

CHAPTER TEN

The Analysis of the Cash Flow Statement

Concept Questions

C10.1 If the analyst uses discounted cash flow analysis, he must analyze the source of the cash flows, in order to forecast the cash flows.

C10.2 1. For discounted cash flow valuation.

2. For forecasting liquidity, to see if debt payments can be covered by cash flow.

3. More generally for financial planning, to ensure enough cash is raised to meet debt repayments, dividends and investment requirements.

C10.3 Free cash flow must be paid out in dividends as there are no debt financing flows.

For a pure equity firm,

$$C - I = d$$

C10.4 Excess cash can result from operations generating cash. Yet the GAAP statement presentation reduces net cash from operations (free cash flow) by the amount of the excess cash that operations generate. The generation and disposition of free cash flow are confused.

C10.5 The direct method gives considerably more detail on the sources of cash from operations. But the indirect method gives the accruals for the period.

C10.6 No. This interest is a cost of financing construction, not investment in the construction. It should be in the financing section of the statement, not the investing section

C10.7 Because a firm increases its free cash flow by selling off assets (and reduces free cash flow by acquiring assets).

C10.8 The free cash flow is likely to be negative: growth requires new investment in excess of cash generated from operations, resulting in negative free cash flow.

C10.9 Current free cash flow is reduced by investment that generates future cash flow. So the lower the current free cash flow (because of investment), the higher future free cash flow is likely to be.

C10.10 As $C - I = OI - \Delta NOA$, free cash flow grows with growth in operating profits, but declines with growth in investment in net operating assets.

Exercises

E10.1 Analyzing Cash Flows

- a) As there is no debt or financial assets,

$$\begin{aligned} C - I &= d \\ &= \$150,000 \end{aligned}$$

OR

As there is no change in shareholders' equity and no financial income or expenses,

$$\begin{aligned} OI = NI &= d \\ &= \$150,000 \end{aligned}$$

and

$$\begin{aligned} C - I &= OI - \Delta NOA \\ &= \$150,000 - 0 \\ &= \$150,000 \end{aligned}$$

- b) The increase in cash comes from operations, the sale of land (and dividends decreased the cash):

Cash from operations = $NI - \Delta \text{Accs. Rec.} - \Delta \text{Inv.} + \text{depr.} + \Delta \text{Accs. payable}$

$$= \$150,000 - 40,000 - 100,000 + 100,000 + 25,000$$

$$= \$135,000$$

Sale of land	<u>\$400,000</u>
	<u>\$535,000</u>
Dividends	<u>150,000</u>
Changes in cash	<u>\$385,000</u>

- c) The investment in financial assets would not be an investment in operating assets (I), so

$$\begin{aligned} C - I &= OI - \Delta NOA \\ &= \$150,000 - (615,000 - 1,000,000) \\ &= \$535,000 \end{aligned}$$

OR

$$\begin{aligned} C - I &= d + F \\ &= \$150,000 + \$385,000 \\ &= \$535,000 \end{aligned}$$

E10.2 Free Cash Flow for a Pure Equity Firm

For a pure equity firm,

Free cash flow ($C - I$) = d

Net dividends for 2003:

Dividends paid	\$ 8.3 million
Shares issued	<u>\$34.4 million</u>
	<u>-\$26.1 million</u>

So free cash flow is -\$26.1 million

Another solution

Earnings	= $\Delta CSE + \text{net dividend}$
	= $51.4 - 26.1$
	= \$25.3 million

$C - I = OI - \Delta NOA$

As, for a pure-equity firm, $OI = \text{Net earnings}$ and $NOA = CSE$, then

$C - I$	= $25.3 - 51.4$
	= -26.1 million

E10.3 Free Cash Flow for a Net Debtor

See the solution to Exercise E10.2 in the chapter. For a net debtor firm,

$$C - I = d + F$$

$$\begin{aligned} \text{Net cash to debtholders (F)} &= \text{cash interest} + \text{principal repayments} \\ &= 4 + 16.9 \\ &= 20.9 \text{ million} \end{aligned}$$

(principal repayments are the decline in net debt).

