Cash flow is a Fact. Net income is just an opinion*

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Abstract

We use three different definitions of cash flow: equity cash flow (ECF), free cash flow (FCF) and capital cash flow (CCF). We also answer to the question: When net income is equal to the equity cash flow? When making projections, dividends and other payments to shareholders forecasted must be exactly equal to expected equity cash flows.

May a company have positive net income and negative cash flows? Of course: one has only to think of the many companies that file for voluntary reorganization after having a positive net income. This is precisely what happens to the company AlphaCommerce that we show as an example.

A company's net income is a quite arbitrary figure obtained after assuming certain accounting hypotheses regarding expenses and revenues (.one of several that can be obtained, depending on the criteria applied). However, the *ex-post* cash flow is an objective measure, a single figure that is not subject to any personal criterion.

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1. Net income is just an opinion, but cash flow is a fact

There is a financial and accounting maxim which, although it is not absolutely true, comes very close to it and which it is a good idea to remember: "Net income is just an opinion, but cash flow is a fact".

Still today, many analysts view net income as the key and only truly valid parameter for describing how a company is doing. According to this simple approach, if the net income increases, the company is doing better; if the net income falls, the company is doing worse. It is commonly said that a company that showed a higher net income last year "generated more wealth" for its shareholders than another company with a lower net income. Also, following the same logic, a company that has a positive net income "creates value" and a company that has losses "destroys value". Well, all these statements can be wrong.

Other analysts "refine" net income and calculate the so-called **"accounting cash flow"**, adding depreciation to the net income[1]. They then make the same remarks as in the previous paragraph but referring to "cash flow" instead of net income. Of course, these statements too may be wrong.

The classic definition of net income (revenues for a period less the expenses that enabled these revenues to be obtained during that period), in spite of its conceptual simplicity, is based on a series of premises that seek to identify which expenses were necessary to obtain these revenues. This is not always a simple task and often implies accepting a number of assumptions. Issues such as the scheduling of expense accruals, the treatment of depreciation, calculating the product's cost, allowances for bad debts, etc., seek to identify in the best possible manner the quantity of resources that it was necessary to sacrifice in order to obtain the revenues. Although this "indicator", once we have accepted the premises used, can give us adequate information about how a company is doing, the figure obtained for the net income is often used without full knowledge of these hypotheses, which often leads to confusion.

Another possibility is to use an **objective measure**, which is not subject to any individual criterion. This is the difference between cash inflows and cash outflows, called cash flow in the strict sense: the money that has come into the company less the money that has gone out of it. Two definitions of cash flow in the strict sense are used: **equity cash flow** and **free cash flow**. Also, the so-called **capital cash flow** is used. Generally speaking, it can be said that a company is doing better and "generates wealth" for its shareholders when the

[1] The sum of net income plus depreciation is often called *"cash generated by operations"* or *"cash flow earnings"* (see Anthony and Reece (1983), page 343). Net Income is also called Profit after Tax (PAT).

cash flows improve. In the following section, we will take a closer look at the definitions of these cash flows.

2. Accounting cash flow, equity cash flow, free cash flow and capital cash flow

Although the financial press often gives the following definition for accounting cash flow:

accounting cash flow = Profit after Tax (PAT) + depreciation

We will use three different definitions of cash flow: equity cash flow (ECF), free cash flow (FCF) and capital cash flow (CCF).

Equity cash flow (ECF) is the money that remains available in the company after tax, after having covered capital investment requirements and the increase in working capital requirements (WCR), after having paid financial expenses, after having repaid the debt's principal, and after having received new debt.

The ECF represents the cash available in the company for its shareholders, which shall be used for dividends or share repurchases. The equity cash flow in a period is simply the difference between cash inflows[2] and cash outflows[3] in that period.

equity cash flow = cash inflows - cash outflows in a period

When making forecasts, the forecast equity cash flow[4] in a period must be equal to forecast dividends plus share repurchases in that period.

Free cash flow (FCF) is the cash flow generated by operations after tax, without taking into account the company's debt level, that is, without subtracting the company's interest expenses. It is, therefore, the cash that remains available in the company after having covered capital investment requirements and working capital requirements[5], assuming that there is no debt[6].

The FCF is the company's **ECF** assuming that it has no debt.

