



The cash flow statement: implications for the use of the direct or the indirect method

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Abstract

Purpose – To describe a user-oriented, pedagogical approach that integrates the statement of cash flows throughout the financial accounting course. It also reviews the major regulatory requirements on cash flow reporting amended by IAS No. 7.

Design/methodology/approach – The essence of this approach is the use of an expanded accounting equation with temporary cash accounts corresponding to major categories on the statement of cash flows.

Findings – Provides information about the use of cash flows. Recognises that the timing of statement of cash flows coverage in accounting courses is unfortunate for two reasons. First, the statement of cash flows is an important topic that all business students need to understand. Second, most students learn cash flows at the beginning of their financial accounting class, so there is no reason to defer coverage in this topic.

Practical implications – This paper provides a useful source of information for undergraduate and graduate students to understand and evaluate the links between cash flow statement and other financial statements.

Originality/value – This paper fulfils a gap in educational research by helping students to develop their skills and their critical view on the theory and usefulness of the cash flow statement.

Keywords Cash flow, Financial reporting, Accounting

Paper type Research paper

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A. Rai, "Reconciliation of net income to cash flow from operations: an accounting equation approach", *Journal of Accounting Education*, Volume 21 pp. 17-24 (2003) (<http://www.ingentaconnect.com/content/els/07485751/2003/00000021/00000001/art00032>)

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1. Introduction

Economic science and historical experience teach that the fluctuations of share prices in the market cannot easily be predicted, specifically in the short-term. Investors' accurate and timely informing is the best way to confront investment risks. It is up to investors to make information provided productive.

The cash flow statement displays analytically the sources (cash inflows) and the uses (cash outflows) of company's cash in a fiscal year. Specifically, it provides detailed information for the origin of a company's cash (net profits of use, increases of capital stock) and their disposal (payment of taxes, dividends, investments etc.). Investors should evaluate extensively the purposes for which a company's capital is spent, particularly if cash comes from increases of stock capital, so as to realize if the funds raised were used in a productive manner, and in accordance with the company's investment needs reported in the relevant prospectus.

The statement of cash flows requires that cash receipts and payments are classified into cash from operating, investing and financing activities. Information about investing and financing activities that did not result in cash receipts or payments has to be provided separately. Companies are encouraged to report cash flows from operating activities using the direct method. If the indirect method is used, the company is required to show the same Euro amount of operating cash receipts and payments under both methods. This is done indirectly by removing from net income amount the effect of all cash flows from operating activities.

The statement of cash flows is a compulsory financial statement, which provides information about a company's cash inflows and outflows over a period of time. This information helps predicting a company's future cash flows and thus facilitates investment and credit decisions to be made. The financial results reported in the cash flow statements are considered to be superior to the estimates taken from income statement and balance sheet. Moreover, the cash flow statement helps investigating firm characteristics that contribute to variations in the relation between cash flow and credit risk (Billings and Morton, 2002) helping thus firms to take economically correct corporate decisions.

Financial Accounting Standards Board Statement No.95 (SFAS No.95) permits the reporting of cash flows from operating activities using either the direct method or the indirect method.

The US standard on reporting cash flows pre-dated AASB 1026 (statement of cash flows) by some years. Statement of Financial Accounting Standards No.95, statement of cash flows, was issued by the FASB in November 1987 and was set effective for fiscal years ending after 15 July 1987. FASB 95 required a statement of cash flows to be one of the three financial statements by all business enterprises.

In terms of interpreting a cash flow statement, several textbooks have adopted a user – oriented approach by omitting most of the recording process and focusing on an accounting equation analysis (Sullivan and Benke, 1997). The user – oriented approach should provide students with an understanding of how accounting events affect the income statement, the balance sheet and the statement of cash flows. Further, better understanding of the relation between cash flows and cash balances encourage students' interests in learning. Crab (1999) used cash flow methodology in order to teach students how to plan their personal finance and mentions that many personal finance problems involve cash flow analysis.

Bahnson *et al.* (1996) show that in addition to the potential learning problems that may result from the derivation approach to determine cash flows this important

financial statement often receives less coverage in comparison to the income statement and to the balance sheet. They recommend that accounting systems should be redesigned in order to directly capture cash flows, and that accounting educators rethink their pedagogical approach to the statement of cash flows.

Although many existing textbooks provide numbers of examples and explain how to prepare cash flows from operating activities using the indirect method, they do not emphasize on the analytical framework that connects changes in the balance sheet and the income statement to the statement of cash flows.