As the net dividend is -26.1,

$$\begin{aligned} C - I &= -26.1 + 20.9 \\ &= -5.2 \end{aligned}$$

OR

$$\begin{aligned} C - I &= OI - \Delta NOA \\ &= 29.3 - 34.5 \\ &= -5.2 \end{aligned}$$

where

$$\begin{aligned} OI &= \text{Earnings (25.3)} + \text{NFE (4.0)} = 29.3 \\ \Delta NOA &= \Delta CSE - \Delta NFO \\ &= 51.4 - 16.9 = 34.5 \end{aligned}$$

E10.4 Applying Cash Flow Relations

$$\begin{aligned}
 \text{(a)} \quad \Delta \text{NOA} &= \text{OI} - (\text{C} - \text{I}) \\
 &= 390 - 430 \\
 &= - \$40 \text{ million}
 \end{aligned}$$

(The firm reduced its investment in net operating assets.)

$$\text{(b)} \quad \text{OI} = \text{C} - \text{I} + \text{I} + \text{operating accruals}$$

$$\begin{aligned}
 \text{So, operating accruals} &= \text{OI} - (\text{C} - \text{I}) + \text{I} \\
 &= 390 - 430 - 29 \\
 &= - \$69 \text{ million}
 \end{aligned}$$

OR, as ΔNOA is made up of investment and operating accruals,

$$\begin{aligned}
 \text{Operating accruals} &= \Delta \text{NOA} - \text{I} \\
 &= - 40 - 29 \\
 &= - \$69 \text{ million}
 \end{aligned}$$

$$\text{(c)} \quad \text{C} - \text{I} = \text{NFE} - \text{DNFs} + d$$

So, with a negative net dividend of \$13 million

$$\begin{aligned}
 \Delta \text{NFO} &= \text{NFE} + d - (\text{C} - \text{I}) \\
 &= 43 - 13 - 430 \\
 &= - \$400 \text{ million}
 \end{aligned}$$

(The firm reduced its NFO by \$400 million by applying free cash flow and the net dividend to reducing net debt).

E10.5 Applying Cash Flow Relations

- (a) Use the free cash flow generation equation: $C - I = OI - \Delta NOA$

As there was no net financial income or expense, operating income (OI) equals the comprehensive income of \$100 million. The net operating assets for 2003 and 2002 are as follows:

	<u>2003</u>	<u>2002</u>
Operating assets	640	590
Operating liabilities	<u>20</u>	<u>30</u>
NOA	<u>620</u>	<u>560</u>

$$\begin{aligned}
 C - I &= OI - \Delta NOA \\
 &= 100 - 60 \\
 &= \$40 \text{ million}
 \end{aligned}$$

- (b) Use the free cash flow disposition equation: $C - I = \Delta NFA - NFI + d$

$$\begin{aligned}
 \text{The net dividend (d)} &= \text{comprehensive income} - \Delta CSE \\
 &= 100 - 160 \\
 &= -\$60 \text{ million (a net capital contribution)}
 \end{aligned}$$

The net financial assets for 2003 and 2002 are as follows:

	<u>2003</u>	<u>2002</u>
Financial assets	250	110
Financial liabilities	<u>170</u>	<u>130</u>
NFA	<u>80</u>	<u>(20)</u>

$$\begin{aligned}
 C - I &= \Delta NFA - NFI + d \\
 &= 100 - 0 - 60 \\
 &= \$40 \text{ million}
 \end{aligned}$$

The firm invested the \$40 million of free cash flow in financial assets. In addition, it raised a net \$60 million from shareholders which it also invested in financial assets.

- (c) Net financial income or expense can be zero if financial income and financial expense exactly offset each other. This firm moved from a net debtor to a net creditor position in 2003 such that the weighted-average net financial income was zero.

