

CALCULATING THE FREE CASH FLOWS WHEN THERE ARE NEGATIVE PROFITS

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An example

We start of with a simple example. A firm which has no depreciation, no changes in NWC, and no capital expenditures, has the following profits in two successive years:

Exhibit 1		
Profit & Loss with Carryforward		
	Year 1	Year 2
EBIT	-100	+400
Interest	-50	-80
Profit before tax	-150	320
Loss carryforward	0	-150
Taxable income	-150	170
Taxes (30%)	0	-51
Profit after tax	-150	119

To calculate the FCFs of the firm, we calculate the P&L which it would have had (including tax carryforwards) if it had no interest payments:

Exhibit 2		
FCF with no Debt		
	Year 1	Year 2
EBIT	-100	+400
Interest	0	0
Profit before tax	-100	400
Loss carryforward	0	-100
Taxable income	-100	300
Taxes (30%)	0	-90
Profit after tax=FCF	-100	210
FCF (add back loss carryforward)	-100	310

The loss carryforward is added back to the PAT since it is a *non-cash* charge against earnings (like depreciation). We can also do this calculation directly from the Profit and Loss Statement

Exhibit 3 Calculating FCF from P&L		
	Year 1	Year 2
EBIT	-100	400
Interest	-50	-80
Profit before tax	-150	320
Loss carryforward	0	-150
Taxable income	-150	170
Taxes (30%)	0	-51
Profit after tax	-150	119
FCF calculation		
Profit after tax, with carryforwards	-150	119
Add back loss carryforward		150
Add back interest, net of tax	50	56
Subtract out interest tax shield, carryforward		-15
Free Cash Flow	-100	310

What is the value of the firm?

As in all cases, the value of the firm is the unlevered value (i.e., the present value of the FCFs discounted at the WACC) plus the value of the tax shields. Here we will have:

$$PV(\text{net interest paid out}) = \frac{[(1-t_d)-(1-t_e)]50}{(1+(1-t_d)i)} + \frac{[(1-t_d)-(1-t_e)(1-t_c)]80 + 50(1-t_e)t_c}{(1+(1-t_d)i)^2}$$

This has simple explanation: In year 1, the stakeholders in the firm get a net after-tax benefit of interest of $[(1-t_d)-(1-t_e)]50$, instead of the net tax benefit of $[(1-t_d)-(1-t_e)(1-t_c)]50$ which they would have gotten if the firm had been fully taxed at the corporate level. Thus the firm's stakeholders *lose*

$$\begin{aligned} & [(1-t_d)-(1-t_e)(1-t_c)]50 - [(1-t_d)-(1-t_e)]50 = [(1-t_e)-(1-t_e)(1-t_c)]50 \\ & = (1-t_e)[1-(1-t_c)]50 = (1-t_e)t_c 50 \end{aligned}$$

In the next year, when they can realize the carryforwards, they get this back. For practical purposes, I would ignore this aspect of loss carryforwards in the valuation (i.e., stick with $V(U) = V(L)$).