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## What do those figures mean?

*Understanding financial appraisal*

*Paul Flowers, M3*

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## What has all this got to do with me?

You are looking at stock investment, then your finance department says:

- What's the **Payback?**
- What's the **NPV surplus?**
- When does this **breakeven?**

*What does it all mean?*

## Outline of presentation



- 1 Overview of financial appraisal
  - Cash flow, forecasting and predictions
- 2 Appraising maintenance options
  - Explanation of KPIs and common financial terms (NPV, NPV Surplus, Payback etc)
  - The Feed-In-Tariff
- 3 Why financial assumptions matter
  - Is there any room to manoeuvre?

## What this presentation does not cover



- Other, non-financial aspects of investment decisions
  - E.g. Strategic questions, tenant satisfaction
- Calculation of costs of works
- Estimation of life of components
  - i.e. Deciding a kitchen lasts 20 years

## Classic option appraisal question



- When maintaining a unit, what is the financial impact to your organisation of:
  - A. Doing the bare legal minimum each year?
  - B. Carrying out some planned maintenance?
  - C. Heavily investing now, to get lower costs in the future?

Only a financial appraisal can show the financial impact

## Financial appraisal— simple versus complicated



- Simple
  - Just add up the maintenance costs
    - Responsive cost this year £500, cost over 10 years = £5000, plus £1000 in year 5
- Complicated
  - NPV, NPV Surplus, Payback etc
    - Is borrowing involved?
    - Are you looking at maintenance in relation to rents/voids?
    - Is it a FIT income calculation?

## Financial appraisal - cost versus cash flow



- Which is cheapest (or best)?
- Can we afford it at all?
- When can we afford it?

Cost – buy 10,000 bathrooms now

Cash flow – you haven't got the money in the bank

Appraisal – what if you borrow the money?

## Thinking of borrowing money to invest in stock?

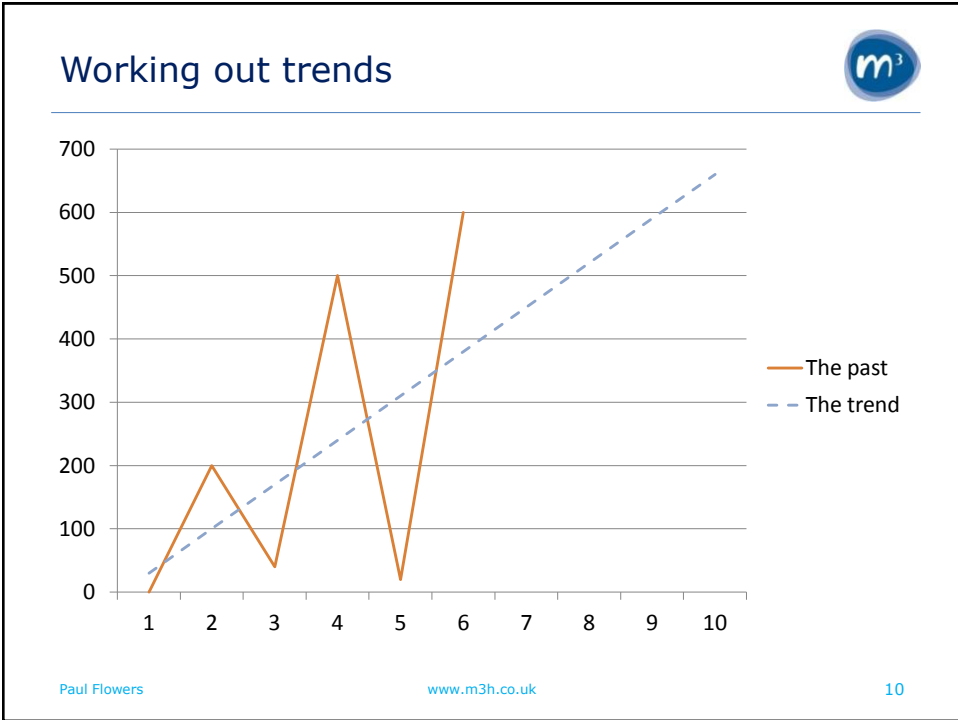


- Is the rent from that stock enough to pay off the loan?
- If not, what is the subsidy required?
  - This comes from other units' rents
  - (Is this best/fair use your rental income?
    - i.e. You fit solid silver taps to half your units, subsidised by spending nothing on the others)
- Would you be better off selling the house?