This article provides an analytical framework that explains cash flows from operating activities using the guidance of the primary principles of the basic accounting equation. Thus, this study provides some mathematical proofs concerning the importance and potential benefits of cash flows as it relates to changes in the cash balance. This approach, which is particularly insightful, can improve intermediate level accounting courses and financial statement analysis courses that cover the statement of cash flows in great detail.

The rest of the paper is organized as follows: Section 2 provides the institutional framework for the Hellenic capital market commission amended for cash flow reporting in Greece; Section 3 provides the cash flow statement from operating activities according to IAS 7, Section 4 provides the analytical model of the paper; and Section 5 concludes the paper. Finally, a numerical application is demonstrated in the Appendix.

2. The institutional framework for cash flow reporting in Greece

Every corporation is obliged by the company law (L. 2190/20) to publish annual financial statements. Given the importance of periodical informing of investors and in compliance with the relative European legislation, all listed companies are compelled to publish information for their economic activities in shorter time intervals. Particularly, the publication of quarterly, semi-annual and annual financial statements is anticipated.

Interim financial statements have to be audited by a chartered accountant. The financial statements help investors to find out the financial position, as well as the evolution of basic financial accounts of each company from period to period. The choice is then for investors to decide whether to place their capital in shares of companies that present healthy financial structure, high liquidity and attractive productivity (profitability), in relation to the subject and the sector in which they operate.

The intuition is that it should be made easy for investors to separate operating from financial results (profits or loss) of the company so as to emphasize on the progress of its operational results rather than in the change of total pre-taxes results. The operating results of a company relate exclusively to the production and the disposal of products or services that compose the main activity of the company. The non-operating results concerns transactions that do not have any relation with the main activity of the company and usually have exceptional, precarious or coincidental character, as for example, the probable financial profit or loss that results from transactions on bonds, shares or dividends of mutual funds, foreign exchange differences or sales of consolidated assets. Investors should examine carefully the evolution of companies' turnover and operational results over time and compare them with those of other companies in the same activity.

By the end of the year 2003, the Hellenic capital market commission, in an attempt to enforce corporate governance, and to strengthen transparency and direct and non-stumbling informing of the investors, established regulations requiring, listed companies to publish timely information, which refers to their basic course. In addition, listed companies are obliged to publish the annual bulletin and the cash flow statement, the latter being included in the former.

Apart from the cash flow statement, the annual bulletin also includes annual (balance sheet, operating profit and loss, account statement, distribution of profits statement) and periodical (quarterly) financial statements in consolidated and non-consolidated base, relative consolidates reports of company's auditors and relevant statements of uses of raised funds from potential increases of capital. Moreover, it includes the evolution of the share price and the volume of transactions of the company's shares, in relation to the evolution of the respective sector index and to the composite-share index of the Athens stock exchange. The annual bulletin should be available in the company's annual general assembly of shareholders, as well as in the company's web page, if this exists.

Interim financial statements (quarterly, semi-annual, nine-month) provide concisely the same information with the annual financial statement, although they refer to shorter time periods (Negakis, 1992). It is noticed that the Greek legislation is stricter than that of the EU, which only imposes the publication of annual and semi-annual financial statements. In this way, investors can be informed about the progress of listed companies' financial position per quarter, and compare the quarterly results (first quarter, semi-annual, nine-month, year) with each other and with the respective results of the previous year.

3. Cash flow statement from operating activities

Every listed company is obliged to publish its financial reports including cash flow statements using either the direct or the indirect method.

Under the direct method, major classes of gross cash receipts and gross cash payments are disclosed.

The direct method of cash flows provides indications that can be used in predicting future cash flows. On the other hand, the indirect method cannot provide information which may be useful in estimating future cash flows.

The required information about the major classes of gross cash receipts and gross cash payments may be acquired either:

- (1) From the accounting reports of the listed company.
- (2) By adjusting the items of the income statement account to reveal:
 - Periodic changes in inventories and operating receivable and payables.
 - Other non-cash items, such as depreciation, deferred taxes, gain or losses from unrealized (gains and losses) undistributed profits, minority interests and provisions.
 - Other items that can be classified as either investing or financing.

Using the indirect method of cash flows net profit or loss is adjusted for the effects of transactions of a non-cash nature, any deferrals or accruals of past or future operating cash receipts or payments and items of income or expense associated with investing or financing cash flows

If this seems to be the case, then the net cash flow, from operating activities is specified by accommodating to the net profit or loss accounts the effects of:

- changes in inventories and operating receivables and payables that occurred during the period;
- non-cash items; and
- other items that can be classified as either investing or financing.