Free cash flow = equity cash flow if the company has no debt

[2] Cash inflows normally consist of sums collected from customers and the increases in financial debt.

[3] Cash outflows normally consist of payments to employees, suppliers, creditors, taxes... and interest payments and repayment of financial debt.

[4] Equity cash flow is also called equity free cash flow, equity cash flow and levered cash flow.

[5] Some authors call it noncash working capital investments. See, for example, Damodaran (2001, page 133)

It is often said that the FCF represents the cash generated by the company for the providers of funds, that is, shareholders and debtholders[7]. This is not true, the parameter that represents the cash generated by the company for its shareholders and debtholders is the *capital cash flow*.

Capital cash flow (CCF) is the cash flow available for debtholders plus the equity cash flow. The cash flow for debtholders consists of the sum of the interest payments plus repayment of the principal (or less the increase in the principal).

Capital cash flow = equity cash flow + debt cash flow

3. Calculating the cash flows

Equity cash flow (ECF) corresponds to the concept of cash flow. The ECF in a period is the difference between all cash inflows and all cash outflows in that period. Consequently, the ECF is calculated as follows:

Profit after Tax (PAT)
+ Depreciation and amortization
- Increase in WCR (Working Capital Requirements)
- Principal payments of financial debt
+ Increase in financial debt
- Increase in other assets
- Gross investment in fixed assets
+ Book value of disposals and sold fixed assets
ECF (equity cash flow)

The ECF in a period is the increase in cash (above the minimum cash, whose increase is included in the increase in WCR) during that period, before dividend payments, share repurchases and capital increases.

The **free cash flow** (FCF) is equal to the hypothetical equity cash flow that the company would have had if it had no debt on the liabilities side of its balance sheet. Consequently, in order to calculate the FCF from the net income, the following operations must be performed:

[6] Free cash flow is also called cash flow to the firm, free cash flow to the firm and unlevered cash flow.

Profit after Tax (PAT)
+ Depreciation and amortization
- Increase in WCR (Working Capital Requirements)
- Increase in other assets
- Gross investment in fixed assets
+ Interest (1-T)
+ Book value of disposals and sold fixed assets
FCF (free cash flow)

Taking into account the above two calculations, it can be seen that, in the case of perpetuity, the relationship between ECF and FCF is the following:

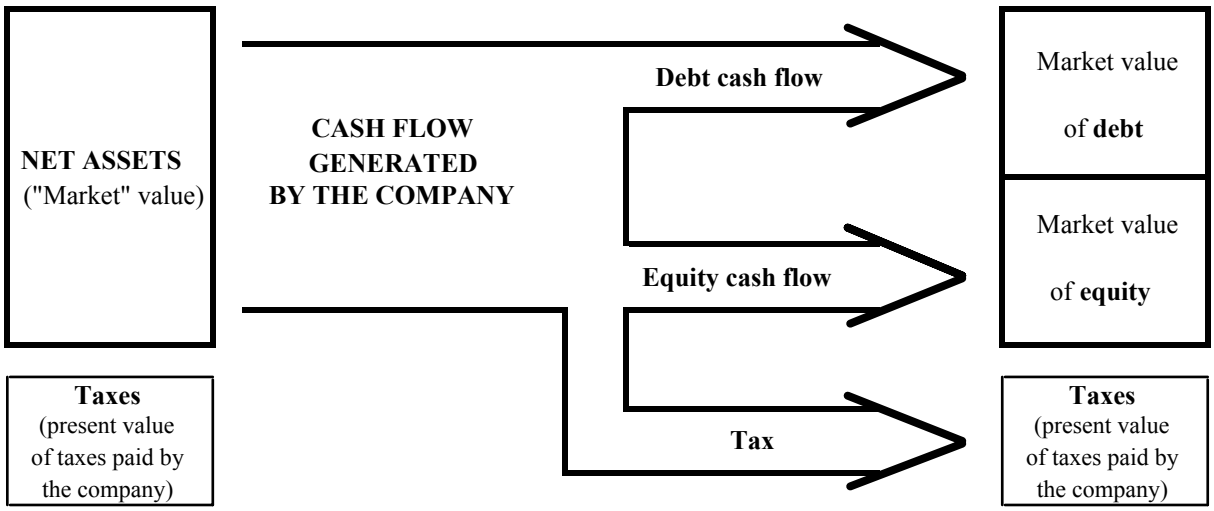
$$\mathbf{FCF = ECF + I\,(1\text{-}T) - \Delta D}$$

If the company has no debt in its liabilities, ECF and FCF are the same.