## Meeting the cost of borrowing

- Borrowing will be paid for from future rental income, less operating costs
- How do you estimate future income and operating costs?
- Use cash flow projections
  - Based on past trends

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## How to project cash flows



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- Start with current rent and operating costs
- Project your rent and costs
  - According to past trends
  - What about future inflation?
    - (Retail Price Index with housing cost)
    - (Consumer Price Index without)
- What is inflation?
  - The year-on-year increase in the cost of goods and services, or 'cost of living'
  - Why does this happen? One explanation:

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## The cycle of wage inflation



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## Common inflation assumptions



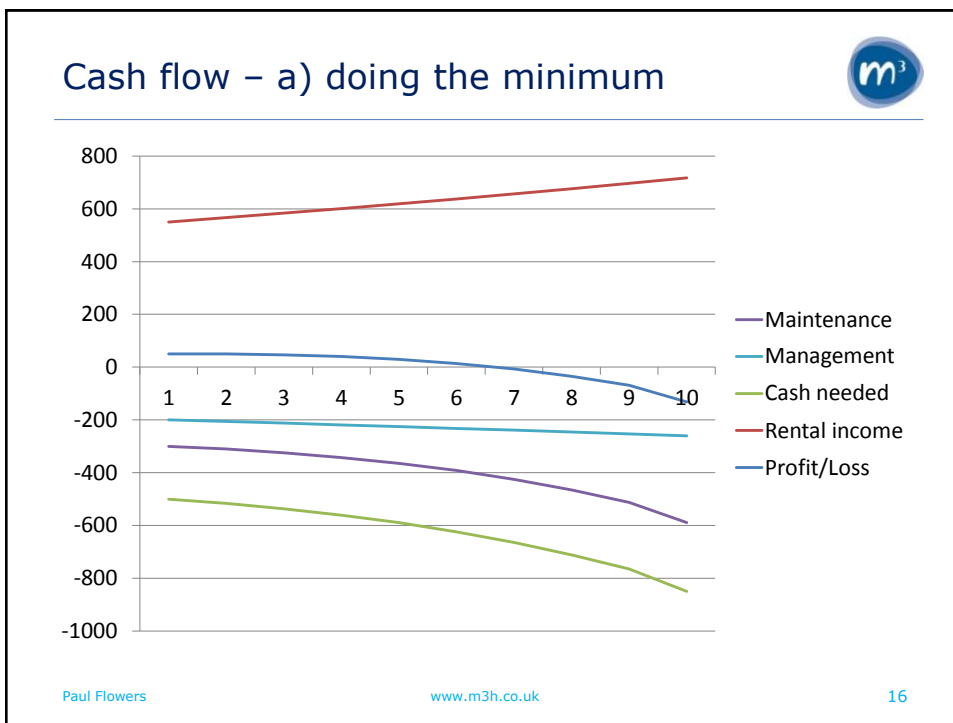
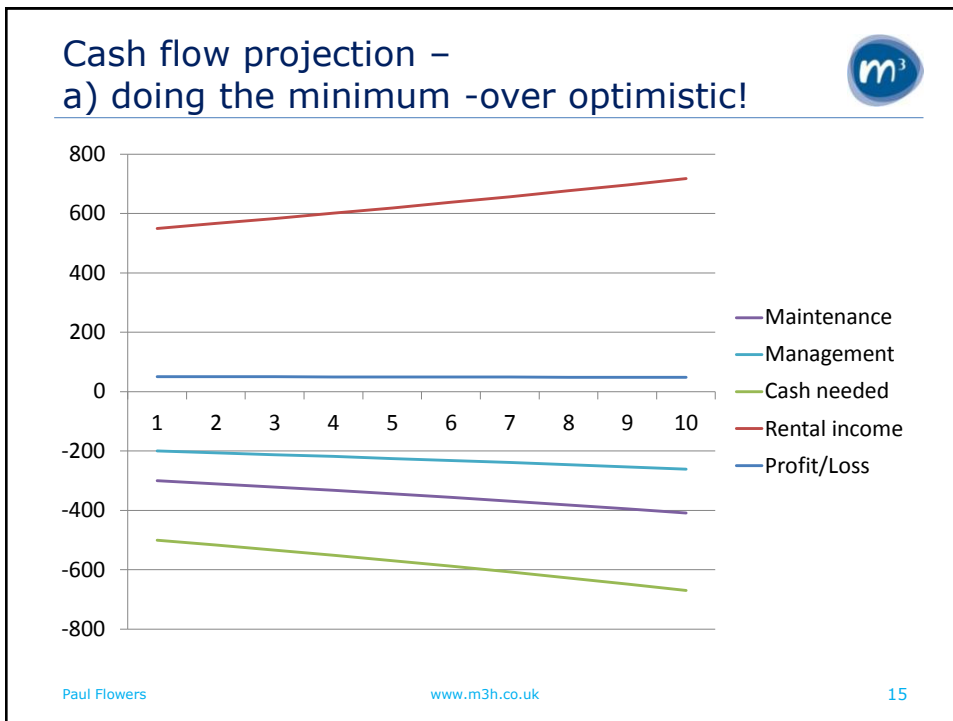
- Rent RPI + 1/2
  - Controlled by the TSA
- Management RPI + 0
  - You get 'cost of living'
- Maintenance RPI + 1
  - Materials and labour rise faster
    - Increase in copper prices?
    - DLO or contractor? Agreed terms?