E10.6 Calculating Free Cash Flow: Ben & Jerry's

First reformulate the financial statements:

	<u>Balance Sheets</u>		
		<u>1996</u>	<u>1995</u>
Operating assets (OA):			
Trade receivables		8.7	11.7
Inventories		15.4	12.6
Other current operating assets		7.1	7.5
Plant, net		65.1	59.6
Equity investments		1.0	1.0
Other long-term operating assets		<u>2.5</u>	<u>2.4</u>
		99.8	94.8
Operating Liabilities (OL):			
Trade payables and accrued expenses	17.4		16.5
Deferred tax liability	<u>4.8</u>	<u>22.2</u>	<u>3.5</u>
			20.0
Net operating assets (NOA)		77.6	74.8
Net financial assets (NFA):			
Short-term investments	36.6		35.4
Other receivables	0.3		0.9
Current debt	(0.6)		(0.5)
Long-term debt	<u>(31.1)</u>	<u>5.2</u>	<u>(32.0)</u>
			3.8
Common shareholders' equity (CSE)		<u>82.8</u>	<u>78.6</u>

	<u>Income Statements</u>		
		<u>1996</u>	<u>1995</u>
Net sales		167.1	155.3
Cost of sales		<u>115.2</u>	<u>109.1</u>
Gross profit		51.9	46.2
SG&A expense		(45.5)	(36.4)
Other income (expense)		<u>0.2</u>	<u>(0.6)</u>
OI before tax		6.6	9.2
Tax reported	2.4		3.5
Tax on financing income	<u>0.1</u>	<u>2.5</u>	<u>(0.1)</u>
OI after tax		4.1	5.8
Interest income	1.7		1.7
Interest expense	<u>(2.0)</u>	<u>(1.5)</u>	
Net interest before tax	(0.3)	.2	



Tax (35%)	(0.1)	0.1
Net financial expense	.2	.1
Net comprehensive income	<u>3.9</u>	<u>5.9</u>

[Note: There is no dirty-surplus income as cumulative currency adjustments did not change.]

Free cash flow can be calculated using Method 1 and Method 2 in the text. Method 3 calculates free cash flow directly from the cash flow statement.

Method 1:

$$\begin{aligned}
 C - I &= OI - \Delta NOA \\
 &= 4.1 - 2.8 \\
 &= \$ 1.3 \text{ million}
 \end{aligned}$$

Method 2:

$$\begin{aligned}
 C - I &= \Delta NFA - NFI + d \\
 &= 1.4 - (-0.2) - 0.3 \\
 &= \$1.3 \text{ million}
 \end{aligned}$$

The negative dividend is plugged from the change in equity:

$$d = \text{Earnings} - \Delta CSE = 3.9 - 4.2 = - 0.3$$

Note that, while Ben & Jerry's had net financial assets, it reported net financial expense (because the interest rate on obligations was higher than that on assets).

Method 3 (from cash flow statement):

Reported cash from operations		14.3
After-tax net interest expense		<u>.2</u>
		14.5
Additions to PPE	12.3	
Sales of PPE	(0.1)	
Investments in other assets	.3	<u>12.5</u>
Free cash flow		<u>2.0</u>

There is a \$0.7 million discrepancy between the Method 3 calculation and that for Methods 1 and 2. This could be due to foreign currency translations or misclassification of operating and financing items.

E10.7 Unlevering Free Cash Flows: Waste Management, Inc.

Net interest before capitalized interest is included in reported cash from operations, and capitalized interest is included in cash investments. Both, however, are financing cash flows. So exclude these flows from free cash flow.

Cash from operations as reported			\$1,502,035
Interest Expense	681,457		
Interest Income	<u>26,829</u>		
	654,628		
Tax effect (38%)	<u>248,759</u>	<u>405,869</u>	
Cash from operations			\$1,907,904
 Cash used in investing activities, as reported	 \$4,555,137		
Short-term investments	\$57,509		
Other investments	76,244		
Capitalized interest	<u>(41,501)</u>	<u>92,252</u>	<u>4,647,389</u>
Free cash flow			<u>\$2,739,485</u>

(As accrual accounting interest was used, this number will be incorrect by the amount of the change in interest accruals over the period.)

E10.8 Analyzing a Change in Free Cash Flow: Wal-Mart Stores

- (a) The main elements that contribute to the increase in free cash flow are:
1. Increase in net income of \$316 million.
 2. A decrease in investment in inventories of \$1,949 million.
 3. An increase in payables and accrued liabilities of \$1,161 million:
extending credit to lever operations.
 4. A decrease in investment in property, plant and equipment.
- (b) The main difference is after-tax interest that is included in the levered reported cash from operations.