Additionally, the net cash flow from operating activities using the indirect method can be displayed by showing the sources (revenues) and the uses (expenses) in the income statement and the changes in the period examined (IAS 7).

3.1 Direct method

In mathematical terms, the cash flow statement using the direct method can be expressed as a set of equations as follows:

Cash flow from operations (CFO) is the algebraic difference between cash inflows (CI) and cash outflows (CO):

$$\text{CFO} = \text{CI} - \text{CO} \quad (1)$$

In equation (1) cash inflows (CI) is defined as cash receipts from customers and cash outflows (CO) as cash paid to suppliers and employees. Moreover, net cash flow from operations (NCFO) is CFO minus income taxes paid (TP) and interests paid (IP) for the year. Algebraically:

$$\text{NCFO} = (\text{CFO}) - \text{TP} - \text{IP} \quad (2)$$

Cash flow from investing activities (CFI) is defined as:

$$\text{CFI} = (\text{DI} + \text{SA}) - (\text{II} + \text{PA}) \quad (3)$$

where DI is decrease in investments, SA is sale of assets, II is increase in investments and PA is purchase of assets.

Cash flow from financing activities (CFF) is given as follows:

$$\text{CFF} = \text{NIC} + \text{NDI} + \text{BL} + \text{DIV} \quad (4)$$

where NIC denotes new common stock issued, NDI is new debt issued, BL is new bank loans raised and DIV is payment of dividends.

3.2 Indirect method

For the sake of simplicity cash flow from operations, using the indirect method, are defined as follows in mathematical terms.

Cash flow from operations using the indirect method simply transforms net income (NI) from an accruals basis to a cash basis by doing the following adjustments:

$$\text{CFO} = \text{NI} + \text{DEP} - \Delta\text{AR} - \Delta\text{INV} + \Delta\text{AP} \quad (5)$$

where NI is net income before extraordinary items and discontinued operations, DEP is depreciation, ΔAR is the change in accounts receivable, ΔINV is the change in inventories

and ΔAP is the change in accounts payable. If from CFO taxes paid (TP) and interests paid (IP) are deducted we end up with net cash flow from operations (NCFO) as in (II).

Cash flow from investing activities (CFI) and cash flows from financing activities are defined as in direct method.

4. Using the basic accounting equation for cash flow statement

4.1. Development of a model

To begin with the development of a model, we investigate the relation between the change in the cash balance and the cash flows from operating activities using the basic accounting equation.

Operating activities are defined as all the transactions of a firm that occur from its normal operation in producing and selling its products or services and do not involve investing or financing activities. Cash receipts from interest bearing securities or stocks and interest and tax expenditures are included in NCFO.

The well-known basic accounting equation has the following form:

$$\text{Assets} = \text{equity} + \text{liabilities} \quad (6)$$

Equation (6) is a simple yet powerful relationship. Equation (6) is used as the starting point to develop a model that explains cash flows from operating activities.

To develop the model, the following notations are used:

C = Cash

eAR = Accounts receivables

INV = Inventory

FA = Fixed assets

DEP = Depreciation

SFA = Assets sold at book value

NFA = New fixed assets bought

AP = Accounts payable

BL = Bank loans

TP = Taxes payable

IP = Interests paid

NCL = Non-current liabilities

NCA = Non-current assets

NDI = New debt issued

SC = Share capital

Sec = Securities bought

NIC = New common stock issued

NI = Net income

DIV = Dividends

RE = Retained earnings

CFO = Cash flow from operating activities

CFI = Cash flow from investing activities
 CFF = Cash flow from financing activity
 NCFO = Net cash flow from operating activity
 CA = Current assets
 CL = Current liabilities.

The aim is to demonstrate how the change in the cash balance, reported in the balance sheet emerges using the basic accounting equation. What is more that the change in the cash balance prevails as a result of cash flow from different types of activities and in particular from operating activities, investing activities and financing activities.

The analysis that follows assumes a simple scenario about a firm that reports under IFRS (2005). Current assets consist of cash (C), accounts receivables (AR), securities (Sec) and inventory (INV). Non-current assets consist solely of depreciable fixed assets (FA), which are reported net of accumulated depreciation (DEP). The balance of net fixed assets varies because some new fixed assets are acquired throughout the period (NFA) and because some fixed assets are sold at their book value. Current liabilities consist of accounts payable (AP) and bank loans (BL). Non-current liabilities (NCL) include old debt and new debt issued at par (NDI). It is also assumed that no debt is retired throughout the period. Share capital (SC) consists of common stock and new common stock may be issued (NIC). The firm has a normal retained earnings (RE) balance at the beginning of the period. Net income of the period (NI) does not include any special items, extra-ordinary items, or effects of discontinued operations and of changes in accounting principles. The firm may distribute part of its earnings as dividends (DIV) during the period. Retained earnings plus dividends sum up to the net income of the period.

