

# [Salvage value for the machine engineering essay](https://assignbuster.com/salvage-value-for-the-machine-engineering-essay/)

[Engineering](https://assignbuster.com/essay-subjects/engineering/)

SET A

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## Solution 1:

Machine cost = 700, 000+ 80, 000+20, 000 = 800, 000

## Calculations for depreciation both Machines:

## Items

## Yr 1

## Yr 2

## Yr 3

## Yr 4

Old MachineBook Value ( beginning of Yr)80000600004000020000Depreciation20000200002000020000Book Value ( end of Yr)6000040000200000New MachineBook Value ( beginning of Yr)800000560000392000274400Depreciation24000016800011760082320Book Value ( end of Yr)560000392000274400192080

Incremental Depreciation2200001480009760062320Total capital expenditure in first year = 696, 000Salvage value for the machine = 50000 + (192080-50000)\*(0. 4) = 106832

## Cash flow table

## Items

## Yr 0

## Yr 1

## Yr 2

## Yr 3

## Yr 4

Operating Expenses

290000290000290000290000Operating Incomes

290000290000290000290000Less Depreciation

2200001480009760062320EBIT

70000142000192400227680Subtract Tax (@40%)

28000568007696091072Net Income

4200085200115440136608Add Back Depreciation

2200001480009760062320Subtract Replacement Cost696, 000

Add Tax Adjusted Salvage Of New Machine

106832Cash Flows-696, 000262, 000233, 200213, 040305, 760

## Calculations for Internal Rate of Return:

Average Cash Flow per Year: (262000+233200+213200+213040+305760)/4 = 253500Estimate of payback period: 696000/253500 = 2. 7456From present factor annuity tables, 2. 7456 for a period of 4 years corresponds to a rate of 18%NPV (@18%) = -696, 000 + 262, 000\*0. 847 + 233, 200\*0. 718 + 213, 040\*0. 609 + 305, 760\*0. 516 = -19135NPV (@17%) = -696, 000 + 262, 000\*0. 855 + 233, 200\*0. 731 + 213, 040\*0. 624 + 305, 760\*0. 534 = -5308NPV (16%) = -696, 000 + 262, 000\*0. 862 + 233, 200\*0. 743 + 213, 040\*0. 641 + 305, 760\*0. 552 = 8450IRR = 16 + {(17-16)/ (-5308-8450)}\*(0-8450) = 16. 61%The IRR is approximately equal to 16. 61%At 10% rate: Thus NPV = -696, 000 + 262, 000\*0. 9091 + 233, 200\*0. 8264 + 213, 040\*0. 7513 + 305, 760\*0. 6830 = 103792Company can replace old m/c with the new as NPV > 0 & IRR > hurdle rateSolution 2: New machine cost: 475000+5000 = 480, 000

## Depreciation :

## Items

## Yr 1

## Yr 2

## Yr 3

## Yr 4

New MachineBook Value ( beginning of Yr)480000336000235200164640Depreciation1440001008007056049392Book Value ( end of Yr)336000235200164640115248Replacement Cost: 480, 000-100, 000 = 380, 000Salvage Value for New Machine : 115248- (120000-115248)\*(0. 34) = 113632

## Annual Net Incremental Cash Flows:

## Items

## Yr 0

## Yr 1

## Yr 2

## Yr 3

## Yr 4

Total Savings

110000110000110000110000Operating Income

110000110000110000110000Less Depreciation

1440001008007056049392EBIT

-3400092003944060608Less Tax (@34%)

-11560312813409. 620606. 72Net Income

-22440607226030. 440001. 28Add Back Depreciation

1440001008007056049392Less Replacement Cost380, 000

Add Tax Adjusted Salvage Of New Machine

113632Cash Flows-380, 000121, 560106, 87296, 590203, 025

## Calculations for Internal Rate of Return:

Average Cash Flow: (121, 560 + 106, 872 + 96, 590 + 203, 025)/4 = 132012payback period: 380000/132012 = 2. 87852. 8785 for a period of 4 years = 14%NPV (@14%) =-380, 000 + 121, 560\*0. 877 + 106, 872\*0. 769 + 96, 590\*0. 675 + 203, 025\*0. 592= -5818NPV (@13%) = -380, 000 + 121, 560\*0. 885 + 106, 872\*0. 783 + 96, 590\*0. 693 + 203, 025\*0. 613 = 2653IRR = 13 + {(14-13)/ (-5818-2653)}\*(0-2653) = 13. 31%At 10% hurdle: NPV = -380, 000 + 121, 560\*0. 9091 + 106, 872\*0. 8264 + 96, 590\*0. 7513 + 203, 025\*0. 6830

