

# THINK BIG



‘Grossing-up’ calculations are examined frequently. Doug Williamson explains how to master them and boost your exam marks

“Candidates struggled... even with the first step of estimating the effective loan amount if a minimum balance of 20% of the loan amount is to be maintained [in a non-interest-bearing current account].”

Excerpt from Corporate Finance and Funding (CFF) Examiner’s Report, October 2011

Estimating the effective loan amount without a struggle in the exam required:

- 1 Knowing how to do a ‘grossing-up’ calculation; and
- 2 Recognising that one was needed.

Let’s recap what a grossing-up calculation involves, and what it doesn’t. Then we’ll apply it to some exam-based examples.

## How to gross up

Grossing up means increasing a net amount using the following relationship:

$$\text{Gross amount} = \frac{\text{Net amount}}{(1 - \text{grossing-up rate})}$$

A common example is grossing up interest for income tax or withholding tax.

For example, net interest is £100 and the tax rate is 20% (= 0.20).

In this case:

$$\text{Gross interest} = \frac{\text{Net interest } \pounds 100}{(1 - 0.20 = 0.80)} = \pounds 125$$

Note: The tax is charged on the gross amount of £125 (x 20% = £25 tax).

This is why the calculation is to DIVIDE BY (1 – tax rate) to give the right answer of £100/(1 – 0.20) = £125.

The calculation is *not* to multiply by (1 + tax rate). This would give a wrong

answer of £100 x (1 + 0.20) = £120, which is too small.

(Because tax payable at 20% on £120 = £24; and when £24 tax is deducted from £120, only £96 remains, not the required £100.)

## Gross interest calculation

20% tax	Gross interest £100 ÷ (1 - 0.20 = 0.80) = £125
Net interest £100	

Now, let’s prove that our answer is right.

## Check gross interest

20% tax x £125 = £25	= Gross interest £125
+ Net interest £100	

## How to earn triple marks

A recent CFF exam offered marks for no fewer than three separate grossing-up calculations. Some candidates got all three wrong or didn’t attempt them. Or perhaps they didn’t realise that grossing up was needed.

Happier candidates who had understood and practised the grossing-up technique – and spotted where it was relevant – scored marks in all three places.

## Grossing up a loan (easy)

CFF summarised extracts, October 2011: *The treasurer of Misbah plc wishes to raise a net amount of at least EUR 20m and is considering:*

*A line of credit from the company’s bankers at an interest rate of 5.5% per annum, with an accompanying requirement that, for the duration of the loan, a minimum balance of 20% of the loan amount should be maintained in the company’s non-interest-bearing current account with the bank.*

Part of the question required evaluation of the true cost of this loan facility.

## How to gross up the loan

Interest will be charged (at 5.5%) on the gross loan amount, not the net.

So the first step is to calculate the gross loan amount.

The 20% balance to be maintained in the current account is not available for the borrower during the life of the loan. It is locked away (like the 20% tax that was payable in our earlier example).

So this grossing-up calculation will be very similar to the gross interest calculation that we did earlier.

## Loan grossing-up calculation

20% in current a/c	Gross loan amount EUR 20m ÷ (1 - 0.20 = 0.80) = EUR 25m
Net loan amount EUR 20m	

Now, prove the answer.

## Gross loan amount check

20% x 25m = EUR 5m	= Gross loan amount EUR 25m
+ Net loan amount EUR 20m	



EUR 25m is the amount on which interest will be calculated and charged by the bank. Even though only EUR 20m will be available to the borrower (EUR 5m = 20% being locked in the current account). In the exam, as in life, this loan is more expensive than it appears to be.

### Similar candidate errors in share issues

*“Many candidates made errors at the first step of estimating the gross value of share issue required to raise a net amount of £24m after issue costs amounting to 4% of the gross proceeds.”*

CFF Examiner’s Report, October 2011

### Gross share issue calculation

CFF summarised extracts, October 2011:  
*Flot proposes to obtain a quotation on the London Stock Exchange and raise additional share capital for a net amount of £24m. Administration and issue costs are expected to be 4% of the gross receipts.*

Part of this question required calculating the gross receipts.

### How to gross up the issue receipts

The share issue is good news for the advisers because of the fees they will earn.

The 4% total costs paid to the administrators and advisers are not available for Flot. But they will be part of the total subscription price paid by the investors.

So the shape of this grossing-up calculation is similar to the previous one.

### Gross proceeds calculation

4% costs	Gross issue proceeds
Net issue proceeds	£24m ÷
£24m	(1 - 0.04 = 0.96)
	= £25m

Now, proving it.

### Gross proceeds check

4% x £25m = £1m	= Gross issue proceeds
+ Net issue proceeds	£25m
£24m	

So £25m is the total amount that Flot needs to attract from its investors.

### And a ‘simple statement’

*“Many candidates were unable to find the correct company beta using the information provided – which simply stated that ‘the beta of the market is 37.5% less than the beta of Wik plc.’”*

CFF Examiner’s Report, October 2011

This was the hardest grossing-up calculation in the same exam. But the basic grossing-up idea was exactly the same.

### Beta calculation (hard)

CFF summarised extracts, October 2011:

*For Flot’s share issue to be successful, the company has been advised that it should make the issue by means of a comparison with an appropriate quoted company. The most appropriate company for this purpose is considered to be Wik plc.*

*The beta of the market is 37.5% less than the beta of Wik plc.*

Part of this question required calculating Wik plc’s beta.

### How to gross up the market beta

For this part we need to know:

- 1 How to do a grossing-up calculation as practised above; and
- 2 That the beta of the market (to gross up) is always 1 by definition.

There is a difference of 37.5% between the beta of Wik plc and the beta of the market, defined as a proportion of the beta of Wik plc (to be calculated).

### Beta grossing-up calculation

37.5% difference	Beta of Wik plc
Beta of the market	1.0 ÷
1.0	(1 - 0.375 = 0.625)
	= 1.6

Let’s prove the calculated beta.

### Beta check

37.5% x 1.6 =	= Beta of Wik plc
0.6	1.6
+ Beta of the market	
1.0	

The market beta of 1.0 is indeed smaller than Wik plc’s beta of 1.6 by 0.6/1.6 = 37.5%.

Note that it is not right to add the 37.5% to 1.0 to calculate a beta of 1.375.

This would be too small because the market beta of 1.0 would only be smaller than it by 0.375/1.375 = 27% (rather than the 37.5% we need).

### What to do next

Now you understand grossing up:

- 1 Practise the summarised examples above; and
- 2 Practise these and other full exam questions. It’s only by practising the full exam questions that you make your new knowledge fully robust under exam conditions.

Then you can score full marks for grossing up if it appears again in your real exam. ♥

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