The **capital cash flow** (CCF) is the cash flow available for all debt and equity holders. It is the equity cash flow (ECF) plus the cash flow corresponding to the debtholders (CFd), which is equal to the interest received by the debt (I) less the increase in the debt's principal (ΔD).

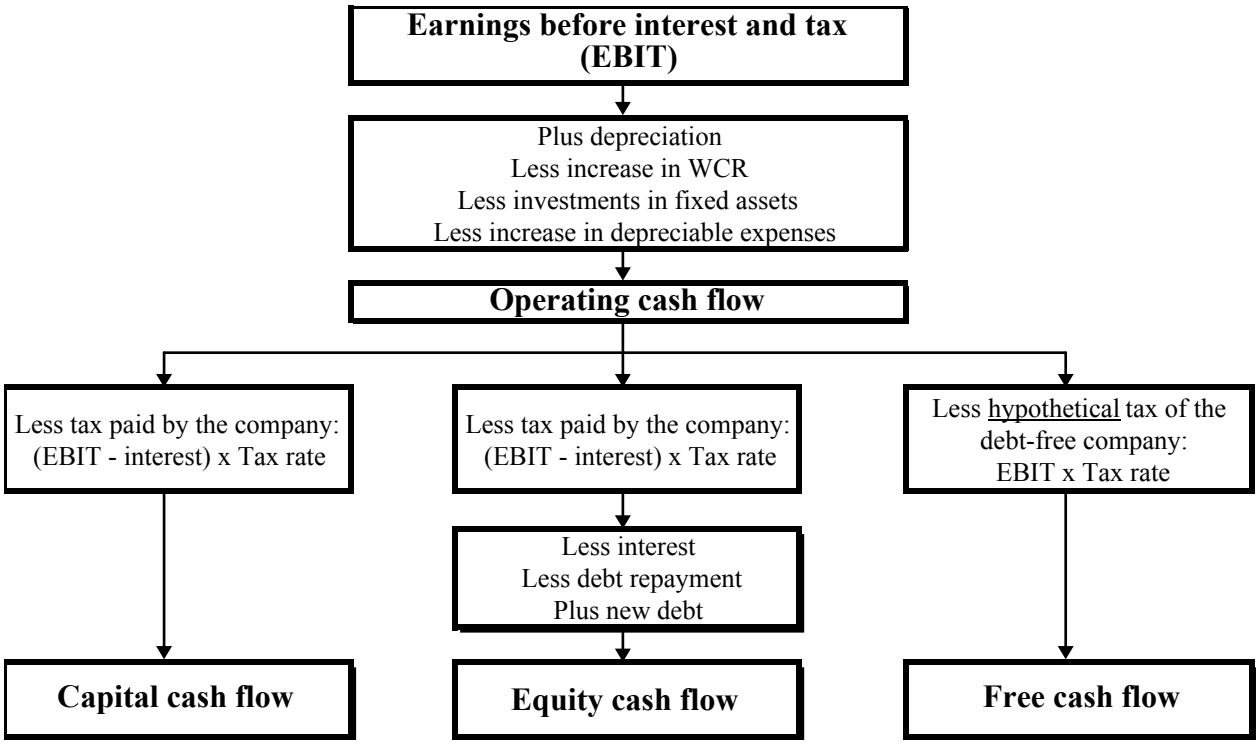
$$\mathbf{CCF = ECF + CFd = ECF + I - \Delta D} \qquad \textbf{where I=DKd}$$

The diagram below summarizes the company valuation approaches using discounted cash flows.



[7] See, for example, Damodaran (1994, page 144) and Copeland, Koller, and Murrin (2000, page 132).

Another diagram that enables us to see the difference between the different cash flows is the following[8]:



May a company have positive net income and negative cash flows? Of course: one has only to think of the many companies that file for voluntary reorganization after having a positive net income. This is precisely what happens to the company we show in the following example.