E10.9 Analysis of Profitability and Cash Flows: Quantum

	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>
Operating income (after tax)		7,473	92,936	(70,326)
NOA	318,051	293,733	699,234	982,354
Average NOA		305,892	496,484	840,794
(a) RNOA		2.44%	18.72%	-8.36%
Net financial expenses		4,799	11,345	20,130
NFO	(80,149)	(117,539)	189,747	437,531
Average NFO		(98,844)	36,104	313,639
(a) Borrowing costs		*	*	6.42%
OI		7,473	92,936	(70,326)
ΔNOA		(24,318)	405,501	283,120
(b) Free cash flow (C – I)		31,791	(312,565)	(353,446)

Notes:

1. The net borrowing costs for 1994 and 1995 are not calculated. For 1994 there is a net interest expense but there are net financial assets (the interest rate on debt is higher than that on financial assets). In 1995 there is a transition from a net creditor to a net debtor position. The calculated borrowing cost based on average NFO is $11,345/36,104 = 31.42\%$ which clearly is out of line. The new debt must have been issued near the beginning of the year. Using end-of-year NFO, NBC = 5.98%.
- (c) Free cash flow dropped from 1994 to 1995 because of a large increase in investment, despite higher cash flow from operations. Free cash flow declined a little from 1995 to 1996, despite a large drop in cash from operations, because investments declined.

The firm generated negative free cash flow in 1995 and 1996. This could have been entirely financed by issue of equity but was financed by the issue of debt and a sell-off of marketable securities and cash equivalents.

E10.10 What is That in the Cash Flow Statement? Intel

Cash flow from operations as reported		\$9,191
Adjustments:		
After-tax net interest (from income statement)		(470)
		\$8,721
Investments on operations as reported	\$6,506	
Net investment in financial assets	<u>2,043</u>	<u>4,463</u>
Free cash flow		<u><u>\$4,258</u></u>

The eyebrow-raising item is the tax benefit of employee stock plans. This tax benefit is indeed cash from operations because it results from a tax deduction for implicit wages expense. But the corresponding expense (the difference between market value and exercise value of stock issued on exercise) is not deducted from cash from operations. Intel is giving its cash flow from operations a one-sided boost with this adjustment. Up to 2000, many firms included the benefit as a financing flow (by grossing up cash for shares issued on exercise). But this treatment is a misclassification of an operating item. In 2000, the Emerging Issues Task Force (EITF) ruled that the tax benefit should be reported as part of cash operations.

E10.11 Analysis of a Cash Flow Statement for a U.K. Company: Cadbury Schweppes, Plc.

(a) The statement is reformulated as follows to separate free cash flow from financing flows.

Cash from Operations

Cash flow from operations reported	£686
Dividends from associates	<u>12</u>
	698

Net interest paid	60
Tax benefit (31%)	19
Net interest	<u>41</u>

Tax on operations (122 + 19)	<u>(141)</u>
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Cash from operations	557
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Investment in Operations

Purchases of tangible assets	£157	
Disposals of tangible assets	(14)	
Acquisitions and restructurings	100	
Sales of affiliate investments	<u>(21)</u>	<u>222</u>

Free cash flow	<u>£335</u>
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Financing flows

Net interest paid (after tax)	41
Dividends to minorities	30
Payments in "managing liquid resources"	(264)
Payments in "financing"	324
Increase in cash	18
Dividends to shareholders	<u>186</u>

Total financing flows	<u>£335</u>
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(b) The U.K. statement has several advantages:

1. Interest is separated from cash from operations.
2. Cash paid for taxes is clearly presented

3. Capital expenditures and acquisitions are not mixed up with investments in financial assets.
4. The trading in financial assets is distinguished as "management of liquid resources."
5. Cash interest income is disclosed.

Note that cash flow from operations is given as just one number; but the indirect method to explain this number is given in footnotes.

(c) No. The free cash flow in the U.K. statement is cash flow from operations after net interest (levered free cash) minus capital expenditures and dividends. This is cash available for acquisitions and debt and equity financing activities other than dividends.

Minicases

M10.1 Analysis of Cash Flows: Dell Computer

This case deals with some of the frustrations in analyzing free cash flow from GAAP statements but also shows how cash analysis highlights quality concerns about those statements.

The case can be combined with case M12.1 in Chapter 12 or be used as an introduction to it. Background material on Dell is given in that case.

