Working Capital Management

Theory and Strategy

Robert Alan Hill

bookboon
The eBook company

Robert Alan Hill

Working Capital Management

Theory and Strategy

Working Capital Management: Theory and Strategy
1st edition

ISBN 978-87-403-0380-3

Contents

About the Author

With an eclectic record of University teaching, research, publication, consultancy and curricula development, underpinned by running a successful business, Alan has been a member of national academic validation bodies and held senior external examinerships and lectureships at both undergraduate and postgraduate level in the UK and abroad.

With increasing demand for global e-learning, his attention is now focussed on the free provision of a financial textbook series, underpinned by a critique of contemporary capital market theory in volatile markets, published by bookboon.com.

To contact Alan, please visit Robert Alan Hill at www.linkedin.com.

1 An Overview

1.1 Introduction

Throughout all the previous texts in my bookboon series (referenced at the end of this Chapter) we have defined Strategic Financial Management in terms of two inter-related policies:

> The determination of a *maximum* net cash inflow from investment opportunities at an acceptable level of risk, underpinned by the acquisition of funds required to support this activity at *minimum* cost.

You will also recall that if management employ capital budgeting techniques, which *maximise* the expected net present value (NPV) of all a company's investment projects, these inter-related policies should conform to the *normative* objective of business finance, namely, the *maximisation of shareholders wealth*.

Having dealt comprehensively with the fundamentals of capital budgeting and *fixed asset* formation elsewhere in the "Strategic Financial Management" texts of the bookboon series, the purpose of this study is to focus on *current asset* investment and the *strategic* importance of working capital management. Not only do current assets comprise more than 50 per cent of many firms' total asset structure, but their financing is also an integral part of project appraisal that is frequently overlooked.

Comprehensive, yet concise, all the material is presented logically as a guide to further study, using the time- honoured approach adopted throughout my bookboon series.

> Each Chapter begins with *theory*, followed by its *application* and an appropriate *critique*. From Chapter to Chapter, *summaries* are presented to reinforce the major points. Each Chapter also contains *Activities* (with indicative solutions) to test understanding at *your own pace*.

On completing the text, you are invited to complement this study with its successor in the author's bookboon Business series, "Strategic Debtor Management and Terms of Sale" (2013). This deals with the pivotal role of credit terms as a determinant of efficient working capital management. Alternatively, you can download the comprehensive text "Working Capital and Strategic Debtor Management" (2013) and read Chapter Six onwards. Either way, the material in all the studies is easily cross referenced, since they adopt the same numbering for the sequence of Equations throughout all the Chapters.

1.2 Objectives of the Text

This book assumes that you have *prior knowledge* of Financial Accounting and an ability to interpret corporate financial statements using ratio analysis. So, at the outset, you should be familiar with the following *glossary* of terms:

Working capital: a company's surplus of current assets over current liabilities, which measures the extent to which it can finance any increase in turnover from other fund sources.

Current assets: items held by a company with the objective of converting them into cash within the near future. The most important items are debtors or account receivable balances (money due from customers), inventory (stocks of raw materials, work in progress and finished goods) and cash or near cash (such as short term loans and tax reserve certificates).

Current liabilities: short term sources of finance, which are liable to fluctuation, such as trade creditors (accounts payable) from suppliers, bank overdrafts and tax payable.

On completion of the text you should be able to:

- Distinguish between the *internal* working capital management function and an *external* interpretation of a firm's working capital position, revealed by its published accounts using ratio analysis.
- Calculate the working capital *operating* cycle and *financing* cycle from published accounting data and analyse the inter-relationships between the two,
- Define the dynamics of a company's *credit-related* funds system,
- Appreciate the disparities between the theory and practice of working capital management, given our normative wealth maximisation assumption.

1.3 Outline of the Text

We shall begin by explaining the relationship between working capital management and financial strategy. You are reminded that the normative objective of financial management is the maximisation of the expected net present value (NPV) of all a company's investment projects. Because working capital is an integral part of project appraisal, we shall define it within this context.

We then reveal why the traditional accounting concept of working capital is of limited use to the financial manager. The long-standing rule that a firm should strive to maintain a 2:1 ratio of current assets to current liabilities is questioned. Using illustrative examples and Activities you will be able to confirm that:

- Efficient working capital management should be guided by *cash* profitability, which may conflict with *accounting* definitions of solvency and liquidity developed by external users of published financial statements,
- An optimal working capital structure may depart from accounting conventions by reflecting a balance of credit-related cash flows, which are unique to a particular company.

So, when a firm decides to sell on credit, or revise credit policy variables, it should ensure that the incremental benefits from any additional investment exceed the marginal costs.

Review Activity

Because it is a theme that we shall develop throughout the text, using your previous knowledge of published company financial statements:

Briefly explain the overall limitations of a Balance Sheet as a basis for analysing the data it contains.

Balance Sheets only show a company's position on a certain date. Moreover, each represents a "snapshot" that is also several months old by the time it is published. For these reasons, they are a record of the past, which should not be regarded as a reliable guide to current activity, let alone the future. For this we need to turn to stock market analysis, press and media comment.

Moreover, a Balance Sheet does not even provide a true picture of the past. It shows historically, how much money was spent (equity, debt and reserves) but not whether it has been spent wisely.

Fixed assets recorded at "cost" do not give any indication of their current realisable value, nor their future worth in terms of income earning potential.

Working capital data may be equally misleading. Stocks, debtors, cash, creditors, loans and overdrafts may change considerably over a short period.

Finally, a Balance Sheet reveals little about market conditions, the true value of goodwill, brand names, intellectual property, or the quality of management and the workforce.

1.4 Summary and Conclusions

In reality we all understand that firms pursue a variety of objectives, which widen the *neo-classical profit motive* to embrace different goals and different methods of operation. Some of these dispense with the assumption that firms maximise anything, particularly in overcrowded, small company sectors. Invariably, even where objectives exist, *short term survival* not only takes precedence over profit maximisation but also management's *satisficing* behaviour. And in such circumstances, *mimicking* the sector's working capital structure may be all that seems feasible.

Similarly, in the case of oligopolistic sectors, much larger firms may feel the need (or are forced) to react to the policy changes of major players. But here fear, rather than desperation, may be the incentive to adhere to over-arching working capital profiles and industry terms.

As we shall discover, for most firms across the global economy:

- The *traditional* management of working capital based on accounting convention (relative to an *optimum* net investment in inventory, debtors and cash) may be way off target.
- As a consequence, the derivation of anticipated net cash inflows associated with a firm's capital investments, which justifies the deployment of working capital, may fail to maximise shareholder wealth.

1.5 Selected References

Hill, R.A., bookboon.com.

Text Books:

Strategic Financial Management, (*SFM*), 2008.

Strategic Financial Management: Exercises, *(SFME)*, 2009.

Portfolio Theory and Financial Analyses, *(PTFA)*, 2010.

Portfolio Theory and Financial Analyses: Exercises, *(PTFAE)*, 2010.

Corporate Valuation and Takeover, (*CVT*), 2011.

Corporate Valuation and Takeover: Exercises, (*CVTE*), 2012.

Working Capital and Strategic Debtor Management, (*WC&SDM*), 2013.

Working Capital and Strategic Debtor Management: Exercises (*WC&SDME*), 2013.

Business Texts:

Strategic Financial Management: Part I, 2010.

Strategic Financial Management: Part II, 2010.

Portfolio Theory and Investment Analysis, 2010.

The Capital Asset Pricing Model, 2010.

Company Valuation and Share Price, 2012.

Company Valuation and Takeover, 2012.

Strategic Debtor Management and Terms of Sale, 2013.

2 The Objectives and Structure of Working Capital Management

2.1 Introduction

For those familiar with my *bookboon* series, we have consistently defined the normative objective of financial management as the determination of a *maximum* inflow of project cash flows commensurate with an acceptable level of risk. We have also assumed that the funds required to support acceptable investment opportunities should be acquired at *minimum* cost. You will recall that in combination, these two policies conform to the normative objective of business finance, namely, *shareholders wealth maximisation.*

As we first observed in Chapter Two (Section 2.1) of "Strategic Financial Management" (2008) and "Strategic Financial Management: Part 1" (2010), any analyses of investment decisions can also be conveniently subdivided into two categories: long-term (strategic) and short-term (operational).