## Classic option appraisal question

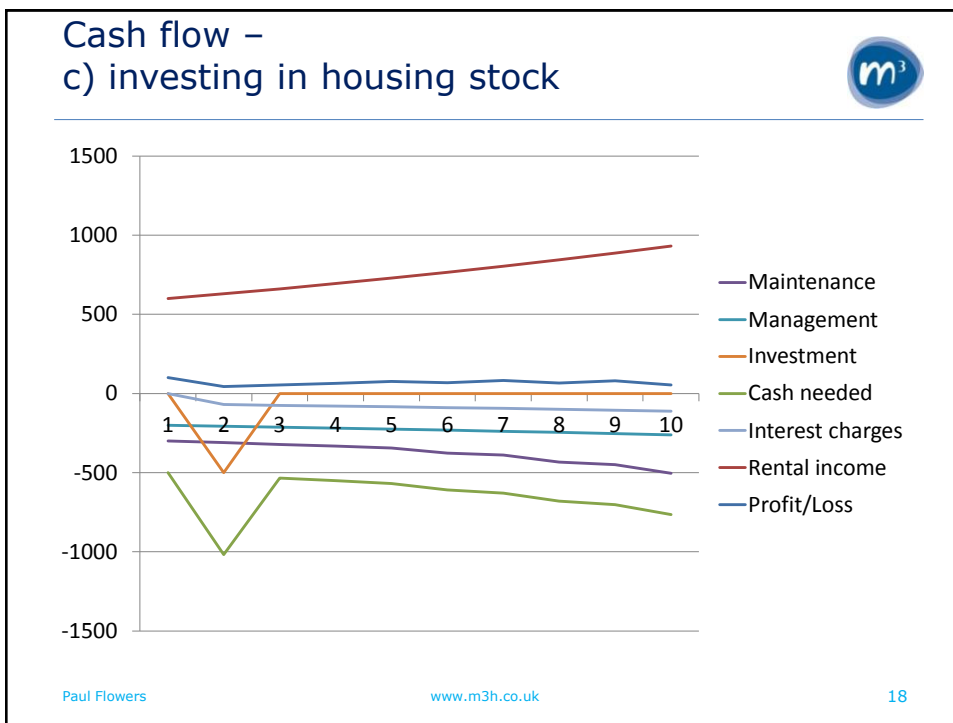
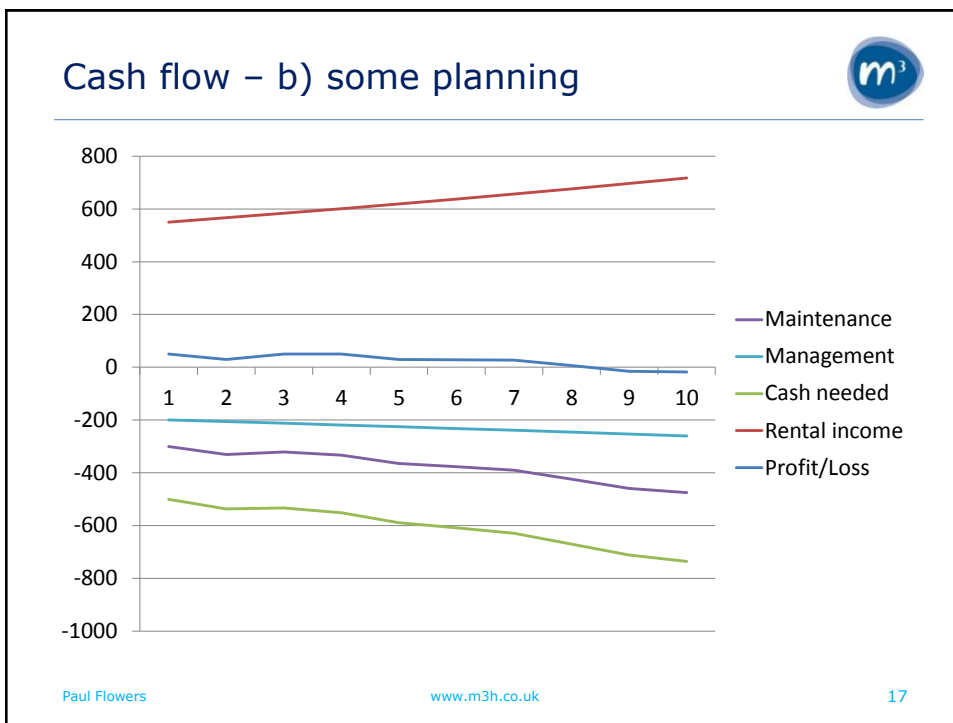


- In maintaining a unit, what is the financial impact on your organisation of:
  - A. Doing the bare legal minimum each year?
  - B. Carrying out some planned maintenance?
  - C. Heavily investing now, to get lower costs in the future?

What would these projections look like?







## Which option is best?



- What are you looking for?
  - Cheapest in the long run?
    - Could be 'run into ground' option!
  - Smallest impact on the cash flow?
    - Could be 'borrow loads' option
  - Smallest subsidy from existing units?
  - Least borrowing / spending from reserves?
- How do you tell?
- You need some 'KPIs'.....

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## Key Performance Indicators



- Standard, commonly used calculations
  - Also called 'hurdles', 'financial tests' etc
- Showing
  - Absolute cost
  - Surplus/subsidy
  - Whether you can support the borrowing
  - Whether you should do option A, B or C
    - Including relative risk
- How are they calculated?

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## Common KPIs



- NPV of Net Rent
  - For comparing ongoing maintenance options
  - Also called EUV, EUV-SH
- NPV Surplus
  - When looking at upfront investment
  - Will also look at IRR
- Payback
  - When looking at upfront investment that should generate additional income
  - i.e. FIT

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## Net Present Value (NPV, EUV etc)



- NPV /EUV =
  - Total Net Rent in today's money
    - where
  - Net Rent =  
Rent – Management – Maintenance

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## NPV – what does ‘today’s money’ mean?