Question A

Calculate free cash flow from reformulated statements. First reformulate the equity statement to retrieve comprehensive income. Then reformulate the balance sheet and income statement.

Reformulated Statement of Stockholders' Equity

(in millions of dollars)

Balance, February 2, 2001		\$5,622
<i>Transactions with shareholders:</i>		
Share issues	\$ 853	
Share repurchases	<u>3,003</u>	(2,150)
<i>Comprehensive income:</i>		
Net income	\$1,246	
Unrealized loss on investments	(65)	
Translation gain	2	
Unrealized gain on derivatives	<u>39</u>	<u>1,222</u>
Balance, February 1, 2002		<u>4,694</u>

Reformulated Balance Sheets

(in millions of dollars)

	<u>1999</u>	<u>1998</u>
Cash	20	20
Accounts receivable	2,094	1,486
Inventories	273	233
Other current assets	791	349
PPE	523	342
Other	<u>15</u>	<u>14</u>
Operating assets	3,716	2,444
Accounts payable	2,397	1,643
Accrued and other	1,298	1,054
Other long-term	<u>349</u>	<u>261</u>
Net operating assets (NOA)	(328)	(514)
Net financial assets (NFA)	<u>2,649</u>	<u>1,807</u>
Common shareholders' equity (CSE)	<u>2,321</u>	<u>1,293</u>

Notes: Only \$20 million of cash is deemed to be working cash.

Net financial assets net cash (less working cash), short-term investments, and long-term investments against long-term debt.

Reformulated Income Statement, 2002

(in millions of dollars)

	<u>1999</u>
Net revenue	\$18,243
Cost of revenue	<u>14,137</u>
Gross margin	<u>4,106</u>
Core operating expenses:	
General and administrative	1,788
Research, development and engineering	<u>272</u>
Total core operating expenses	<u>2,060</u>
Core operating income before tax	<u>2,046</u>
Tax as reported	624
Tax on financial income	<u>13</u>
Tax on operating income	<u>611</u>
Core operating income after tax	1,435
Unusual items	(1)
Operating income	<u>1,434</u>
Net interest income	38
Tax on interest income (35%)	<u>(13)</u>
Core net financial income	25
Comprehensive income	<u>\$1,459</u>

Notes: Gains on derivate investments, translation gains, and unrealized losses on debt investments are in comprehensive income in the equity statement; they are all reported after tax.

Losses on investment income are assumed to be losses from sale of debt investments and the gains on derivative investments are assumed to apply to operations (probably exchange rate hedging).



Calculating free cash flow from these reformulated statements:

Method 1:

$$\begin{aligned}C - I &= OI - \Delta NOA \\&= \$1,325 - (-1,351) \\&= \$2,676 \text{ million}\end{aligned}$$

Note that Dell's NOA are negative and became more negative over 2002.

Method 2:

$$\begin{aligned}C - I &= \Delta NFA - \text{Net financial income} + \text{Net dividend} \\&= 423 - (-103) + 2,150 \\&= 2,676 \text{ million}\end{aligned}$$

Calculating free cash flow from the GAAP statement:

Cash flow from operations reported	\$3,797
Investment expenses, after tax	<u>38</u>
	3,835
Capital expenditures	<u>(303)</u>
<u>Free cash flow (C - I)</u>	<u>\$3,532</u>

Note that the tax benefit from employee stock options has been excluded as the corresponding compensation expense also not included.

Note that purchases and sales of investments (in the investment section of the GAAP statement) are not investments in operations.

The difference between the two free cash flow solutions is large. Why?

- (i) The GAAP statement reports \$487 million in tax benefits of employee stock plans. This is not in operating income in the reformulated statement because the compensation expense (for which the tax benefit is given) is not involved. See below in answer to Question B below.
- (ii) The reformulated statements on the GAAP statements may not have distinguished financing items from operating items appropriately. In particular, some financing revenue must be buried somewhere in the GAAP statement other than under "Investment and other income". More likely, the "other income" in "Investment and other income" is a loss from operations, but we have included it as a financing item. Given that Dell has a net financial asset position of about \$7.5 billion (on average for the period), it should report net investment income, not a loss of \$58 million (unless there are realized losses on some debt investments). If after-tax investment income on the net financial assets is $0.030 \times \$7.5 \text{ billion} = \225 million , the loss that yields the net \$58 loss for this line item is \$283 million.