The former might be unique, irreversible, invariably involve significant financial outlay but uncertain future gains. Without sophisticated forecasts of periodic cash outflows and returns, using capital budgeting techniques that incorporate the time value of money and a formal treatment of risk, the financial penalty for error can be severe.

Conversely, operational decisions tend to be divisible, repetitious and may be reversible. Within the context of capital investment they are the province of *working capital management*, which lubricates a project once it is accepted.

You should also remember, from your accounting studies (confirmed by the previous Chapter) that from an *external* user's perspective of periodic published financial statements:

> Working capital is conventionally defined as a firm's current assets minus current liabilities on the date that a Balance Sheet is drawn up.
>
> Respectively, current assets and current liabilities are assumed to represent those assets that are soon to be converted into cash and those liabilities that are soon to be repaid within the next financial period (usually a year).

From an *internal* financial management stance, however, these definitions are too simplistic.

> Working capital represents a firm's *net investment* in current assets required to support its *day to day* activities.
>
> Working capital arises because of the disparities between the cash inflows and cash outflows created by the supply and demand for the physical inputs and outputs of the firm.

For example, a company will usually pay for productive inputs before it receives cash from the subsequent sale of output. Similarly, a company is likely to hold stocks of inventory input and output to solve any problems of erratic supply and unanticipated demand.

For the technical purpose of investment appraisal, management therefore incorporate initial working capital into NPV project analysis as a cash *outflow* in year zero. It is then adjusted in subsequent years for the *net* investment required to finance inventory, debtors and precautionary cash balances, less creditors, caused by the acceptance of a project. At the end of the project's life, funds still tied up in working capital are released for use, elsewhere in the business. This amount is treated as a cash *inflow* in the last year, or thereafter, when available.

The net effect of these adjustments is to charge the project with the interest foregone, i.e. the *opportunity cost* of the funds that were invested throughout its entire life. All of which is a significant departure from the *conventional* interpretation of published accounts by *external* users, based on the *accrual* concepts of Financial Accounting and generally accepted accounting principles (*GAPP*) which we shall explore later (and which you should be familiar with).

> **Activity 1**
>
> If you are unsure about the treatment of a project's working capital using discounted cash flow (DCF) analyses, you should read the following chapters from my bookboon series:
>
> (a) Chapter Two (Section 2.1) "Strategic Financial Management" (*SFM 2008*).
> (b) Chapter Three "Strategic Financial Management: Exercises" (*SFME 2009*) and work through the Review Activity.

2.2 The Objectives of Working Capital Management

The internal management of working capital can be distinguished from the capital budgeting decision that it underpins by:

(a) The Production Cycle

Unlike fixed asset investment, the working capital planning horizon, which defines the cyclical conversion of raw material inventory to the eventual receipt of cash from its sale, can be measured in months rather than years. Working capital can also be increased by smaller physical and monetary units. Such divisibility has the advantage that average investment in current assets can be minimised, thereby reducing its associated costs and risk.

(b) The Financing Cycle

Because the finance supporting working capital input (its conversion to output and the receipt of cash) can also be measured in months, management's funding of inventory, debtors and precautionary cash balances is equally flexible. Unlike fixed asset formation, where financial prudence dictates the use of long-term finance wherever possible, working capital cycles may be supported by the long and short ends of the capital market. Finance can also be acquired piecemeal. Consequently, greater scope exists for the minimisation of capital costs associated with current asset investments.

Despite the disparity between capital budgeting and working capital time horizons, it is important to realise that the two functions should never conflict. Remember that the unifying objective of financial management is the maximisation of shareholders wealth, evidenced by an increase in corporate share price. This follows logically from a combination of:

- *Investment* decisions, which identify and select investment opportunities that *maximise* anticipated net cash inflows in NPV terms,
- *Finance* decisions, which earmark potential funds sources required to sustain investments, evaluate the return expected by each and select the optimum mix which *minimises* their overall capital cost.

The relationships between investment and financing decisions are summarised in Figure 2.1.

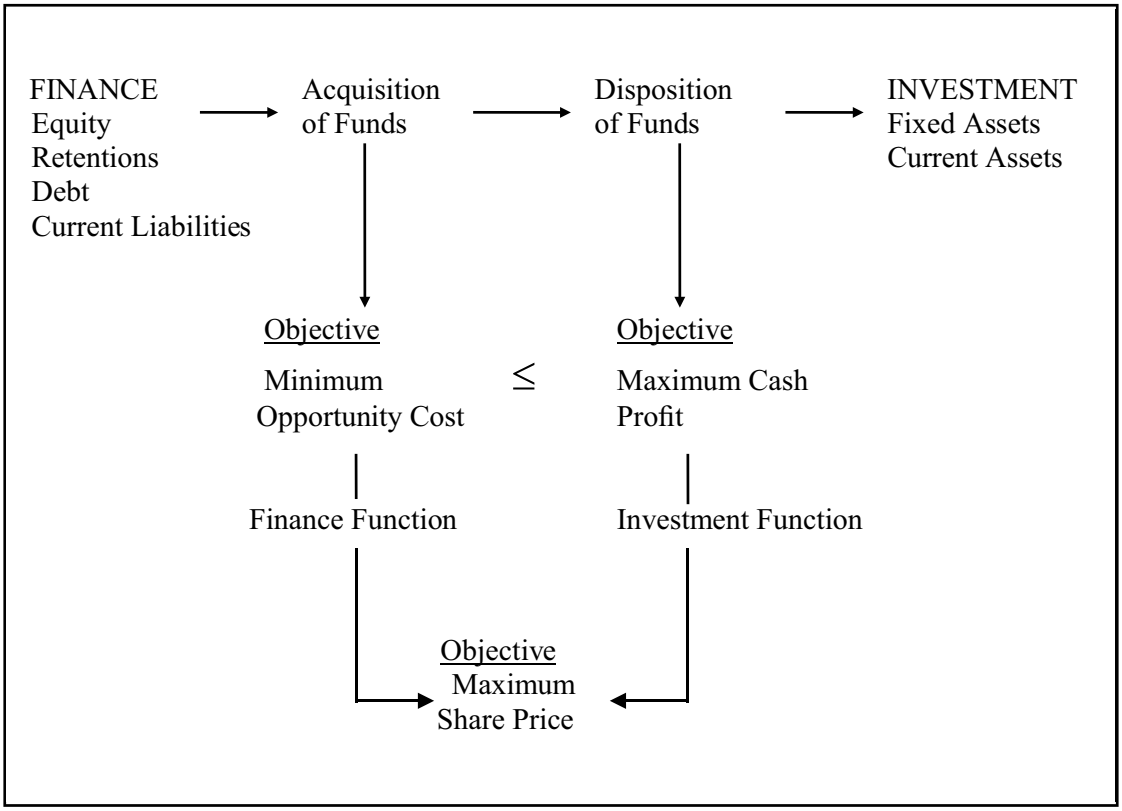

Figure 2.1: Corporate Financial Objectives

The diagram reveals that a company wishing to maximise its market price per share would not wish to employ funds unless their *marginal* yield at least matched the rate of return its investors can earn elsewhere. The *efficient* management of current assets and current liabilities within this framework, therefore, poses two fundamental problems for financial management:

- Given sales and cost considerations, a firm's *optimum* investments in inventory, debtors and cash balances must be specified.
- Given these amounts, a *least-cost* combination of finance must be obtained.

2.3 The Structure of Working Capital

Ultimately, the purpose of working capital management is to ensure that the operational cash transactions to support the demand for a firm's products and services actually take place. These define a firm's working capital *structure* at any point in time, which is summarised in Figure 2.2 below. We shall refer to aspects of this diagram several times throughout the text, but for the moment, it is important to note the three *square* boxes and two *dotted* arrows.

- The cash balance at the centre represents the total amount available on any particular day.
- This will be depleted by purchases of inventory, plus employee remuneration and overheads, which are required to support production.
- The receipt of money from sales to customers will replenish it.
- A cash deficit will require borrowing facilities.
- Any cash surplus can be reinvested, placed on deposit or withdrawn from the business.