4. A company with positive net income and negative cash flows

To give a better idea, we give an example in the 4 tables below. Table 1 shows the income statements for a company with strong growth in sales and also in net income. Table 2 shows the company's balance sheets. We assume that the minimum cash is zero. Table 3 shows that, even though the company generates a growing net income, the free cash flow is negative, and becomes increasingly negative with each year that passes. The equity cash flow is also negative. Table 4 is another way of explaining why the free cash flow is negative: because the cash inflows from operations were less than the cash outflows. Finally, Table 5 provides a few ratios and some additional information.

[8] For a company without extraordinary net income or asset disposals.

Table 1. AlphaCommerce. Income Statements

Income Statements (million dollars)	1996	1997	1998	1999	2000
Sales	2,237	2,694	3,562	4,630	6,019
Cost of sales	1,578	1,861	2,490	3,236	4,207
Personnel expenses	424	511	679	882	1.146
Depreciation	25	28	39	34	37
Other expenses	132	161	220	285	370
Interest	62	73	81	96	117
Extraordinary profit (disposal of fixed assets)		-15	32		
Taxes (30%)	4	13	25	29	42
Profit after tax	**12**	**32**	**60**	**68**	**100**

1997: assets with a book value of 15 were written off (gross fixed assets = 25; accumulated depreciation = 10).
1998: at the end of the year, assets with a book value of 28 (gross fixed assets = 40; accumulated depreciation =12) were sold for 60.

Table 2. AlphaCommerce. Balance Sheets

Balance Sheets (million dollars)	1996	1997	1998	1999	2000
Cash and temporary investments	32	28	26	25	25
Accounts receivable	281	329	439	570	742
Inventories	371	429	583	744	968
Gross fixed assets (original cost)	307	335	342	375	410
Accumulated depreciation	50	68	95	129	166
Net fixed assets	257	267	247	246	244
Total assets	**941**	**1,053**	**1,295**	**1,585**	**1,979**

Banks. Short-term debt	402	462	547	697	867
Taxes payable	2	6	12	14	21
Other expenses payable	22	26	36	47	61
Accounts payable	190	212	303	372	485
Long-term debt	95	85	75	65	55
Shareholders' equity	230	262	322	390	490
Total liabilities and shareholders' equity	**941**	**1,053**	**1,295**	**1,585**	**1,979**

Table 3. AlphaCommerce. Free cash flow, equity cash flow, debt cash flow and capital cash flow

Cash flow (million dollars)	1997	1998	1999	2000
Profit after tax	**32**	**60**	**68**	**100**
+ depreciation	28	39	34	37
- purchase of fixed assets	53	47	33	35
+ book value of sold assets	15	28		
- increase of WCR	76	157	210	262
+ interest x (1 - 30%)	51	57	67	82
Free cash flow	**-3**	**-20**	**-74**	**-78**
- interest x (1 - 30%)	51	57	67	82
+ increase of short-term financial debt	60	85	150	170
- principal payments of long-term financial debt	10	10	10	10
Equity cash flow	**-4**	**-2**	**-1**	**0**
Interest	73	81	96	117
+ principal payments of long-term financial debt	10	10	10	10
- increase of short-term financial debt	60	85	150	170
Debt cash flow	**23**	**6**	**-44**	**-43**
Capital cash flow	**19**	**4**	**-45**	**-43**

Table 4. AlphaCommerce. Cash inflows and cash outflows
New funding. (million dollars)

Cash inflows and cash outflows	**1997**	**1998**	**1999**	**2000**
Cash inflows: collections from clients	**2.646**	**3.452**	**4.499**	**5.847**
Cash outflows:				
Payments to suppliers	1,897	2,553	3,328	4,318
Labor	511	679	882	1,146
Other expenses	157	210	274	356
Interest payments	73	81	96	117
Tax	9	19	27	35
Capital expenditures	53	47	33	35
Total cash outflows	**2,700**	**3,589**	**4,640**	**6,007**
cash inflows - cash outflows	**-54**	**-137**	**-141**	**-160**
Financing:				
Increase of short-term debt	60	85	150	170
Reduction of cash	4	2	1	0
Sale of fixed assets	0	60		
Payments of long-term debt	-10	-10	-10	-10
Source of funds	**54**	**137**	**141**	**160**