The investment footnoted reported the following:

The fiscal 2002 loss on investments includes a \$260 million charge in the second quarter for other-than-temporary declines in fair value of its venture investments due to ongoing market conditions.

Another footnote (on derivatives) reveals the following:

The Company also uses forward contracts to economically hedge monetary assets and liabilities, primarily receivables and payables, denominated in a foreign currency. These contracts are not designated as hedging instruments under generally accepted accounting principles, and therefore, the change in the instruments' fair value is recognized currently in earnings and is reported as a component of investment and other income (loss), net. These contracts generally expire in three months or less.

- (iii) Some investments that we have classified as debt investments may be equity investments. Here is the investment footnote:

Investments

The following table summarizes by major security type the fair market value and cost of the Company's investments. All investments with remaining maturities in excess of one year are recorded as long-term investments in the accompanying Consolidated Statement of Financial Position.

Unrealized	February 1, 2002			February 2, 2001		
	Fair Market	Cost	Unrealized Gain	Fair Market	Cost	Gain
	Value			Value		
Debt securities:						
U.S. corporate and bank debt	\$ 2,393	\$ 2,375	\$ 18	\$ 1,451	\$ 1,439	\$ 12
State and municipal securities	87	84	3	105	104	1
U.S. government and agencies	1,663	1,657	6	449	439	10
International corporate and bank debt	168	165	3	-	-	-
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Total debt securities	4,311	4,281	30	2,005	1,982	23
Equity securities	335	332	3	938	826	112
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Total investments	\$ 4,646	\$ 4,613	\$ 33	\$ 2,943	\$ 2,808	\$ 135
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Short-term	\$ 273	\$ 271	\$ 2	\$ 525	\$ 525	\$ -
Long-term	4,373	4,342	31	2,418	2,283	135
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Total investments	\$ 4,646	\$ 4,613	\$ 33	\$ 2,943	\$ 2,808	\$ 135
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Only \$335 million of investments are equities (and some could be temporary liquidity investments). These equity investments presumably include the venture investments on which the \$260 million impairment (above) was recorded.

- (iv) There may be significant non-cash transactions to purchase assets.
- (v) Some items classified as "other assets" or "other liabilities" on the balance sheet could be financing items rather than operating (as we have classified

them). Footnotes indicate that there are some interest rate derivatives that probably are included in “other.”

- (vi) Currency translations can produce a discrepancy. Balance sheet amounts (from which Δ NOA is calculated in Method 1) are translated at beginning and end of year exchange rates whereas cash flow numbers are translated at average rates during the year.

Question B

Up to 2000, most firms reported the tax benefit from the exercise of employee stock options as a financing item (by adding it to cash received from share issues). A few follow Dell's 1999 disclosure, which the Emerging Issues Task Force (EITF) now advises. It is indeed a cash flow benefit from operations (a tax deduction for implicit wages expense). But the corresponding wages expense is not recorded in the income statement and the implicit cash wage (the difference between market price and exercise price) is not recorded in the operations section of the cash flow statement. Rather it is netted out in the financing section.

At a tax rate of 35%, the implicit wage expense for a \$444 million tax benefit is \$1,268.6 million!

Question C

The number in the shareholders' equity statement includes the tax benefit from issuing shares to employees. (The tax benefit is treated as proceeds from share issues.) But the cash flow statement includes the tax benefit of \$444 million in cash from operations

rather than part of the share issue. GAAP is confused on this issue, treating the tax benefit as a financing flow in the equity statement but as an operational flow in the cash flow statement.

The \$444 million does not explain the full difference between the two numbers. So there must be receivables for the stock issues: employees have been issued the stock but have not yet paid for them.

Question D

Some quality questions arise:

- (i) The tax benefit of employee stock plans is added to cash from operations without the corresponding expense. The tax benefit from operations is included in the cash flow statement but not the income statement. The corresponding employment expense is also missing from the income statement.
- (ii) The disclosure of financing income is inadequate. Is there substantial financing income netted against operating expenses? If so, operating income is not clearly identified.
- (iii) Are there receivables for share issues?