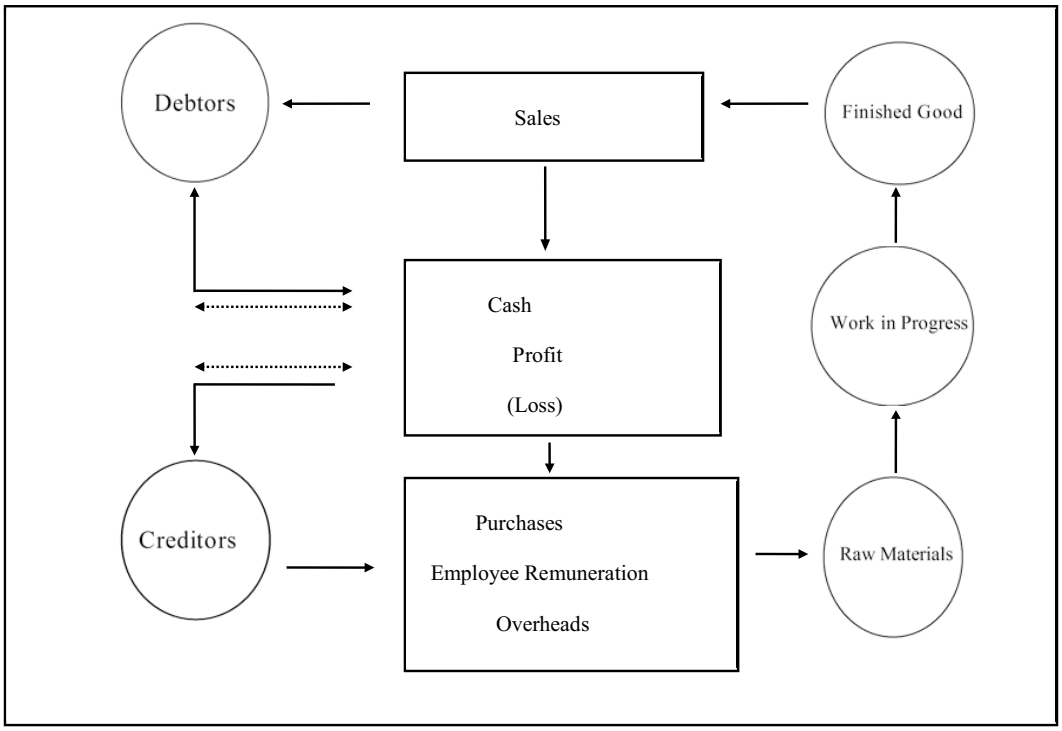

Figure 2.2: The Structure and Flow of Working Capital

If the cycle of events that defines the conversion of raw materials to cash was instantaneous, there would never be a cash surplus (or deficit) providing the value of sales matched their operational outlays, plus any allowances for capital expenditure, interest paid, taxation and dividends. For most firms, however, this cycle is interrupted as shown by the *circles* in the diagram.

On the *demand* side, we can identify two factors that affect cash transactions adversely. Unless the firm requires cash on delivery (COD) or operates on a cash and carry basis, customers who do not pay immediately represent a claim to cash from sales, which have already taken place. These define the level of debtors outstanding at a particular point in time. Similarly, stock purchases that are not sold immediately represent a claim to cash from sales, which have yet to occur. For wholesale, retail and service organisations these represent finished goods. For a manufacturing company there will also be raw materials and items of inventory at various stages of production, which define work in progress.

On the *supply* side, these interruptions to cash flow may be offset by delaying payment for stocks already committed to the productive process. This is represented by creditors. The net effect on any particular day may be a cash surplus, deficit or zero balance.

- *Surpluses* may be invested or distributed, *deficits* will require financing and *zero* balances may require supplementing.

Thus, we can conclude that a firm's working capital structure is defined by its forecast of overall cash requirements, which relate to:

- Debtor management
- Methods of inventory (stock) control
- Availability of trade credit
- Working capital finance
- Re-investment of short-term cash surpluses.

In fact, if you open any management accounting text on the subject you will find that it invariably begins with the preparation of a cash budget. This forecasts a firm's appetite for cash concerning the period under review, so that action can be planned to deal with all eventualities. The conventional role of the financial manager is then to minimise cash holdings consistent with the firm's needs, since idle cash is unprofitable cash.

You will recall from your accounting studies that the cash budget is an amalgamation of information from a variety of sources. It reveals the expected cash flows relating to the operating budget, (sales minus purchases and expenses), the capital budget, interest, tax and dividends. Long or short term, the motivation for holding cash is threefold.

- The *transaction* motive ensures sufficient cash to meet known liabilities as they fall due.
- The *precautionary* motive, based on a managerial assessment of the likelihood of uncertain events occurring.
- The *speculative* motive, which identifies opportunities to utilise cash temporarily in excess of requirements.

Given sales and cost considerations, the minimum cash balances required to support production are therefore identified. Within the context of working capital these depend upon the control of stocks, debtors and creditors, plus opportunities for reinvestment and borrowing requirements.

Review Activity

Again using your knowledge from previous *accounting* studies, it would be useful prior to Chapter Three if you could:

a) Define a company's working capital and its *minimum* working capital position.
b) Explain how *external* users of published accounts interpret the working capital data contained in corporate annual statements using *conventional* ratio analysis based on *solvency* and *liquidity* criteria.

We shall then use this material as a basis for further discussion.

2.4 Summary and Conclusions

Having surveyed the management of working capital management and the pivotal role of cash budgeting, we have observed that most textbooks covering the subject then proceed to analyse its component parts individually. Invariably they begin with inventory (stock) control decisions, before moving on to debtors, creditors and short-term finance, including the reinvestment of cash surpluses. Your conclusion might well be that "real world" working capital management is also divisible and therefore less problematical than any other finance function.

On both counts this is a delusion. For the purposes of simplicity, illustrations of working capital and investments in current assets and liabilities throughout the literature tend to regard market conditions, demand and hence sales and cost considerations as *given*. Unfortunately, this is tantamount to trading within a closed environment, oblivious to the outside world. Yet, we all know that business is a *dynamic* process, susceptible to change, which is forged by a continual search for new external investment opportunities. So, there is no point in companies holding more cash and inventory, or borrowing, if the aim is not to increase sales. And even then, the only reason to increase sales is to enhance cash profitability through new investment.

Thus, the key to understanding the structure and efficient management of working capital does not begin with a cash budget followed up by inventory control and a sequential analysis of other working capital items. On the contrary, like all other managerial functions, it should be *prefaced* by an appreciation of how the demand for a company's goods and services designed to maximise corporate wealth is created in the first place. And as we shall discover in future Chapters, from a working capital perspective, the strategic contributory factor relates to debtor policy, namely:

> How the *terms of sale* offered by a company to its customers can influence demand and increase turnover to produce maximum profit at minimum cost.

2.5 Selected References

1. Hill, R.A., bookboon.com.

Strategic Financial Management, (*SFM*), 2008.

Strategic Financial Management: Part 1, 2010.

Strategic Financial Management: Exercises *(SFME)*, 2009.

3 The Accounting Concept of Working Capital: A Critique

3.1 Introduction

We concluded Chapter Two by observing that the key to understanding efficient working capital management requires an appreciation of how a company's terms of sale can increase the demand for its products and services to produce maximum profit at minimum cost. Before developing this theme throughout the remainder of the text, the purpose of this Chapter is to reveal in greater detail why:

> The traditional accounting definition and presentation of working capital in published financial statements and its conventional interpretation by external users of accounts reveals little about a company's "true" financial position, or managerial policy.

If proof were needed, I suspect one of the first things that you learnt from your accounting studies and rehearsed in the answer to the first part of the previous Chapter's Review Activity is that using Balance Sheet analysis:

> The conventional concept of working capital is defined as an *excess* of current assets over current liabilities revealed by financial reports. It represents the *net* investment from longer-term fund sources (debt, equity or reserves) required to finance the day to day operations of a company.

This definition is based on the traditional accounting notions of *financial prudence* and *conservatism*. Because current liabilities must be repaid in the near future, they should not be applied to long term investment. So, they are assumed to finance current assets.

Yet we all know that in reality (rightly or wrongly) new issues of equity or loan stock and retentions are often used by management to finance working capital. Likewise, current liabilities, notably permanent overdraft facilities and additional bank borrowing may support fixed asset formation.

None of this is revealed by an annual Balance Sheet, which is merely a *static* description and classification of the acquisition and disposition of long and short term funds at one point in time, prepared for stewardship and fiscal purposes, based on generally accepted accounting principles (GAPP).