- The value of money falls over time
  - i.e. you lend a friend £10 tonight in the bar
  - She buys 4 drinks
  - She avoids you for 20 years, then gives you £15
  - You buy 3 drinks
- Your appraisal should take the future value of money into account

## Calculating the NPV of the Net Rent



- Convert future Net Rent into today’s money by ‘discounting’ it back to year one

Year	Net Rent	Net Rent – today’s money
1	100	100
2	102	99
3	105	98
4	106	97
5	109	96
6	113	95
<b>Total</b>	<b>635</b>	<b>585</b>

## NPV calculation – further explanation



- The NPV is the rewinding of a compound interest calculation
- What's the value of £10 in 10 years, at an interest rate of 6%?
  - $= 10 \times 1.06 \times 1.06 \times 1.06 \times 1.06 \times 1.06 \times 1.06 \times 1.06 \times 1.06 \times 1.06 \times 1.06 = \text{£}17.90$
- If someone gives you £17.90 in 10 years, what's the value now?
  - $= 17.90 / 1.06 / 1.06 / 1.06 / 1.06 / 1.06 / 1.06 / 1.06 / 1.06 / 1.06 / 1.06 = \text{£}10$

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## What rate do we use to calculate the value of future money in today's prices?



- The last slide used 6% to convert £17.90 from year 10 into today's prices
  - To match the interest rate used going the other way
- The technical term for the rate used to convert is the **discount rate**
  - The discount rate is often the most important financial assumption in your appraisal
  - More about this later on

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## NPV – why can't you do the simple calculation?



- Why not just add up your maintenance?
  - You could, if only maintenance mattered, and there was no borrowing cost...
  - $£100 * 1.035 = £103.50$  next year,  
 $= £103.50 / 1.035 = £100$  discounted back
- Can't work if you are looking at multiple revenues, using different inflation
- They must all fall in value at the same rate
  - Otherwise ratio of cost to spend falls apart
    - i.e. What is maintenance as % rent?

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## Ratio of rent to maintenance



Year	Rent	Maint	Rent/Maint	Rent	Maint	Rent/Maint	Rent	Maint	Rent/Maint
1	100	10	10%	100	10	10%	100	10	10%
2	103	10.35	10.05	100	10	10%	95.23	9.57	10.05
3	106.09	10.71	10.10	100	10	10%	94.31	9.52	10.10
4	109.27	11.09	10.15	100	10	10%	93.41	9.48	10.15
5	112.55	11.48	10.20	100	10	10%	92.51	9.43	10.20
6	115.93	11.88	10.25	100	10	10%	91.62	9.39	10.25

Purple      Inflated – Rent 3%, Maint 3.5%

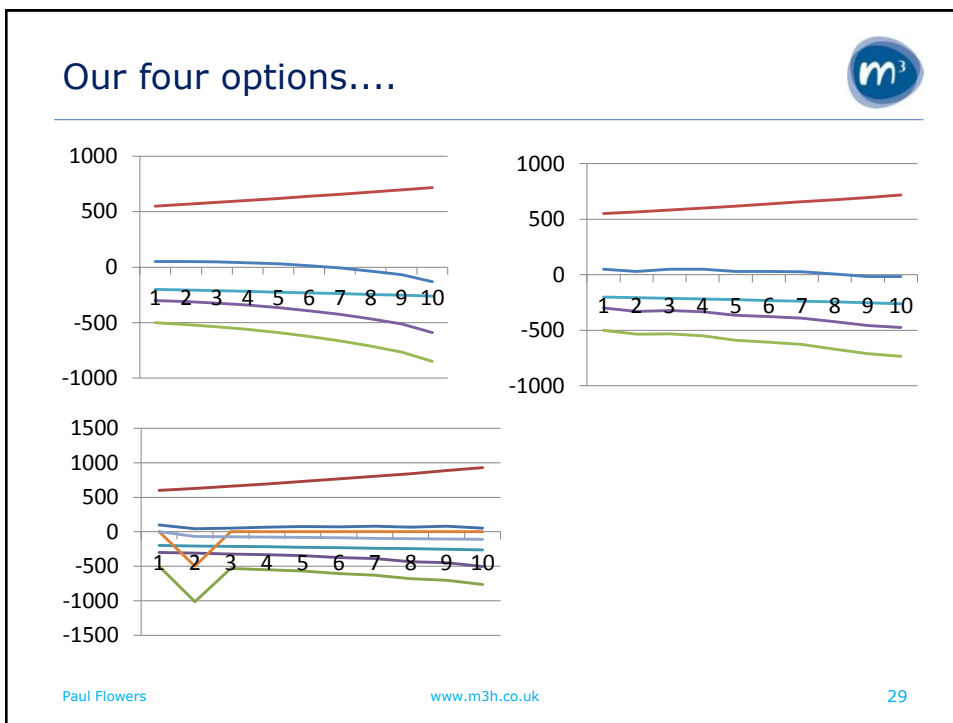
Blue        Discounted – Rent 3%, Maint 3.5%