Table 5. AlphaCommerce. Ratios

RATIOS	**1996**	**1997**	**1998**	**1999**	**2000**
Net income/sales	0.5%	1.2%	1.7%	1.5%	1.7%
Net income/net worth (mean)	5.4%	13.0%	20.5%	19.1%	22.7%
Debt ratio	68.4%	67.9%	66.3%	66.6%	65.8%
Days of debtors (collection period)	45.8	44.6	45.0	45.0	45.0
Days of suppliers (payment period)	40.3	40.3	41.8	40.0	40.0
Days of stock	85.8	84.1	85.5	84.0	84.0
Cash ratio	5.2%	4.0%	2.9%	2.2%	1.7%
Sales growth	27.9%	20.4%	32.2%	30%	30%

5. When is profit after tax a cash flow?

Using the formula that relates **Profit after tax** with the equity cash flow, we can deduce that the Profit after Tax (PAT) is the same as the equity cash flow when the addends of the following equality, which have different signs, cancel out.

Equity cash flow =
Profit after Tax (PAT)
+ depreciation
- gross investment in fixed assets
- increase in WCR (Working Capital Requirements)
- decrease in financial debt
+ increase in financial debt
- increase in other assets
+ book value of fixed assets sold

A particularly interesting case in which this happens is when the company is not growing (and therefore its customer, stock and supplier accounts remain constant), buys fixed

assets for an amount identical to depreciation, keeps debt constant and only writes off or sells fully depreciated assets. Another case is that of a company which collects from its customers in cash, pays in cash to its suppliers, holds no stocks (these three conditions can be summarized as this company's working capital requirements being zero), and buys fixed assets for an amount identical to depreciation.

6. When is the accounting cash flow a cash flow?

Following the reasoning of the previous section, the accounting cash flow is equal to the equity cash flow in the case of a company that is not growing (and keeps its customer, stock and supplier accounts constant), keeps debt constant, only writes off or sells fully depreciated assets, and does not buy fixed assets. Also in the case of a company that collects from its customers in cash, pays in cash to its suppliers, holds no stock (this company's working capital requirements are zero), and does not buy fixed assets.

Is cash flow more useful than net income? This question cannot be answered if we have not defined beforehand who is the recipient of this information and what it is sought to find out by analyzing the information. Also, both parameters come from the same accounting statements. But, as a general rule, yes: the reported net income is one among several that can be given (one opinion among many), while the equity cash flow or free cash flow is a fact: a single figure.

7. Equity cash flow and dividends

We have already said that when making projections, the equity cash flow must be equal to the forecast dividends[9]. When making projections, the forecast dividends must be exactly equal to the equity cash flow. Otherwise, we will be making hypotheses about what use is given to the part of the equity cash flow that is not to be used for dividends (cash, investments, repaying debt...) and it will be necessary to subtract it beforehand from the equity cash flow.

Distributing dividends in the form of shares is not stated as a cash flow because it isn't. The shareholder that receives new shares has more shares with a lower value, but the same total value.

[9] When we say dividends, we are referring to payments to shareholders, which may be dividends, share repurchases, par value repayments…

Table 6. Forecast income statements for Molledo & Co. (thousand dollars)

Year	**2002**	**2003**	**2004**	**2005**
Sales	110,275	170,367	170,367	192,288
Cost of sales	75,417	116,456	116,456	137,810
Personnel expenses	10,735	10,950	10,950	11,169
Depreciation	4,141	4,381	4,381	4,478
Other expenses	9,532	6,872	6,872	6,885
Interest	1,920	2,356	2,356	2,356
Profit before tax (PBT)	8,530	29,352	29,352	29,590
Tax	2,730	9,686	9,686	10,356
Profit after tax (PAT)	**5,801**	**19,666**	**19,666**	**19,233**
Dividends	**0**	**18,388**	**19,666**	**8,817**
To reserves	5,801	1,278	0	10,417

Table 7. Forecast balance sheets for Molledo & Co. (thousand dollars)

Assets	**2001**	**2002**	**2003**	**2004**	**2005**
Cash and temporary investments	1,000	1,103	1,704	1,704	1,923
Accounts receivable		18,788	21,471	21,471	24,234
Inventories	6,300	14,729	14,729	14,729	16,335
Gross fixed assets	56,700	56,700	62,700	67,081	72,081
Accumulated depreciation	0	4,141	8,522	12,903	17,381
Net fixed assets	56,700	52,559	54,178	54,178	54,700
Total assets	**64,000**	**87,179**	**92,082**	**92,082**	**97,191**