## = 30063

IRR > hurdle rate and NPV > 0Thus Adam smith can automateSolution 3: New Machine cost: 25, 000 +2, 000 = 27, 000

## Calculations for depreciation new Machines::

## Items

## Yr 1

## Yr 2

## Yr 3

## Yr 4

## Yr 5

New MachineBook Value ( beginning of yr)2700016200972058323499Depreciation108006480388823331400Book Value ( end of Yr)162009720583234992100Replacement Cost: 27, 000-6, 000 = 21, 000Salvage Value: 5000 - (5000-2100)\*(0. 35) = 3985

## Annual Net Incremental Cash Flows:

## Items

## Yr 0

## Yr 1

## Yr 2

## Yr 3

## Yr 4

## Yr 5

Total Savings

75007500750075007500Technical Support Expense

750750750750750Operating Income

67506750675067506750Less Depreciation

108006480388823331400EBIT

-4050270286244175350Less Tax (@35%)

-141895100215461873Net Income

-2633176186028713478Add Back Depreciation

108006480388823331400Less Replacement Cost21000

Less Increase In WC1000

Add Release of WC

1000Add Tax Adjusted Salvage Of New Machine

3985Cash Flows-220008168665657485204886210% NPV = -22000 + 8168\*0. 9091 + 6656\*0. 8264 + 5748\*0. 7513 + 5204\*0. 6830 + 8862\*0. 621 = 4302

## Calculations for Internal Rate of Return:

Average Cash (8168 + 6656 + 5748 + 5204 + 8862)/5 = 6928payback period: 22000/6928 = 3. 17553. 1755 for a period of 5years = 17%NPV (@17%) =-22000 + 8168\*0. 855 + 6656\*0. 731 + 5748\*0. 624 + 5204\*0. 534 + 8862\*0. 456= 256NPV (@18%) =-22000 + 8168\*0. 847 + 6656\*0. 718 + 5748\*0. 609 + 5204\*0. 516 + 8862\*0. 437=-244IRR = 17 + {(18-17)/ (-244-256)}\*(0-256)= 17. 51%The IRR is approximately equal to 17. 51%IRR > hurdle rate and NPV > 0. It is adviced to buy new machineSolution 4:

## Calculations for depreciation Machines:

## Items

## Yr 1

## Yr 2

## Yr 3

## Yr 4

## Yr 5

## Yr 6

## Yr 7

New MachineBook Value ( beginning of yr)1500000975000633750411938267759174044113128Depreciation525000341250221813144178937166091539595Book Value (end of yr)97500063375041193826775917404411312873533Salvage Value of New Machine: 400, 000 - (400, 000-73, 533)\*(0. 4)= 269, 413

## Annual Net Incremental Cash Flows:

## Items

## Yr 0

## Yr 1

## Yr 2

## Yr 3

## Yr 4

## Yr 5

## Yr 6

## Yr 7

Sales

500000500000500000500000500000500000500000Cost of production

300000300000300000300000300000300000300000Operating Income

200000200000200000200000200000200000200000Less Depreciation

525000341250221813144178937166091539595EBIT

-325000-141250-2181355822106284139085160405Less Tax (@40%)

-130000-56500-872522329425145563464162Net Income

-195000-84750-1308833493637718345196243Add Back Depreciation

525000341250221813144178937166091539595Equipment Cost1500000

Salvage Of New Machine

269, 413Cash Flows-1500000330000256500208725177671157486144366405251NPV = -1, 500, 000 + 330, 000\*0. 9091 +256, 500\*0. 8264 + 208, 725\*0. 7513 + 177, 671\*0. 6830 + 157, 486\*0. 621 + 144, 366\*0. 564 + 405, 251\*0. 513= -322, 746

## Internal Rate of Return:

Average Cash Flow per Year: (330, 000 +256, 500 + 208, 725 + 177, 671 + 157, 486 + 144, 366 + 405, 251)/7 = 240, 000payback period: 1, 500, 000/240, 000 = 6. 256. 25 for a period of 7 years corresponds to a rate of 2%NPV (@2%) = -1, 500, 000 + 330, 000\*0. 980 +256, 500\*0. 961 + 208, 725\*0. 942 + 177, 671\*0. 924 + 157, 486\*0. 906 + 144, 366\*0. 888 + 405, 251\*0. 871= 54, 256NPV (@3%) = -1, 500, 000 + 330, 000\*0. 971 +256, 500\*0. 943 + 208, 725\*0. 915 + 177, 671\*0. 888 + 157, 486\*0. 863 + 144, 366\*0. 837 + 405, 251\*0. 813= -2721IRR = 2 + {(3-2)/ (-2721-54256)}\*(0-54265) = 2. 95%The IRR is approximately equal to 2. 9

## Thus we should not go ahead with the project as NPV is negative