Part 2

Investing in a property after taking a loan from the bank

One of the most critical financial decisions one must make while buying a house , whether to take a loan or not ? This report serves as a guide for both my future self and anyone else facing a similar dilemma . So we are doing a course CE657 - “Construction Economics & Infrastructure Financing ” in which we have taught economic decision making methods to comment on these problems such as Net present value , Internal rate of return (IRR) , Incremental Rate of return (IRoR) , etc . so we will use the method of net present value for this problem .

I have considered suitable economic decision- making parameters and made a few assumptions while creating the financial model. I have used real-world numbers pertaining to the city of Mumbai while doing this analysis, but I have permitted any changes in the Parameters (sensitivity analysis) one would like to make specific to his/her requirements .

Assumptions :

1. *Assuming purchase price is 2 cr .*
2. *Assuming a down payment of 25% .*
3. *Assuming land appreciation rate of 6%*
4. *Assuming a loan interest rate of 8%.*
5. *Assuming discount rate of 10% .*
6. *All calculations done for a period of 10 yrs .*
7. *Assuming property tax to be constant and is calculated w.r.t initial price of land .*

Formulas Required :

1. *Single Payment Compound amount factor : (F/P,i,n)*
2. *Single Payment Present worth factor : (P/F,i,n)*
3. *Uniform Series Present worth factor : (P/A,i,n)*
4. *Uniform Series Capital recovery factor : (A/P,i,n) – also known as PMT factor which is used in calculations for EMI .*

Calculations :

- **Down Payment Amount (Rs):** 5,000,000 (25% of the purchase price)
- **Loan Amount (Rs):** 15,000,000 (Purchase Price - Down Payment)
- **EMI (Monthly):** Calculated using the PMT formula - =PMT(6/(12*100),10*12,15000000) which is coming to be Rs 1,81,991.39
- **EMI (Yearly):** Monthly EMI multiplied by 12 = Rs 21,83,896.70
- **Annual Property Tax (Rs):** 200,000 (1% of the purchase price)
- **Property Appreciation Value after 10 Years (Rs):**: 20000000 * (1.1)^10 = Rs 3,58,16,953.93
- **Present Value of Broker Selling Cost:** (P/F, i, n) = Rs 1,38,089.86
- **Present Value of Annual Property Tax:** (P/A, i, n) = PV(10/100,10,200000) = -12,28,913
- **Present Value of EMI:** (P/A, i, n) — PV(10/100,10,2183896.70) = -1,34,19,099.82
- **Present Value of Down Payment:** -50,00,000 Rs
- **Present Value of Appreciated Home after 10 Years:** (P/F, i, n) = 3,58,16,953.93 *((1+10/100)^-10) = 1,38,08,986

Net present Value :

- **NPV =** 1,38,08,986 - -50,00,000 - 1,38,089.8624 - 12,28,913 - 1,34,19,099.82 = -59,77,116.863

Results :

Based on the calculations:

- **Decision:** If NPV > 0, the investment is financially viable. If NPV < 0, the investment is not recommended.
- In our case it is not viable to invest in property by taking out a loan since our NPV is calculated to be negative (-59,77,116.863) .