Liabilities	**2001**	**2002**	**2003**	**2004**	**2005**
Accounts payable		9,195	10,502	10,502	12,244
Taxes payable		910	3,229	3,229	3,452
Medium-term financial debt	0	7,273	7,273	7,273	0
Long-term financial debt	32,000	32,000	32,000	32,000	32,000
Shareholders' equity	32,000	37,801	39,078	39,078	49,495
Total liabilities	**64,000**	**87,179**	**92,082**	**92,082**	**97,191**

Let us see an example. Tables 6 and 7 contain the forecast income statements and balance sheets for the company Molledo & Co, which plans to start operating at the end of 2001. The initial investment is 64 million dollars, which is funded in equal proportions with long-term debt and equity. The company does not plan to distribute dividends in 2002 so as to reduce its medium-term funding requirements for funding its working capital requirements.

Table 8 shows the company's different cash flows. It can be seen that the equity cash flow is equal to the forecast dividends.

It also enables another statement made in section 5 to be verified. As in the year 2004, the company:

a) Does not grow (the income statement is identical to 2003);

b) Keeps its working capital requirements constant;

c) Keeps its financial debt constant; and

d) Buys fixed assets for an amount identical to depreciation, the net income forecast for 2004 is identical to the forecast equity cash flow (and the forecast dividends).

Table 8. Forecast cash flows for Molledo & Co. (thousand dollars)

Year	**2001**	**2002**	**2003**	**2004**	**2005**
Net income (PAT)	0	5,801	19,666	19,666	19,233
+ depreciation	0	4,141	4,381	4,381	4,478
- Increase in WCR	7,300	17,214	-341	0	2,622
- Increase in fixed assets	56,700	0	6,000	4,381	5,000
+ Increase in short-term financial debt	0	7,273	0	0	-7,273
+ Increase in long-term financial debt	32,000	0	0	0	0
Equity cash flow	**-32,000**	**0**	**18,388**	**19,666**	**8,817**
- Increase in short-term financial debt	0	7,273	0	0	-7,273
- Increase in long-term financial debt	32,000	0	0	0	0
+ Interest (1-T)	0	1,248	1,532	1,532	1,532
Free cash flow	**-64,000**	**-6,025**	**19,920**	**21,197**	**17,621**
Accounting cash flow	0	9,942	24,047	24,047	23,711
Debt cash flow	**-32,000**	**-5,353**	**2,356**	**2,356**	**9,629**
Capital cash flow	**-64,000**	**-5,353**	**20,744**	**22,022**	**18,446**
Dividends		**0**	**18,388**	**19,666**	**8,817**

8. Recurrent cash flows

Sometimes, people talk about recurrent equity cash flow and recurrent free cash flow. These cash flows are calculated in the same manner as the cash flows explained in the chapter with just one difference: only the businesses in which the company was already present at the beginning of the year are considered. Therefore, net income, increases in WCR, increases in depreciable expenses or gross investment in fixed assets arising from acquisitions of companies, new business lines and, in general, investments in businesses that are still incipient, are not included.

9. Attention to the accounting and the managing of net income

When analyzing accounting statements, which are used by most listed companies, it is important to consider the accounting standards the techniques used by the firm. The most important are:

- Recognition of revenues. Some firms recognize revenues too early and others too late: companies have some degrees of freedom to recognize revenues[10].

[10] See, for example, the HBS case The O. M. Scott & Sons Company.

- Capitalizing expenses. Companies may make payments that do not appear in the income statement but are entered directly as an increase in assets (capitalized). For example, oil companies capitalize exploration costs[11]; electric utilities capitalize interest expense…
- Use of accrual and reserves. Firms may build up accruals and reserves for court settlements, consumer's demands, bad debts, and other potential losses and expected payments. However, many firms build up excess accruals and reserves in good years to use this excess in bad years. By doing that, companies smooth-out net income.
- Extraordinary profits from investments. Many firms hold in their balance sheets marketable securities valued below their market values and sell these investments in bad years to smooth-out net income.
- In many countries outside the US it is quite easy for some companies to charge some payments against retained earnings, without going through the profit and loss statements. This is the case of the staff reduction costs due to early retirement incurred by the Spanish banks. The table below shows the charges to retained earnings for early retirement costs incurred by the main Spanish banks:

Million euros	1996	1997	1998	1999	2000e	Total
BBVA	0	225	395	384	666	1,670
BSCH	250	56	210	802	480	1,798
Popular	60	72	102	106	0	340