Green       Discounted – Rent 4%, Maint 4%

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### NPV (EUV) results

**Total Net Rent in today's money:**

- a) – do minimum            +£52k
- b) – some planning        +£200k
- c) – heavy investment    +£510k
- d) – sell                      +£180k

- What have we forgotten?
- The loan for cost of works on C!
- Putting this in gives us our NPV Surplus

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## NPV Surplus



- NPV Surplus =
  - Total Net Rent in today's money
  - Minus
  - The money you are borrowing today
- a) – do minimum      £52k – 0 = 52k
- b) – some planning    £200k – 0 = 200k
- c) – heavy investment £510k – 500 = 10k

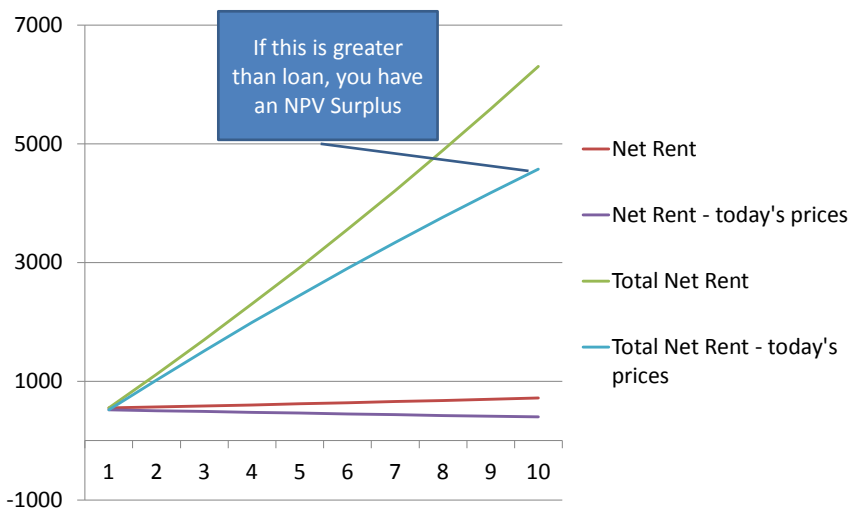
NPV surplus for c) – borrowing is paid for by rental income (-ve would mean a subsidy)

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## Discounting the Net Rent



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## Net Present Value – discount rate for investment



- You are investing this year, and the loan interest rate is 6%
- You therefore need to make 6% return each year just to cover the interest
- Therefore, use 6% when converting future income to today's prices
  - This incorporates the loan interest into the NPV calculation
- If Total Net Rent discounted @ 6% > loan, you have an NPV Surplus