Not only do Balance Sheets fail to identify the *dynamic* application of long and short-term finance to fixed and current asset investment. But because they are *a cost-based* record of *current* financial position, they provide no *external* indication of a firm's *value* or *future plans* (which are the bedrock of *internal* financial management).

3.2 The Accounting Notion of Solvency

For the external user of published accounts interested in assessing a company's working capital position and credit worthiness, you should also have noted in your answer to the first part of Chapter Two's Review Activity that:

> Within the context of traditional financial statement analysis, without access to better information (insider or otherwise) any initial interpretation of a firm's ability to pay its way is determined by the relationship between its current assets and current liabilities.

Analytically, this takes the form of the working capital (current asset) ratio, with which you should be familiar.

$$(1)\quad \text{The Working Capital (Current Asset) Ratio} = \frac{\text{Total current assets}}{\text{Total current liabilities}}$$

> Convention dictates that the higher the current ratio, the easier it should be for a company to meet its short term financial obligations (*i.e.* pay off its current liabilities) which are more susceptible to fluctuation.

Positive working capital is conventionally interpreted as an indicator of financial strength. The ratio should be consistent within the company over time. Moreover, it should stand up against competitors (or the industry average) at any point in time. There is also a textbook consensus (with which you should be familiar) that an upper *2:1 ratio* limit is regarded as financially sound. Otherwise, current asset investment may be wasteful (although if business conditions improve or deteriorate, companies may periodically depart from convention).

Zero working capital defines a company's *minimum* working capital position, calibrated by a 1:1 ratio of current assets to current liabilities.

Moving on to the second part of Chapter Two's Review Activity:

From a traditional accounting perspective, a 1:1 ratio of current assets to current liabilities (zero working capital) defines corporate *solvency*. This arithmetic *minimum* is justified by a fundamental corporate objective, namely *survival*.

To survive, a firm must remain *solvent*. Solvency is a question of fact, since it is maintained as long as current financial obligations can be met. *Insolvency* arises when debts due for payment cannot be discharged.

Activity 1

Using the following data (£000) calculate the current ratios for Sound Garden plc and interpret their solvency implications:

	Year 1	**Year 2**
Current assets:		
Stocks	500	900
Debtors	300	600
Cash	80	280
	880	1,780
Current liabilities:		
Creditors	290	540
Bank Overdraft	-	1,000
	290	1,540

Referring back to Chapter Two (Figure 2.2) you will recall that current assets are continuously transformed into cash as operating cycles run their course, whilst current liabilities represent imminent capital repayments that are assumed to fall due within one year. So, taking either year as the *current* period, the working capital (current) ratio is assumed to reflect solvency (or otherwise) at Sound Garden's annual Balance Sheet publication date.

The corresponding figures in Activity 1 show an ability to meet current liabilities out of current assets, however they are compared. The theoretical *minimum* limit to solvency is a current ratio of 1:1, or net working capital of zero (defined as an excess of current assets to current liabilities).

Assuming the overdraft facility is used to finance increased working capital commitments, (stocks, debtors and precautionary cash balances), the current ratios for each year are:

Year 1	**Year 2**
$\frac{880}{290} = 3:1$	$\frac{1,780}{1,540} = 1.2:1$

So which ratio is preferable?

Conventional accounting analysis dictates that the higher the current ratio, the better Sound Garden plc can meet its impending financial obligations. As we mentioned earlier, the ratio should also be consistent within the company over time, yet stand up against competitors or the industry average at any point in time. There is a textbook consensus that a 2:1 ratio is financially sound, although if business conditions improve or deteriorate, companies may periodically depart from convention.

Thus, without more detailed information, we might conclude that the current ratio for Year 1 is unduly cautious, whilst that for Year 2 indicates possible bankruptcy if trends continue.

But all is still not revealed.

3.3 Liquidity and Accounting Profitability

Whilst solvency is a question of fact, we have also observed that it is also a dynamic *cash flow* concept. As long as a business consistently has greater cash receipts than payments, it should always be able to repay its debts whenever they fall due. Thus, you will appreciate that neither *today's* amount of working capital, nor the current ratio, are sufficient indicators of a company's *future* debt paying ability.

The extent to which the *composition* of a firm's current asset structure comprises cash or legal claims to cash, in the form of debtors and marketable securities, rather than highly un-saleable part-finished inventory or bad debts are also important. If stocks cannot be converted into cash to meet the time scale of payments to creditors, the business must look to its debtors and cash balances to meet its current liabilities, or else borrow still further.

The *liquidity* concept therefore serves as a *complement* to a conventional Balance Sheet analysis of *solvency*. It allows the external observer to assess more accurately the risk of working capital investment formulated by the relationship between a firm's current assets (which now excludes inventory) and its total current liabilities. This metric is defined by:

$$(2)\quad \text{The Liquidity or "Quick" Ratio} = \frac{\text{Total liquid assets}}{\text{Total current liabilities}}$$

where the theoretical lower limit to liquidity is still measured by a ratio of 1:1.

Activity 2

(a) Calculate the liquidity ratios for Year 1 and Year 2 using Sound Garden's data from Activity 1.
(b) How do the results complement your previous interpretation of the data?

With liquidity ratios of 1.3:1 and 0.57:1 respectively, the above Activity would appear to confirm possible bankruptcy for Sound Garden plc, even though total current assets exceed total current liabilities for both years. On the other hand, given the enormous variety and quality of realisable inventory and liquid assets, both within and between industries, let alone individual companies, this may be a gross misinterpretation of the data. Neither investment in working capital, nor liquidity, is an end in itself. Many companies operate extremely successfully with solvency ratios well below 1:1. Conversely, there is a well documented history of companies that have become insolvent whilst publishing accounting profits.

Like other areas of financial management, working capital policies must therefore be judged in terms of the risk associated with the overall returns that firms deliver.

So, returning to first principles, how do external users of accounts (shareholders, creditors and potential investors) gauge a company's overall return from published financial statements, which are prepared by management on their behalf (the *agency* principle)?

3.4 Financial Interpretation: An Overview

Referring again to your Accounting studies, you will recall that the traditional approach to performance evaluation by external users of company accounts takes the form of a *pyramid* of ratios. At the *apex* of this framework stands the *primary* ratio. An overall return that can be measured in a variety of ways, using various definitions of a profit to asset ratio, termed return on capital employed (ROCE).

The view taken here is that a *summary* metric of corporate profitability is best interpreted by a ratio of *net* profit to total *net* assets, which gauges the productivity of *all* the resources that a firm has at its disposal, irrespective of their financing source.

- Net profit (the *numerator*) is defined as earnings before interest and tax (EBIT) after an allowance for the depreciation of fixed assets. We include tax because rates may change over time, which would invalidate any periodic post-tax profit comparisons (*i.e.* we would not be comparing like with like).
- Total net assets (the denominator) represent the sum of fixed assets (including excess and idle assets surplus to requirements, which are a drain on profit) after an allowance for depreciation, plus net current assets (the difference between current assets and current liabilities due for imminent repayment).

This *primary* definition of corporate performance (ROCE) can then be *mathematically* deconstructed into two *secondary* ratios, which highlight the reasons for the firm's overall profitability, namely its *net* profit margin and total *net* asset utilisation (asset turnover), as follows:

$$(3)\quad \text{ROCE} = \frac{\text{Net profit}}{\text{Total net assets}} = \frac{\text{Net Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total net assets}}$$

Activity 3

Explain why a high or low ROCE ratio is determined by a combination of a company's profit margin and asset utilisation.

The first point to note is the mathematical relationship in Equation (3). By multiplying the two secondary ratios together, their respective sales terms disappear to yield the ROCE.

Thus, it follows that the higher the profit, or the lower the assets, for a given level of sales, then the higher the ROCE and *vice versa*.

The *secondary* ratios are further analysed by a series of *tertiary* measures to show how the company is performing. A simple pyramid is summarised in Figure 3.1 below.

If the published ROCE is deemed unsatisfactory by whatever external test, say an average industry return, returns for similar companies, or past returns for the firm in question (historical cost or value based), we can offer two plausible explanations.

- Weak profit margins, due to an inadequate gross profit percentage or excessive overhead expenses, (the *operating* ratios).
- Mediocre sales turnover, due to an inefficient utilisation of fixed assets or current assets.

