

In finance, the net present value (NPV) of a time series of cash flows, both incoming and outgoing, is defined as the sum of the present values (PVs) of the individual cash flows of the same entity.

In the case when all future cash flows are incoming (such as coupons and principal of a bond) and the only outflow of cash is the purchase price, the NPV is simply the PV of future cash flows minus the purchase price (which is its own PV). NPV is a central tool in discounted cash flow (DCF) analysis and is a standard method for using the time value of money to appraise long-term projects. Used for capital budgeting and widely used throughout economics, finance, and accounting, it measures the excess or shortfall of cash flows, in present value terms, above the cost of funds.

NPV can be described as the “difference amount” between the sums of discounted: cash inflows and cash outflows. It compares the present value of money today to the present value of money in the future, taking inflation and returns into account.

$$\text{Cash flow (R)} = \text{Income} + \text{Additional benefit} - \text{Fixed Cost} - \text{Variable cost}$$

$$i = 5\% \quad \text{NPV} = \text{sum of discounted cash flows}$$

Year (t)	Fixed cost	Variable cost	Income	Additional benefit	Cash flows	Discounted Cash Flows
0	1200000				-1200000	-1200000
1	100000	180000	150000	200000	70000	66666,6667
2	100000	183600	156000	200000	72400	65668,9342
3	100000	187272	162240	200000	74968	64760,1771
4	100000	191017,44	168729,6	200000	77712,16	63933,9864
5	100000	194837,789	175478,8	200000	80641	63184,3298
6	100000	198734,545	182497,9	200000	83763,39	62505,5319
7	100000	202709,235	189797,9	200000	87088,62	61892,2544
8	100000	206763,42	197389,8	200000	90626,35	61339,4787
9	100000	210898,689	205285,4	200000	94386,67	60842,4884
10	100000	215116,662	213496,8	200000	98380,11	60396,8531
11	100000	219418,996	222036,6	200000	102617,6	59998,413
12	100000	223807,376	230918,1	200000	107110,7	59643,264
13	100000	228283,523	240154,8	200000	111871,3	59327,7441
14	100000	232849,193	249761	200000	116911,8	59048,42
15	800000	237506,177	259751,5	200000	-577754,7	-277909,89
16	100000	242256,301	270141,5	200000	127885,2	58585,695
17	100000	247101,427	280947,2	200000	133845,8	58396,4617
18	100000	252043,455	292185,1	200000	140141,6	58231,7373
19	100000	257084,325	303872,5	200000	146788,2	58089,0565
20	100000	262226,011	316027,4	200000	153801,4	57966,117
21	100000	267470,531	328668,5	200000	161197,9	57860,7698
22	100000	272819,942	341815,2	200000	168995,3	57771,0107
23	100000	278276,341	355487,8	200000	177211,5	57694,9723
24	100000	283841,868	369707,3	200000	185865,5	57630,916
25	100000	289518,705	384495,6	500000	494976,9	146168,056

$$\text{NPV}(i, N) = \sum_{t=0}^N \frac{R_t}{(1+i)^t}$$

$$\text{NPV} = 59693,44$$

So, the answer is A.