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## PV investment scheme

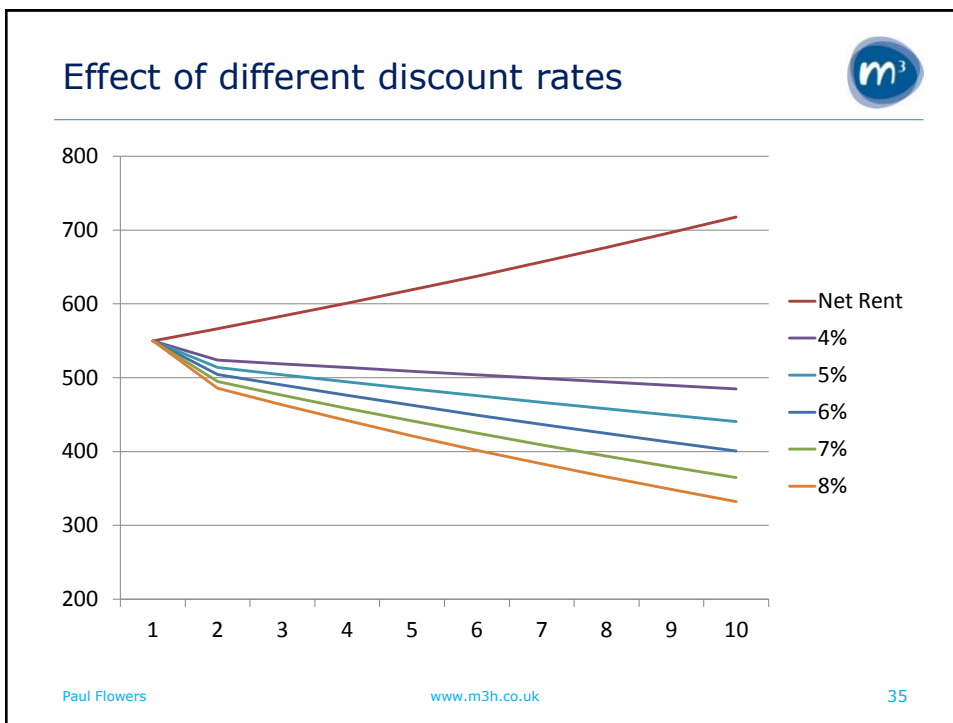


- Just like Option C – Investment
- Cost of PV = X
- Income = Y
- Maintenance = Z
  
- NPV Surplus =  $NPV(Y-Z) - X$ 
  - But which discount rate should you use?

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- ### Why use higher rates?
- Higher discount rates reflect risk
  - Recommended on FIT schemes
  - If your scheme still makes an NPV surplus when income is discounted higher than borrowing, you have a safety cushion
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## Effect of different discount rates



	4%	5%	6%	7%	8%
Borrowing	100	100	100	100	100
Total Net Rent	160	160	160	160	160
NPV Net Rent	130	120	110	100	90
Surplus/ Deficit	30	20	10	0	-10

- If your normal rate was 6%, a risky scheme using 7% would still just work
- You have a 10k cushion

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## What if you don't want to use higher rates?



- Look at the IRR (Internal Rate of Return)
- The IRR is the discount rate that would give you an NPV surplus of 0
  - Regardless of which rate you actually use
  - It's a sensitivity test
  - An iterative goal seek
    - Excel scrolls through rates +-5% from your rate until it finds the answer
    - If no answer, your scheme is really good or really bad

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## The IRR (Internal Rate of Return)

	4%	5%	6%	7%	8%
Borrowing	100	100	100	100	100
Total Net Rent	160	160	160	160	160
NPV Net Rents	130	120	110	100	90
Surplus/Deficit	30	20	10	0	-10

- If your rate is 6%, the IRR here is 7%

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## Cash flow measures

- NPV calculations look at the cost, but not the cash flow
- You need to look at the cash flow!
  - Even if the rent supports the loan in the long term, what about the next few years?
- What about the breakeven or payback?
  - They are not the same thing, but often get confused with each other

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## When does an investment break even, or pay back?



- PV company fudged calculations
  - Cost = 10k
  - Income from FIT– 1k a year
  - Break even / payback– 10 years
- No!
  - Borrowing cost – 10k
  - Interest cost – 600 in first year
    - (extra maintenance cost of pv cells?)
  - 1k a year FIT used to reduce borrowing?

