

Excerpt from
***Introduction to Real Estate Finance and Investment:
Sample Problems, Student Edition, by Frank Gallinelli***

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Chapter 19: Internal Rate of Return

Think back to the discussion of Discounted Cash Flow. You had a series of future cash flows and a given discount rate. You used the rate to discount each of the cash flows back to the present, added up the results, and called that the Present Value of the future cash flows.

Later you took the process one step further with Net Present Value when you subtracted the initial investment from the Present Value of the future cash flows.

What both of these procedures had in common was that you “knew” the discount rate – or at least, you specified the rate to be used, and calculated the Present Value accordingly. With Internal Rate of Return, the discount rate becomes the unknown factor. What discount rate makes the Present Value of the future cash flows equal to what you paid for them, i.e., equal to the initial investment? To put it another way, what discount rate makes the Net Present Value equal to zero? That rate is the Internal Rate of Return.

Put away your pencil. Anyone who thinks it’s a good idea to compute IRR manually is so lacking in judgment that they should not be allowed to play with real money. You can compute IRR with Excel, or more simply, you can download an Excel model to do it for you. Go to our site <http://www.realdata.com/book>.

Problem 19-1:

What is the Internal Rate of Return for the property described in Problem 17-1?

Problem 19-2:

What is the Internal Rate of Return for the property described in Problem 17-2?

Problem 19-3:

In the scenario of Problem 17-2, suppose the legal fees at the time of the sale were increased by \$1,000, but the cash flows from years 1 and 2 were swapped. What would the Internal Rate of Return be then?

Answer 19-1:

Use the IRR Excel model and enter the data. Remember to include the sale proceeds as part of Year 4. Also note that the initial investment is a cash outflow and hence a negative number.

Initial Investment	(550,000)
Cash Flow, End of Year 1	90,003
Cash Flow, End of Year 2	91,803
Cash Flow, End of Year 3	93,639
Cash Flow, End of Year 4	1,789,512
Internal Rate of Return	44.33%

Answer 19-2:

Again, use the IRR Excel model and enter the data. Remember to include the sale proceeds as part of Year 3.

Initial Investment	(112,500)
Cash Flow, End of Year 1	13,431
Cash Flow, End of Year 2	17,931
Cash Flow, End of Year 3	217,855
Internal Rate of Return	33.15%

Answer 19-3:

Increasing the legal fees by \$1,000 (from \$6,000 to \$7,000) would reduce the sale proceeds by the same amount (from \$195,424 to \$194,424). So the total cash flow for Year 3 would be $\$22,431 + \$194,424 = \$216,855$. Now use the IRR Excel model and enter the data.

Initial Investment	(112,500)
Cash Flow, End of Year 1	17,931
Cash Flow, End of Year 2	13,431
Cash Flow, End of Year 3	216,855
Internal Rate of Return	33.33%

Thus, the Internal Rate of Return is slightly higher, because you receive the larger cash flow (\$17,931) a year sooner, which more than makes up for the \$1,000 reduction in sale proceeds.