MSCI 251: Lecture 5 extra

NPV simple method, step-by-step

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Net present value – simple formula

Building and running a gym

Year	*0*	*1*	*2*	*3*	*4*	*5*
Revenue		£120,000	£130,000	£140,000	£150,000	£160,000
Investment	£400,000					
Expenses		£50,000	£55,000	£50,000	£50,000	£70,000
Yearly cashflow						
Discount factor						
Discounted cashflow						
Net present value						

Investment is in Year 0, operations start in Year 1.
We can choose over many years we like to work out the NPV.
Here we have chosen 5 years.

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Net present value – simple formula

Building and running a gym

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Revenue		£120,000	£130,000	£140,000	£150,000	£160,000
Investment	£400,000					
Expenses		£50,000	£55,000	£50,000	£50,000	£70,000
Yearly cashflow	**-£400,000**	**£70,000**	**£75,000**	**£90,000**	**£100,000**	**£90,000**
Discount factor						
Discounted cashflow						
Net present value						

Deduct expenses from income to get a Yearly cashflow. Remember that in some years expenses may exceed income so result might be negative.

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Net present value – simple formula

Building and running a gym

Year	*0*	*1*	*2*	*3*	*4*	*5*
Revenue		£120,000	£130,000	£140,000	£150,000	£160,000
Investment	£400,000					
Expenses		£50,000	£55,000	£50,000	£50,000	£70,000
Yearly cashflow	**-£400,000**	**£70,000**	**£75,000**	**£90,000**	**£100,000**	**£90,000**
Discount factor						
Discounted cashflow						
Net present value						

Rate of return	10.0%
Inflation forecast	2.0%
Risk factor	5.0%
Discount rate	

Select the various components of the Discount rate.

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Net present value – simple formula

Building and running a gym

Year	*0*	*1*	*2*	*3*	*4*	*5*
Revenue		£120,000	£130,000	£140,000	£150,000	£160,000
Investment	£400,000					
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Yearly cashflow	**-£400,000**	**£70,000**	**£75,000**	**£90,000**	**£100,000**	**£90,000**
Discount factor						
Discounted cashflow						
Net present value						

Rate of return	10.0%
Inflation forecast	2.0%
Risk factor	5.0%
Discount rate	**17.0%**

Add them up.

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Net present value – simple formula

Building and running a gym

Year	*0*	*1*	*2*	*3*	*4*	*5*
Revenue		£120,000	£130,000	£140,000	£150,000	£160,000
Investment	£400,000					
Expenses		£50,000	£55,000	£50,000	£50,000	£70,000
Yearly cashflow	**-£400,000**	**£70,000**	**£75,000**	**£90,000**	**£100,000**	**£90,000**
Discount factor	1.000					
Discounted cashflow						
Net present value						

Discount factor in Year 0 is 1.000.

Rate of return	10.0%
Inflation forecast	2.0%
Risk factor	5.0%
Discount rate	**17.0%**

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Net present value – simple formula

Building and running a gym

Year	*0*	*1*	*2*	*3*	*4*	*5*
Revenue		£120,000	£130,000	£140,000	£150,000	£160,000
Investment	£400,000					
Expenses		£50,000	£55,000	£50,000	£50,000	£70,000
Yearly cashflow	**-£400,000**	**£70,000**	**£75,000**	**£90,000**	**£100,000**	**£90,000**
Discount factor	1.000	0.830				
Discounted cashflow						
Net present value						

Rate of return	10.0%
Inflation forecast	2.0%
Risk factor	5.0%
Discount rate	**17.0%**

Year 1 DF = Year 0 DF * (1-DR)
Year 1 DF = 1.000 * (1-0.17)

Use formula to work out Discount factor for Year 1. Working to 3 decimal places is sufficient.

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Net present value – simple formula

Building and running a gym

Year	*0*	*1*	*2*	*3*	*4*	*5*
Revenue		£120,000	£130,000	£140,000	£150,000	£160,000
Investment	£400,000					
Expenses		£50,000	£55,000	£50,000	£50,000	£70,000
Yearly cashflow	**-£400,000**	**£70,000**	**£75,000**	**£90,000**	**£100,000**	**£90,000**
Discount factor	1.000	0.830	0.689			
Discounted cashflow						
Net present value						

Rate of return	10.0%
Inflation forecast	2.0%
Risk factor	5.0%
Discount rate	**17.0%**

And for each year in turn…

Year 2 DF = Year 1 DF * (1-DR)

Year 2 DF = 0.830 * (1 – 0.17)

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Net present value – simple formula

Building and running a gym

Year	*0*	*1*	*2*	*3*	*4*	*5*
Revenue		£120,000	£130,000	£140,000	£150,000	£160,000
Investment	£400,000					
Expenses		£50,000	£55,000	£50,000	£50,000	£70,000
Yearly cashflow	**-£400,000**	**£70,000**	**£75,000**	**£90,000**	**£100,000**	**£90,000**
Discount factor	1.000	0.830	0.689	0.572	0.475	0.394
Discounted cashflow						
Net present value						

Rate of return	10.0%
Inflation forecast	2.0%
Risk factor	5.0%
Discount rate	**17.0%**

… to the end of the analysis period.

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Net present value – simple formula

Building and running a gym

Year	*0*	*1*	*2*	*3*	*4*	*5*
Revenue		£120,000	£130,000	£140,000	£150,000	£160,000
Investment	£400,000					
Expenses		£50,000	£55,000	£50,000	£50,000	£70,000
Yearly cashflow	**-£400,000**	**£70,000**	**£75,000**	**£90,000**	**£100,000**	**£90,000**
Discount factor	1.000	0.830	0.689	0.572	0.475	0.394
Discounted cashflow	**-£400,000**	**£58,100**	**£51,668**	**£51,461**	**£47,458**	**£35,451**
Net present value						

Multiply Yearly cashflow by Discount factor in each year.

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Net present value – simple formula

Building and running a gym

Year	*0*	*1*	*2*	*3*	*4*	*5*
Revenue		£120,000	£130,000	£140,000	£150,000	£160,000
Investment	£400,000					
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Yearly cashflow	**-£400,000**	**£70,000**	**£75,000**	**£90,000**	**£100,000**	**£90,000**
Discount factor	1.000	0.830	0.689	0.572	0.475	0.394
Discounted cashflow	**-£400,000**	**£58,100**	**£51,668**	**£51,461**	**£47,458**	**£35,451**
Net present value	**-£155,862**					

Add up all the Discounted cashflows to get the Net present value.

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Net present value – simple formula

Building and running a gym

Year	*0*	*1*	*2*	*3*	*4*	*5*
Revenue		£120,000	£130,000	£140,000	£150,000	£160,000
Investment	£400,000					
Expenses		£50,000	£55,000	£50,000	£50,000	£70,000
Yearly cashflow	**-£400,000**	**£70,000**	**£75,000**	**£90,000**	**£100,000**	**£90,000**
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Discounted cashflow	**-£400,000**	**£58,100**	**£51,668**	**£51,461**	**£47,458**	**£35,451**
Net present value	**-£155,862**					

Rate of return	10.0%
Inflation forecast	2.0%
Risk factor	5.0%
Discount rate	**17.0%**

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