she quits the system at the end of year 10.

- Estimated **annual returns on the pension deposits** compounded monthly are given below to calculate the accumulated **total amount in IPS**.

Year	1	2	3	4	5	6	7	8	9	10
Rate of Return (%)	11	10	8.5	9	10	9.8	10.2	12.3	12	11.8

Also, there will be an income tax of 10% for IPS returns to be calculated at the end of year 10 (see below **).

In the lights of information supplied above, she wonders that: **How reasonable are her goals? What will be the accumulated amount for the investment plan at the end of 10-year period?**

Note that you are supposed to perform analyzing your alternatives with at least using present worth and rate of return methods on Microsoft Excel.

Notes:

Income tax for bank deposits is to be deductible at the end of each compounding period:

$$* \quad \text{After Tax Effective Interest Rate} = \text{Effective Interest Rate} * (1 - \text{Tax Rate} (\%15))$$

Income tax in IPS is to be deductible at the end of 10 years period:

$$** \quad \text{Net Income After Tax} = \text{Total Amount of Money Accumulated in IPS} - (\text{Total Amount of Money Accumulated in IPS} - \text{Total Amount of Deposits for IPS}) * (\text{Tax Rate} (\%10))$$