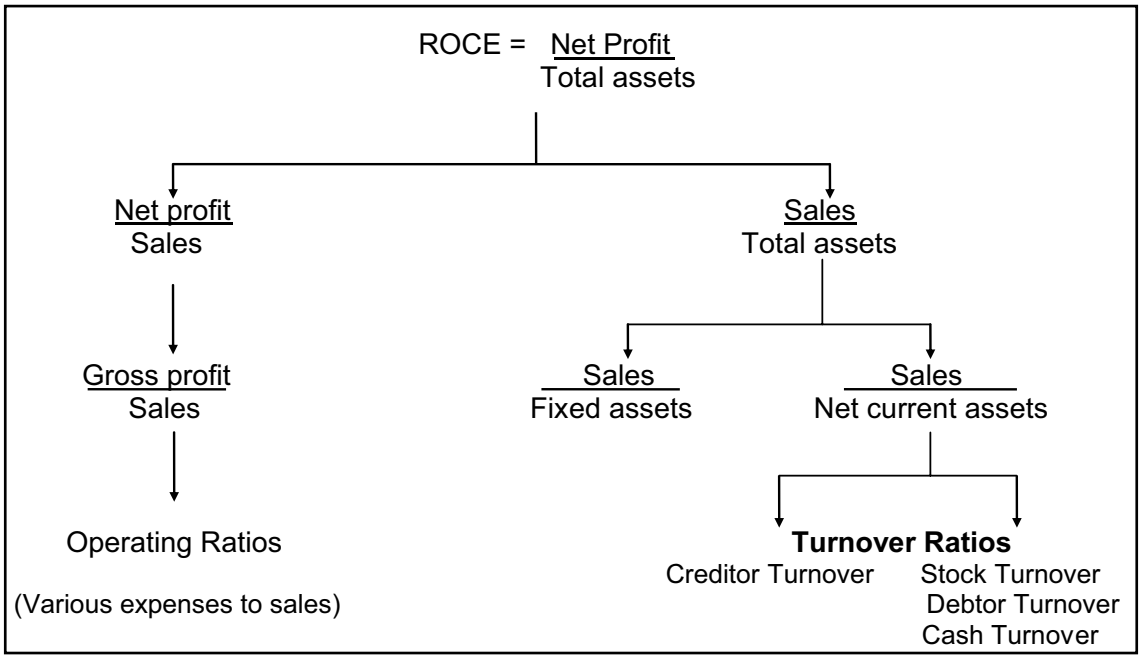

Figure 3.1: Ratio Analysis, Accounting Profitability and Working Capital

As part of a general analysis of corporate profitability, Figure 3.1 highlights that our particular area of study, namely efficient working capital management, is interpreted by a cluster of *turnover* measures subsumed under the sales to net current asset ratio.

Given our initial interest in *solvency*, one of the first questions you might ask is whether it is possible to define the amount of net current assets that a firm ought to hold at any particular time? This is because a high proportion of working capital to total assets may give management greater flexibility:

- To adapt to changing conditions, without compromising its debt paying ability.
- To realise short-term assets (rather than borrow) and reinvest the proceeds in fixed assets or generate more sales.

- To increase sales by a temporary reduction in liquidity.

However, without more detailed analysis of the firm's working capital structure, subsumed under its sales to current asset ratio, we may be jumping to the wrong conclusions. A high proportion of current assets to fixed assets may be inefficient.

The sales to net current asset ratio provides a summary measure of working capital efficiency; the higher the ratio, the higher the sales per unit of net current assets, which should impact favourably upon ROCE.

But again, don't make the mistake of confusing turnover figures with profit. They help to show external users of accounts how a company is performing, but are only part of a bigger picture and therefore need to be treated with caution.

For example, the rate at which goods are sold and cash received from customers, or "turned over" per annum (measured by the ratios of sales to stocks and debtors respectively) is much faster in some sectors than others. Food retailing tends to exhibit a rapid "stock turn" for cash at small profit margins. On the other hand, the nature of the engineering process means that this sector operates at a much slower pace. Considerable capital is locked into production and tied to long term contracts. But set against this, the profit margins tend to be significantly higher.

3.5 Liquidity and Turnover

Before we present a more detailed analysis of the role turnover ratios in Chapter Four, let us set the scene by again focusing on *liquidity* and the definition of a cash balance required by a firm, based on the sales to cash turnover ratio itemised in Table 3.1.

As a guide to further study, our purpose is to reveal the complexity of financial statement analysis and how one ratio may be affected by other aspects of a firm's operations, leading to its misinterpretation.

Since a major corporate motive for holding cash is to support production that generates sales, we can define:

$$(4) \quad \text{Cash Turnover} = \frac{\text{Sales for the period}}{\text{Initial cash balance}}$$

The cash *turnover* ratio is sometimes termed the cash *velocity* ratio. But how do we analyse its movement over time?

Activity 3

a) With sales of \$360m and an initial cash balance of \$18m, calculate the cash turnover (velocity) ratio for Adele plc.
b) What is your interpretation of the company's performance if future sales increase to \$450m the following year, but the initial cash balance remains the same?

a) $$\text{Cash Turnover} = \frac{\text{Sales for the period}}{\text{Initial cash balance}} = \$360\text{m} / \$18\text{m} = 20$$

b) Any measure of corporate performance, such as ROCE and its associated pyramid of ratios, is neither *static* or *absolute* but *dynamic* and *relative*. It must be compared to some standard of comparison over time (similar firms in similar industries, or the firm itself) as economic and geo-political events unfold. With regard to cash velocity, ideally, Adele plc would hope to confirm an improving trend, or at least periodic consistency, using all of these criteria. A sales uplift of \$90m one year to the next, without any change in its cash balance, increases the company's cash turnover from 20 to 25 times. This represents a 25 per cent increase in sales per unit of cash held. But is it good?

In one sense yes: the cash balance is still \$18m, instead of rising to \$450m /20, which equals \$22.5m. So, there is an implied saving of interest on borrowing, or a financial gain by reinvesting the \$4.5m difference at the company's opportunity cost of capital rate. This should improve overall profitability.

Like any *external* analysis of financial ratios, however, the figures also give rise to questions rather than answers, which cannot be interpreted in isolation without access to *internal* (managerial) information.

Two combined worst case scenarios may be that the cash balance is still $18m because creditors have imposed stricter terms of sale and debtors are also taking much longer to pay, imposing an intolerable strain on liquidity. Cash also has a variety of uses, which might not be related to an increase in sales. For example, loans may have been repaid one year to the next. Cash can also appear in the guise of new overdraft facilities that are not recorded in the velocity ratio (or even the Balance Sheet) but still contribute to increased sales.

To second guess *internal* managerial policies (the unknowable) *external* users of accounts can always compare the cash turnover ratio for Adele plc with the average liquidity for the industry. They might also set their own theoretical minimum proportion of cash holdings to sales as a basis for interpretation. Not as an absolute limit but as an opportunity for reviewing deviations from the norm (mean reversion).

However, comparisons between individual firms within a particular industry, or within the firm itself (and certainly across industries) may be of limited value, given the size of the industry, the nature of competition, or the changing scale and diversity of operations (including those of the firm itself).

Review Activity

Our previous Activity reveals why there should be more to financial performance analysis than the interpretation of *historical* data contained in *ex post* company accounts. Management, accountants, auditors, fiscal authorities and governments have long defended such information by stating that they are only designed to provide an objective record of *stewardship*, primarily to satisfy a company's tax obligations.

Certainly, the *price* paid for assets and the derivation of income on this basis are *accountable* facts. And in this sense, accounting statements are *objective*. They are composed of "real" figures, which serve to represent a "true and fair" view according to financial accounting *concepts* and *conventions* (with which you should be familiar). However, without access to the managerial (insider) information that produced this data, they have limited utility for shareholders, creditors, potential investors, or any other external users of accounts who are primarily interested in assessing a firm's current performance and future plans.

To see why, consider the following published Balance Sheet data for Gaga plc (with a €25 million turnover and €5 million net profit) for which we have additional information, only available to management. Without even calculating any ratios, what does the insider information tell us about the utility of annual published financial statements for external users, even if we assume that Gaga's original figures are neither fraudulent, nor creative?