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## Real Breakeven and Payback

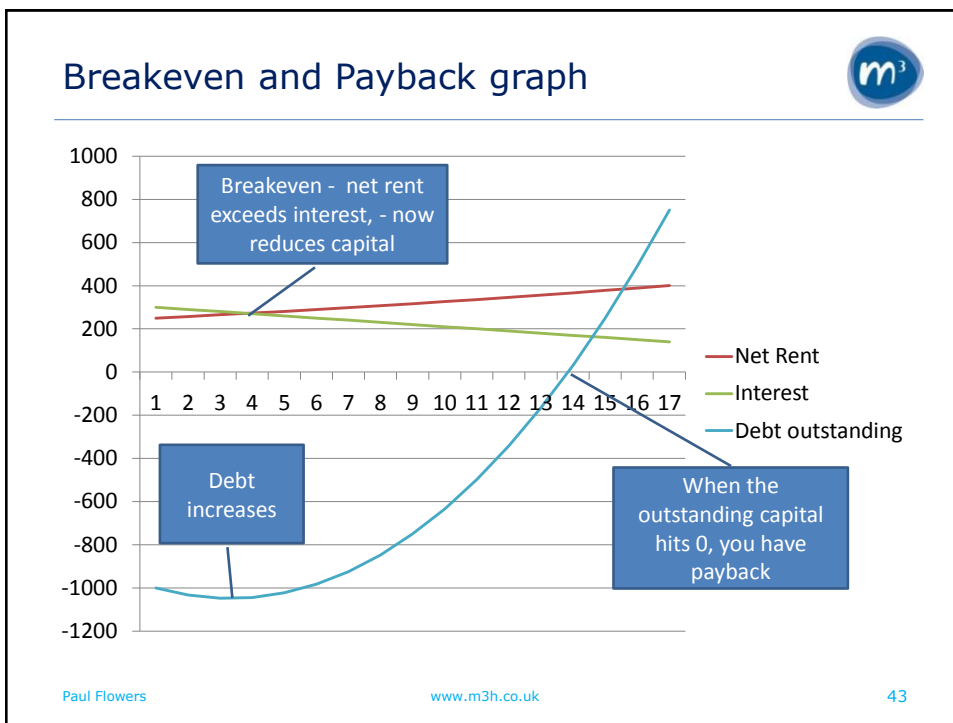


- **Breakeven**
  - When the Net Rent  $\geq$  Interest payments
- **Payback**
  - You have enough cash to pay back the whole loan

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- ### Assumptions – don't assume anything
- The future projection is based on someone's assumptions
  - Your organisation's appetite for stock reinvestment is reflected in those assumptions
    - So is your appetite for FIT schemes
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## Types of assumptions

- Revenues
  - Management / Maintenance costs
  - Inflation and voids
- Borrowing
  - Mortgage rate
- NPV
  - Discount rate
  - Discount period

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## Maintenance assumptions

- How much are you assuming maintenance costs rise by, for old stock?
  - A) whatever's agreed in our contract
  - B) we've got a DLO – not much
  - C) we've got a DLO - loads
  - D) something else

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## Management costs



- How much does it cost to manage a recently renovated home?
  - a) less than existing stock in the short term
  - b) the same as existing stock
- Conversely, if you 'do nothing', how much does it cost to manage a knackered home?
  - a) more than existing stock – more problems
  - b) the same as existing stock

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## Void assumptions



- What is the void/bad debt rate on a run-down property?
  - A) none – people queuing up. We only operate in London, dahling
  - B) much higher – we've got some real rubbish
  - C) The same as existing stock?
- Your assumptions on the trend in running costs could make option a) the best, or worst, outcome....

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## Borrowing assumptions



- Very little you can do - your treasury team will always try for best deals, given:
  - The size of your organisation
  - Your credit-worthiness
- Could impact on payback and other KPIs
- But..
- If you wait a year, will the new deal be in place?
  - i.e. If you postpone a project, will you then have a 5% rate instead of a 6.5%?

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## Discounted cash flow (NPV) assumptions



- Discount rate cannot be lower than borrowing rate
  - If it is higher, how much higher?
- Discount period?
- Huge variation in new build length– 30 to 80 years
  - *See Housing investment appraisal – NHF*
  - An organisation appraising over 80 years will find it easier to make an NPV Surplus than one appraising over 30

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