**Problem**

A firm is planning to create an electric vehicle Gigafactory. This will have either 100 assembly machines (for a small facility) or 250 assembly machines (for a large facility). The current net revenue per machine is £28,000. Next year this will either rise to £37,500 (with a 65% probability) or fall to £11,500 (with probability 35%) – and stay there forever after. The variable cost for constructing is £170,000/machine plus a fixed cost of £3,200,000 for a small facility or £29,000,000 for a large facility. Assume the facoty is built this year and revenues are generated right away. The risk-free rate is 10%. Which facility will the company choose and how much money will they make (in millions)?

**Solution**

By using the formula for an infinite geometric series ( =first term, =ratio, ):

100 machines give a PV of:

100\*[28,000 – 170000 + ] – £3,200,000 = £11,000,000

250 machines give a PV of:

250\*[28,000 – 170000 +] – £29,000,000 = 6,500,000

So, the company will choose the small facility and get £11,000,000 = £**11**M

**Answer: 11**