We begin by restating equation (7):

$$\text{Assets} = \text{Equity} + \text{Liabilities} \quad (7)$$

Each term of equation (1) can be decomposed into its components as follows

$$\text{CA} + \text{NCA} = (\text{SC} + \text{RE}) + (\text{CL} + \text{NCL}) \quad (8)$$

Next, the terms in both sides of equation (8) are broken into their sub-components. Substituting and re-arranging terms yields the following relationship:

$$\begin{aligned} &[(\text{C} + \text{AR} + \text{INV} + \text{Sec}) + (\text{FA})] \\ &= [(\text{AP} + \text{BL}) + (\text{NCL})] + (\text{SC} + \text{RE}) \end{aligned} \quad (9)$$

Equation (9) holds at any point of time within a period, including both the closing date of the period as well as the opening date of the period. Subtracting beginning-of-period equation (9) from end-of-period equation (9) yields on re-arrangement:

$$\begin{aligned} &[(\Delta\text{C} + \Delta\text{AR} + \Delta\text{INV} + \Delta\text{Sec}) + (\Delta\text{FA})] \\ &= [(\Delta\text{AP} + \Delta\text{BL}) + (\Delta\text{NCL})] + (\Delta\text{SC} + \Delta\text{RE}) \end{aligned} \quad (10)$$

where Δ denotes the change in any account between two points in time: the end and the beginning of the period (closing balance–opening balance).

Solving for ΔC yields an identity for cash flows:

$$\Delta C = [(\Delta AP + \Delta BL) + (\Delta NCL)] \\ + (\Delta SC + \Delta RE) - [(\Delta AR + \Delta INV + \Delta Sec) + (\Delta FA)] \quad (11)$$

Equation (11) highlights the overall purpose of the statement of cash flow and explains the change in the cash balance of the period. Next under the assumption that, ΔNCL , ΔSC , ΔRE , and ΔFA are new debt issued (NDI), new share capital issued (NIC), net income minus dividends and new fixed assets minus sold fixed assets minus depreciation respectively equation (11) transforms as follows:

$$\Delta C = [(\Delta AP + \Delta BL) + NDI] + (NIC + NI - DIV) \\ - (\Delta AR + \Delta INV + \Delta Sec) - (NFA - SFA - DEP) \quad (12)$$

Re-arranging equation (12) gives:

$$\Delta C = (NI + DEP + \Delta AP - \Delta AR - \Delta INV) \\ + (SFA - NFA - \Delta Sec) + (NDI + NIC + \Delta BL - DIV) \quad (13)$$

Deductively it can be seen that, the basic accounting equation described in equation (13), which can be analyzed into its sub-components, i.e. current and non-current assets, current and non-current liabilities, share capital and retained earnings described in equation (8), can be written as in equation (13), stated in a differential form, and the basic equation can be seen in terms of cash flow activities as:

$$\Delta C = CFO + CFI + CFF \quad (14)$$

where

$$CFO = NI + DEP + \Delta AP - \Delta AR - \Delta INV$$

$$CFI = SFA - NFA - \Delta Sec$$

$$CFF = NDI + NIC + \Delta BL - DIV$$

The model analytically provides important aspects of cash flow from operations and clearly shows how a non-cash charge like depreciation is added to net income and how an increase in accounts receivables is deducted. More interestingly, this model highlights that all the information required, emerges from the basic accounting equation.

Thus it has the intuitive appeal that it does not rely on any simplifying assumptions as other cash flow models do. For example, in management accounting classes students are taught that cash flows can be obtained by assuming a comprehensive or clean surplus income concept (Kousenidis *et al.*, 1998) which requires that all changes in the balance sheet flow through the profit and loss account – clean surplus. The model developed here does not require any assumptions to be made. On the other hand, however, it helps students to understand how changes in the balance sheet relate to the income from operations.

Finally, this method clearly demonstrates how the components of a change in the balance of the fixed assets account appears in different classifications of cash flow and why an item of accounts payable (dividends payable) is included in the financing activities section, rather than in the operating activities section like most of the accounts payable.