Balance Sheet	€000s	Insider (managerial) information
Land	20,000	(Bought 5 years ago)
Buildings	80,000	(60,000 spent 5 years ago, the balance representing the cost of subsequent additions at various dates)
Plant	40,000	(Various equipment bought on average 2 years ago)
Stock	5,000	(Many different items, bought on average 3 months ago)
Debtors	4,000	(Assumed to repay on average 3 months hence)
Cash	2,000	(Held for 2 months)
Totals	151,000	?

The first point to note is that most data published in corporate financial accounts throughout the world is actually *subjective*. Historically in the UK, for example, whether we begin with the nominal (par) issue value of ordinary shares (common stock) or corresponding net asset values in the Balance Sheet, sales turnover in the Trading and Profit and Loss Account, or end with the final transfers to reserves in the Appropriation Account, all the figures are *biased* toward GAAP concepts and conventions that underpin the UK accounting profession's *regulatory framework*.

Nominal share values do not correspond to *current* market values published in the financial press. *Current* sales turnover may include unforeseen *future* bad debt. Other factual *historical* costs also fail to reflect *current* economic reality and are dependent on forecasts. For example, the *net book value* of assets and by definition *net profit* (which is the *residual* of the whole accounting process) depend upon *future* estimates of useful asset lives, appropriate methods of depreciation and terminal values.

As we first observed in the Review Activity for Chapter One, published financial statements only show the position of a company on a certain date, *i.e.* when the Balance Sheet is drawn up ("struck"). Moreover, each represents a "snapshot" that is also several months old by the time it is published. For these reasons, they are a record of the past, which should not be regarded as a reliable guide to current activity, let alone the future. For this, we need to analyse published stock market data and to research analyst, press and media comment.

Secondly, they do not even provide a true picture of the past. For example, Gaga's Balance Sheet shows how much money has been spent. But not whether it has been spent wisely.

From the simple table above, numerous significant points emerge.

1. In the absence of fraud, each item in the list is a *fact* (an accurate record of transactions that have actually taken place). Every one represents actual money, or money paid and receivable. Except to the extent that there might been error (for example, equipment might have been bought and charged against current revenue, thus reducing profit and the asset figure below total cost) the list is a *factual* statement of assets owned and prices paid.
2. However, the Balance Sheet total of €151 million has no real meaning. It is a summation of euro's at different values (now, five years ago, three months hence, and so on) that equals the *nominal* value of authorised and issued share capital, plus the historical cost of reserves, loan stocks and other liabilities. It says nothing about *market* value and has about as much informational content as saying "four apples and three oranges equal seven fruit".
3. The Balance Sheet is likely to be valued incorrectly, even if the figures were adjusted for *overall* general monetary inflation (the economy's *average* price level change).
4. The list of assets does not provide any indication of their current *specific* worth, which may be above or below the overall rate of inflation.
5. The land could be ripe for development and saleable for €50 million. The specific cost of replacing the buildings and equipment in their present form might be €250 million. Moreover, the fixed assets might have a high or low market value compared with a year ago.
6. Current asset data may be equally misleading. Stocks, debtors and cash may have changed considerably since the Balance Sheet was "struck".
7. As a consequence, a significant disparity may exist between the "authorised and issued" *nominal* value and "real" *market* value of equity plus reserves, as well as debt. Yet none of this is revealed by the published accounts.
8. Finally, if we consider the initial summary Trading and Profit and Loss Account data also provided for Gaga, don't make the mistake of assuming that a €25 million sales turnover and €5 million net profit reflect economic reality, let alone whether either is good or bad.
9. Any sales figure (physical volume or financial value) is not much good if companies make little money from it. Asset utilisation may be inefficient; profit margins may be low and bad debts high (to the extent that a firm sells on credit).
10. Remember also, that the accountant's net profit may be an *accrual-based* subtraction of various historical costs from current revenue. And this figure does not necessarily correspond to the net cash inflow, to the extent that working capital inventory and other services have been bought and sold on credit. It is also adjusted for depreciation (which is a *non-cash* expense).

As a consequence, any interpretation of Gaga's historical accrual-based company report using conventional *ex-post* ratio analysis as a basis for measuring any aspect of its recent performance, let alone its *future* plans is deeply flawed.

3.6 Summary and Conclusions

As I have emphasised elsewhere in my bookboon series of finance texts, which are referenced at the end of Chapter One:

> Any increase in a company's *long-term* value (shareholder wealth) is determined by the *periodic* net cash inflow that management can first earn and subsequently distribute, without eroding its *original* capital base and hence that of the shareholders to whom they are ultimately responsible (the *agency* principle).

If we adopt these value criteria, however, there is an obvious conflict between a corporate *tangible asset* figure reported in published accounts (even based on current cost) and the *market price* of shares published in the financial press (which use income and dividend yield valuations based on discounted revenue theory).

- The former ignores the profitability of so many intangible items (goodwill, brand names and human resources, such as intellectual property, the quality of management and the workforce).
- The latter are forward looking and all-inclusive. Market valuations not only embrace the whole financial structure of the firm (fixed and working capital). They are also based upon a risk assessment of the present value (PV) analyses of projected cash flows, relative to a company's desired rate of return. These capture media comment, investor speculation and rumour, as well as government policy, changing social, economic and political circumstances at home and abroad.

> As a consequence, a company's "real" market rate of return, defined by its dividend yield or earnings yield (the reciprocal of the P/E ratio) may bear no relation to any interpretation of its overall return on capital employed (ROCE) or dividend per share and earnings per share (EPS) derived from the published financial accounts.

Thus, it follows logically that if a company's ROCE is suspect (which stands at the very the apex of a pyramid of ratios), then its very foundations (the secondary and tertiary ratios) including any analysis of its working capital position must also be questioned.

4 The Working Capital Cycle and Operating Efficiency

4.1 Introduction

The previous Chapter's Activities suggest that a conventional interpretation of working capital data contained in published financial statements may not only mislead external users of accounts but also contrast sharply with the overall wealth maximising objective of financial management, namely:

> To maximise the demand for a firm's products and services through optimum, profitable investments, financed at minimum cost.

To prove the case conclusively, we shall now confirm why the accounting concept of working capital (which defines an *excess* of current assets over current liabilities as an indication of financial strength) and its interpretation (often benchmarked by a 2:1 current asset ratio) is invariably suboptimal and way off target. As we shall discover:

> The normative objective of efficient working capital management should be to *minimise* current assets and *maximise* current liabilities, subject to the constraint of maintaining a sound liquidity position, which also maximises opportunities for fixed asset investment.

4.2 The Working Capital Cycle

When evaluating overall corporate performance it is not sufficient to calculate the working capital and liquidity ratios from the Balance Sheet and corresponding sales to net working capital ratios and cash velocity using turnover data. As we observed from Figure 3.1 in Chapter Three, it is also necessary to analyses the turnover ratios for other working capital constituents (notably the relationship between inventory, debtors and creditors).

One simple framework is given by an equation which defines how many times net working capital is "turned over" within the period under observation, relative to the rate at which goods are sold, debtors pay and the firm repays its own creditors, typically calculated from the data contained in published annual reports.

$$(5)\quad \frac{\text{Sales}}{\text{Net working capital}} = \frac{\text{Sales}}{\text{Stocks}} + \frac{\text{Sales}}{\text{Debtors}} \text{ minus } \frac{\text{Sales}}{\text{Creditors}}$$

As students of Financial Accounting you should also be familiar with reformulations of Equation (5) which express turnover in either days or months as follows:

$$(6)\quad \frac{\text{Net working capital}}{\text{Sales}} \times 365 = \frac{\text{Stocks}}{\text{Sales}} \times 365 + \frac{\text{Debtors}}{\text{Sales}} \times 365 \text{ minus } \frac{\text{Creditors}}{\text{Sales}} \times 365$$

$$(7)\quad \frac{\text{Net working capital}}{\text{Sales}} \times 12 = \frac{\text{Stocks}}{\text{Sales}} \times 12 + \frac{\text{Debtors}}{\text{Sales}} \times 12 \text{ minus } \frac{\text{Creditors}}{\text{Sales}} \times 12$$

You will see that each equation ignores cash turnover. Unlike stocks, debtors and creditors, it might not move in sympathy with sales. As we have observed elsewhere, cash has a variety of uses, which might not be related to any increase in sales. For example, loans may have been repaid one year to the next. Cash can also appear in the guise of new overdraft facilities that are not recorded in the velocity ratio (or even the Balance Sheet) even though they contribute to sales.