When analyzing international consolidated accounting statements, which are used by most listed companies, it is important to take into account the consolidation method used. Readers interested in a more detailed discussion of this subject are recommended to read chapter 25 of the book *Contabilidad para dirección* written by my colleagues at IESE's control department, headed by professor Pereira. There are three ways of consolidating the purchase of another company's shares:

- Passive consolidation. The shares purchased are entered in the assets at purchase cost, the dividends received are entered as financial income, and the proceeds of the sale of the shares are entered as extraordinary income. In addition, a provision must be made for future losses, including potential losses. In order to calculate the provisions, the reference taken must be the share's price on the stock market.

[11] See, for example, the HBS case Gulf Oil Corp.-Takeover.

- Equity method. Recommended for holdings between 20%-50% in unlisted companies and 3%-5% in listed companies. The shares purchased are entered in the assets at purchase cost (distributed between the shares' book value and goodwill); the corresponding percentage of the net income appears in the income statement (the balancing entry in the investment); the dividends received are entered as a decrease in the investment; and the proceeds of the sale of the shares are entered as extraordinary income. The goodwill generated in the purchase (difference between the shares' purchase value and book value) is depreciated over 20 years.
- Overall consolidation. In this case, the income statements and the balance sheets are added together, eliminating the accounting operations that start and end within the group. If the company is not fully-owned, the percentage of the net income corresponding to outside partners is deducted in the income statement. On the liabilities side, the quantity of shareholders' equity corresponding to outside partners, also called minority holdings, is also indicated.

It is important to adequately analyze consolidation in order to correctly calculate the cash flows generated by the company. To calculate the cash flows in the case of overall consolidation, each company must be analyzed separately.

An excellent book on the analysis of financial statements is Penman, Stephen H. (2001), *Financial Statement Analysis and Security Valuation,* McGraw-Hill. Chapters 7 to 12 provide a very useful guide for interpreting balance sheets and income statements.

Summary

A company's Profit after Tax (or Net Income) is a quite arbitrary figure obtained after assuming certain accounting hypotheses regarding expenses and revenues. On the other hand, the cash flow is an objective measure, a single figure that is not subject to any personal criterion.

In general, to study a company's situation, it is more useful to operate with the cash flow (ECF, FCF or CCF) as it is a single figure, while the net income is one of several that can be obtained, depending on the criteria applied.

Profit after Tax (PAT) is equal to the equity cash flow when the company is not growing (and keeps its customer, inventory and supplier accounts constant), buys fixed assets

for an amount identical to depreciation, keeps debt constant, and only writes off or sells fully depreciated assets.

Profit after Tax (PAT) is also equal to the equity cash flow when the company collects in cash, pays in cash, holds no stock (this company's working capital requirements are zero), and buys fixed assets for an amount identical to depreciation.

The accounting cash flow is equal to the equity cash flow in the case of a company that is not growing (and keeps its customer, inventory and supplier accounts constant), keeps debt constant, only writes off or sells fully depreciated assets and does not buy fixed assets.

When making projections, dividends and other payments to shareholders forecasted must be exactly equal to expected equity cash flows.

REFERENCES

Anthony, R. N. and J. S. Reece (1983), *Accounting: Text and Cases*, Irwin.

Copeland, T. E., T. Koller, and J. Murrin (2000), *Valuation: Measuring and Managing the Value of Companies,* Third edition. New York: Wiley.

Damodaran, Aswath (1994), *Damodaran on Valuation*, John Wiley and Sons, New York.

Damodaran, Aswath (2001), *The Dark Side of Valuation*, Prentice-Hall, New York.

Fernandez, Pablo (2002). *Valuation Methods and Shareholder Value Creation,* Academic Press, San Diego, CA.

Pereira, F., E. Ballarín, M. J. Grandes, J. M. Rosanas and J. C. Vazquez-Dodero (2000), *Contabilidad para dirección*, 17th edition, Eunsa.

Penman, Stephen H. (2001), *Financial Statement Analysis and Security Valuation,* McGraw-Hill

Unknown author, "Gulf Oil Corp.-Takeover", Harvard Business School case N. 9-285-053

Unknown author, "The O. M. Scott & Sons Company", Harvard Business School case N. 9-209-102.