Moreover, if taxes paid and interests paid are subtracted from CFO we end up with Net CFO. Algebraically:

$$\text{NCFO} = (\text{CFO}) - \text{TP} - \text{IP} \quad (15)$$

5. Concluding remarks

This paper provides a framework, which can be employed to introduce the indirect method of cash flow from operations. Moreover, it demonstrates the articulation of the financial statements, and the statement of cash flows.

We explained how the change in the cash balance of a firm could be displayed in the terms of cash flow from operating activities based on the basic accounting equation. This is demonstrated in the numerical example that follows in the Appendix. The results seem to be accurate and according to the model presented above.

Students may clearly see the usefulness of the operating cash flow statement. Further, students can understand the relation of cash flow from operating activities and the change of cash balance. They can see the application of the theory presented by the cash flow, developing their skills and their critical view.

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Further reading

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Appendix

The numerical example above follows the 2005 IFRS model balance sheet.

The following information refers to OMEGA Company:

- (1) The net income after extraordinary items and discontinued operations for the year was €51,000.
- (2) Taxes paid for the year was €10,000.
- (3) The company issued additional common stock of €30,000.
- (4) The depreciation expense for the year was €10,000.
- (5) The company bought new equipment for €120,000 and sold old equipment for €60,000. The book value of the equipment sold was €60,000.
- (6) The company issued new long-term debt for €65,000.
- (7) The company declared dividends of €50,000.
- (8) Interest paid for the year was €12,000b.

OMEGA corp's balance sheets on 1 January 200X and 31 December 200X are provided in Table AI.

Using the information contained in the balance sheet, equation (11) of the text is stated as follows:

Assets	31 December 200X	1 January 200X	Liabilities and equity	31 December 2000X	1 January 200X
Non-current assets (in thousands of €):			Non-current liabilities (in thousands of €):		
Property, plant and equipment	660	600	Bank loans	591	531
Investment property	5	12	Convertible loan notes	35	34
Goodwill	4	12	Deferred tax liabilities	50	40
Deferred tax assets	5	17	Obligations under finance leases	20	10
Derivative finance instruments	3	10	Provisions	40	68
Total non-current assets	677	651	Total non-current liabilities	736	683
Current assets (in thousands of €):			Current liabilities (in thousands of €):		
Cash and equivalents	450	400	Trade and other payables	503	465
Trade and other receivables	420	370	Current tax liabilities	45	63
Inventory	180	175	Interest payable	45	61
Securities	45	40	Bank overdrafts and loans	50	19
Total current assets	1095	985	Total current liabilities	643	608
			equity:		
			Common stock	270	240
			Retained earnings	123	105
			Total owners' equity	393	345
Total assets	1772	1636	Total liabilities and equity	1772	1636

Table AI.
OMEGA company,
balance sheet (all
numbers in thousands
of Euro)

$$\Delta C = [(\Delta AP + \Delta BBL) + \Delta NCL] + (\Delta SC + \Delta RE) \\ - [(\Delta AR + \Delta INV + \Delta Sec) + \Delta FA]$$

Substituting the respective amounts from the balance sheet of OMEGA Ltd, yields

$$(450 - 400) = [(503 - 465) + (50 - 19)] + [(736 - 683)] + [(270 - 240) \\ + (123 - 105)] - [(420 - 370) + (180 - 175) + (45 - 40)] \\ + [(660 - 600)] \\ \text{or } 50 = [(38 + 31) + (53)] + (30 + 18) - [(50 + 5 + 5) + (60)], \text{ and} \\ 50 = (69) + (53) + (48) - (120) = 50$$

The fact that the above relationship is a variant of the basic accounting equation can be emphasized to students. The information about net income and other activities that affect cash is reflected in the following equation:

$$\Delta C = (NI + DEP + \Delta AP - \Delta AR - \Delta INV) \\ + (SFA - NFA - \Delta Sec) \\ + (NDI + NIC + \Delta BBL - DIV)$$

or equivalently in numerical terms:

$$(450 - 400) = [51 + 10 + (503 - 465) - (420 - 370) \\ - (180 - 175)] + (60 - 120 - 5) \\ + [60 + 30 + (50 - 19) - 50] \\ \text{or } 50 = (51 + 10 + 38 - 50 - 5) - (65) \\ + (60 + 30 + 31 - 50) \\ = [44] - [65] + [71] = 50$$

As it can be seen the sum of the terms in the first parenthesis are the CFO. Last NCFO is calculated as follows:

$$NCFO = NI + DEP + \Delta AP - \Delta AR - TP - IP$$

Substituting gives:

$$NCFO = 51 + 10 + 38 - 50 - 5 - 10 - 12 = 22.$$

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