Note also that Equation (5) is *simplistic* because the debtor ratio is the only true *turnover* ratio, whereas the stock and creditor relationships are not. These don't compare like with like, because their denominators are expressed at *cost* but the numerators are at *selling price*. The stock and creditor ratios only exhibit their rate of variability with sales value. Nevertheless, these ratios are still useful indicators of the amount of working capital required to support sales and highlight a need for investigation if they deviate from standard or past trends.

A much more sophisticated analysis is provided by constructing a company's *working capital cycle* (or *net* operating cycle). This measures the average length of time between paying for raw materials that enter into inventory (the *financing* cycle) and the eventual receipt of cash from the sale of finished goods (the *operating* cycle, which also equals the *production* cycle for a trading company). You first encountered these cycles when we defined the objectives of working capital management in Chapter Two. The difference between the two, the *net* operating cycle is shown schematically in Figure 4.1.

As we shall discover, in this Chapter and the next, the net operating cycle is an important concept in working capital management, which improves upon our previous working capital ratios.

- Stocks and creditors are now related to their appropriate costs and not revenues. As such they are proper turnover ratios. On a par with debtors, they produce an analysis in physical terms (days) rather than monetary values.
- The greater the time lag between the operating cycle and the financing cycle, the more funds the company presumably needs to support production.
- The relative significance of the net operating cycle's constituents can therefore suggest where managerial effort should be expended to reduce funds, which are tied up in working capital.
- Conversely, the cycle reveals how profitability can be improved without putting undue strain on liquidity.

OPERATING CYCLE (days)

(i) Raw Material Turnover = Average value of raw material inventory / Daily raw material purchases

Plus

(ii) Production Cycle = Average value of work in progress / Daily average cost of sales

Plus

(iii) Finished Goods Turnover = Average value of finished goods / Daily average cost of sales

Plus

(iv) Customer Credit Period = Average value of debtors / Daily average sales

Minus

FINANCING CYCLE (days)

Suppliers Credit Period = Average value of creditors / Daily average purchases

Equals

NET OPERATING OR WORKING CAPITAL CYCLE (days)

Figure 4.1: The Working Capital Cycles

4.3 Operating Efficiency

Our study of working capital began by regarding an excess of current assets over current liabilities as highly desirable. Convention dictates that it measures the extent to which a company can finance any future increase in turnover. If the balance is zero, it may be a sign of trouble. The firm is assumed to possess no working capital, since the net cash inflows from future operating cycles must be committed to the payment of existing financial obligations. However, it is also important to realise that any "surplus" may be misleading, since it could relate to assets already committed to a firm's existing operating cycles.

As a consequence, only if a firm were to cease trading altogether would accounting notions of solvency and liquidity (based upon a static *ex post* Balance Sheet analysis) give any indication of its "true" credit-worthiness. As a *going concern*, it is the firm's ability to exploit its *future* trading position that determines an adequacy of cash resources to meet debts as they fall due.

As we shall discover, debt-paying ability is a *dynamic* concept, which should not depend upon external user attitudes (notably creditors) towards statements of *current* financial position, but rather the firm's *future* operating efficiency. This may be defined as the inter-relationship between:

- Future profitability
- The operating cycle (the conversion period of assets to cash),
- The financing cycle (the repayment period granted by creditors)

Review Activity

To illustrate why the *internal* dynamics of efficient working capital management can be at variance with its *external* interpretation, imagine that you initially commenced business on July 1st last year without any start-up capital.

Your intention was to exploit a gap in the market by importing specialist music CD boxed sets to the UK mainland from the UK Channel Islands, in order to avoid tax (which is quite legal).

At the beginning of each month, you acquired inventory of £5000 on three months credit. At the end of each month it was sold for cash. Your profit margin was 50 per cent on cost. Cash inflows from sales were not withdrawn. They were utilised to finance fixed asset investment (the purchase of business premises) at the beginning of each following month, compatible with your debt paying ability, to expand the subsequent year's operations.

You are required to produce beginning and end of month Balance Sheets, calculate their corresponding profitability, working capital, stock and creditor ratios for the first twelve months and interpret the results.

(a) Introduction

For the purpose of exposition, I have kept the example deliberately simple. The data relates to a *trading* and not a *manufacturing* company, which we shall consider in Chapter Five. So, there are no raw materials, or work in progress, to complicate our analysis. The absence of any start-up capital (ownership or debt) also enables us to focus on the *flexibility* of working capital investment. Specifically, how creditor finance or cash surpluses can be diverted to fixed asset formation, without compromising a firms "real" solvency or liquidity positions.

Beginning and end month Balance Sheets for the *first quarter* are reproduced in Table 4.1, assuming that the "terms of trade" for customers and suppliers remain *constant* throughout the twelve month period and none of the sequential fixed asset investments have been sold. I have left you to calculate the Balance Sheets for the *remainder* of the year to confirm the figures that I have also provided for July 1st twelve months later. Table 4.2 then provides a summary of the requisite financial ratios derived from Table 4.1 as a basis for interpretation.

(b) The Balance Sheets

July 1st				**July 31st**			
Creditors	5,000	Stock	5,000	Profit	2,500	Cash	7,500
				Creditors	5,000		
					7,500		7,500
August 1st				**August 31st**			
Profit	2,500	Fixed Assets	7,500	Profit	5,000	Fixed Assets	7,500
Creditors	10,000	Stocks	5,000	Creditors	10,000	Cash	7,500
	12,500		12,500		15,000		15,000
September 1st				**September 30th**			
Profit	5,000	Fixed Assets	15,000	Profit	7,500	Fixed Assets	15,000
Creditors	15,000	Stocks	5,000	Creditors	15,000	Cash	7,500
	20,000		20,000		22,500		22,500
October 1st				**Next July 1st**			
Profit	7,500	Fixed Assets	17,500	Profit	30,000	Fixed Assets	40,000
Creditors	15,000	Stocks	5,000	Creditors	15,000	Stocks	5,000
	22,500		22,500		45,000		45,000

Table 4.1: Statements of Financial Position

(c) The Ratios

Now we can reformulate Table 4.1 using a selection of financial ratios within a coherent framework as a basis for interpretation.

- Profitability in terms of return on assets (ROCE), net profit margins and asset utilisation,
- Working capital, using current asset and liquidity ratios,
- The operating cycle (stock turnover),
- The financing cycle (creditor turnover).

	July		August		September		October	Next July
	1st	31st	1st	31st	1st	30th	1st	1st
Profitability								
Return %	-	33.3	20	33.3	25	33.3	33.3	66.6
Margin %	-	33.3	33.3	33.3	33.3	33.3	33.3	33.3
Utilisation	-	1:1	0.6:1	1:1	0.75:1	1:1	1:1	2:1
Working Capital								
Current Ratio	1:1	1.5:1	1:2	0.75:1	1:3	1:2	1:3	1:3
Liquidity Ratio	-	1.5:1	-	0.75:1	-	1:2	-	1:3
Operating Cycle								
Stock Turnover (months)							1	1
Financing Cycle								
Creditor Turnover (months)							3	3

Table 4.2: The Financial Ratios

(d) The Interpretation

The first point to note is that although the ratios correspond to those calculated by external users of published financial statements, the firm's creditors (the only external user group, apart from auditors and the tax authorities) would not have access to all this the information. Even in the corporate sector, at best they may have an interim report. Alternatively, they will only have access to a Balance Sheet on the date it is drawn up ("struck") at the year's end as a basis for interpretation (say next July 1st in our example).

Secondly, without access to further managerial (insider) information that the terms of trade remained the same throughout the period:

- Inventory was acquired on three months credit and sold for cash at the end of each month.
- Cash from sales was not withdrawn but utilised to finance fixed asset investment at the beginning of the following month.

All the published year end ratios highlight are a confusing report of high profitability underpinned by a working capital *deficiency*.

So, how do we reconcile this conventional interpretation of your firm's *ex post* performance with its internal business *dynamics*, even if we assume that prices remained constant throughout the period?

(d) The Interpretation

(i) Profitability

The Review information provided in Table 4.2 reveals that whilst monthly turnover and profit margin remains the same, the sales to asset ratio and hence the overall rate of return (ROCE) fluctuates during the first quarter, thereafter rising to the year-end. Yet, your firm has adopted a policy of consistently maximising its reinvestment potential, rather than allowing cash to lie idle, or repay creditors prior to their due date.

Obviously, using the funds of others at no explicit cost for your benefit (in order to set up the business and subsequently finance its future operation) is extremely efficient. Unfortunately, it has a depressing effect on "reported" profitability when reinvestment is higher (August and September), but a beneficial effect thereafter.

There is also the question of whether a higher *rate* of return on lower capital employed is preferable to a lower return on higher capital, or vice versa. In *absolute* terms, your business is definitely more profitable by September 1st than the previous July 31st. But with the exception of the profit margin, all that conventional financial ratio analysis reveals is a significant deterioration in efficiency.

(ii) Working Capital

The decline in working capital is a corollary to the build up of creditors and the transformation of cash into fixed assets. In August, working capital is negative and for the most part liquidity is non-existent. By July of the following year, both the current and liquidity ratios are still highly unfavourable at 1:3 respectively. But you are neither insolvent, nor illiquid, unless you were to cease trading altogether.

(iii) The Net Working Capital Cycle

Given the terms of trade, you are well able to meet your financial obligations when they first fall due in October. Moreover, you can still continue to invest £2,500 elsewhere. Reversing conventional logic, it is no accident that the relationship between the operating and financing cycles, first revealed on October 1st is also 1:3. Inventory is being profitably converted to cash three times quicker than debts are being legitimately paid. All other things being equal, only if credit had been granted to customers, perhaps accompanied by bad debt loss (thereby, increasing the operating cycle) or suppliers demanded earlier repayment (reducing the financing cycle) would you have experienced a cash shortage, leading to possible insolvency. Yet, ironically, all the Balance Sheet analysis would reveal is an increase in current assets, a reduction in current liabilities perhaps culminating in a "positive" net working capital position!

4.4 Summary and Conclusions

This Chapter's Review Activity vividly illustrates what we have mentioned earlier. How a conventional interpretation of working capital data contained in published financial statements may not only mislead *external* users of accounts but also contrast sharply with the overall wealth maximising objective of *internal* financial management, namely:

> To maximise the demand for a firm's products and services through optimum, profitable investments, financed at minimum cost, all determined by its terms of sale.

To prove the case, we have confirmed why the accounting concept of working capital (which defines an *excess* of current assets over current liabilities as an indication of financial strength) and its interpretation (often benchmarked by a 2:1 current asset ratio) may be suboptimal and way off target.

As we shall discover in our final Chapter (in line with the only logical conclusion from our previous Review Activity):

> The normative objective of efficient working capital management should be to *minimise* current assets and *maximise* current liabilities, subject to the constraint of maintaining a sound liquidity position, which also maximises opportunities for fixed asset investment.

5 Real World Considerations and the Credit Related Funds System

5.1 Introduction

Before concluding our study of working capital management, let us summarise our position so far.

We began by explaining why an excess of current assets over current liabilities (net working capital) revealed by published financial statements is highly desirable. Conventional accounting analysis dictates that if the balance is positive it measures the extent to which a company can finance any future increase in sales turnover, or alternatively fixed asset investment.

Conversely, if the balance is zero, or worse still negative, it may be a sign of trouble. The firm is assumed to possess no working capital, since the net cash inflows from future operations must be committed to the repayment of existing financial obligations.

However, we have also noted why an interpretation of a "surplus" as an indicator of financial strength may be misleading. It could relate to assets (fixed or current) already committed to a firm's existing operations. Likewise, a working capital "deficiency" might be a temporary consequence of a sound investment strategy designed to generate future profitability.

Only when firms cease trading do accounting notions of *solvency* and *liquidity* give any indication of their "true" credit-worthiness. As a *going concern*, it is a firm's ability to exploit its *future* trading position that determines an adequacy of cash resources to meet debts as they fall due.

5.2 Real World Considerations

Debt-paying ability is a *dynamic* concept, which should not depend upon external user attitudes (notably creditors) towards statements of *current* financial position, but rather the firm's *future* operating efficiency. This was defined in the previous Chapter as the inter-relationship between:

- Future *cash* profitability,
- The operating cycle (the conversion period of assets to cash),
- The financing cycle (the repayment period granted by creditors).

Even within the context of providing creditor information, the traditional notion of working capital is suspect. You will recall that we began our review of an accounting approach to its analysis with a number of anomalies.

We observed that solvency underpinned by liquidity is a *cash flow* concept. Yet its evaluation using published financial statements is placed within a pyramid of ratios. This defines profitability (ROCE) at its apex as revenues minus expenses on an *accrual* basis. So, taking a worst case scenario, a firm might generate sales. But what if its customers fail to pay? Debtors will rise, thereby increasing current assets, perhaps "improving" its working capital position. A "profit" will still be recorded in the published accounts and taxed. Shareholders will anticipate a dividend. Employees may demand a pay rise on the strength of this. Yet, none of these events are supported by a corresponding cash inflow.

There is also the vexed question of inflation in historical cost accounts. We all know that price level changes distort financial ratios because revenue flows are valued at different times and by different amounts, relative to assets, costs and expenses. Even the cash figures will be at different values to those used for reporting sales over the period.

Finally, not only are accounting profitability and cash flow liquidity different concepts, they can also move in different directions. Many decisions to improve profitability may have an adverse effect on liquidity and *vice versa*. One obvious example is fixed asset investment, which compromises current debt-paying ability. Another is a build up of liquid assets as interest rates fall. To return to the previous Chapter's theoretical proposition:

> The normative objective of efficient working capital management should be to *minimise* current assets and *maximise* current liabilities (underpinned by the terms of sale to debtors and creditors) subject to the constraint of maintaining a sound liquidity position, which also maximises opportunities for fixed asset investment.

Unfortunately, even with access to the cash flow information that satisfies this objective, it is debatable whether creditors would tolerate the firm it supplies receiving payment from customers before they are paid (revealed by turnover ratios). Debtors too, may take their trade elsewhere. Much depends upon the bargaining positions of suppliers and customers relative to the company concerned, the nature of competition and state of the economy.

Disparities between *internal* cash flow and *reported* accounting profit explain why companies are mindful of external user attitudes and choose favourable publication dates for their accounts.

When balancing profitability, solvency and liquidity, *window dressing* can also come into play before companies publish their accounts. Because conventional wisdom dictates that external users feel comfortable with current asset ratios of 2:1 and liquidity ratios in excess of 1:1, levels of inventory, cash and marketable securities can be temporarily adjusted by management. Creditors may be repaid early and overdraft facilities reviewed. Even dividend and investment policies can be modified. In this way, the "true" internal working capital position during the preceding period can be disguised by legitimate *creative* accounting techniques to confound its year-end interpretation by external users.

For those outside the firm (looking in) the relationship between a company's operating and financial cycles also becomes more problematical if it is a *manufacturer*, rather than a *trader* (like the firm analysed in our previous Chapter's Review Activity).

If you refer back to Chapter Two (Figure 2.2) and Chapter Four (Figure 4.1) we observed that the net operating cycle for a manufacturing company is not simply the comparatively short period of time taken by a trading company to sell products or services *bought in*. It is the extended period between expenditure on raw materials, work in progress, finished goods and the eventual receipt of cash (which includes the period of credit granted to customers) less the time taken to pay suppliers.

Apart from the high degree of estimation associated with the fact that company accounts may be based on historical cost (which weakens their analysis) from a regulatory perspective, there may also be no legal requirement to publish detailed categories of inventory, such as investment in raw materials and work in progress, nor provide purchase figures.

Activity 1

Kraftwork plc (£million)

	Year One	Year Two	Average
Raw material purchases	85.0	90.2	87.6
Cost of goods sold	125.0	140.0	132.5
Sales	136.0	156.0	146.0
Raw material inventory	18.0	20.4	19.2
Work in progress inventory	12.5	14.5	13.5
Finished goods inventory	10.0	15.0	12.5
Debtors	26.5	29.5	28.0
Creditors	11.0	13.0	12.0

Let us assume that as a basis for analysis, we have access to all the managerial data, including categories of inventory and raw material purchases, contained in the Table above for Kraftwork plc.

a) Using a traditional working capital approach, summarise the company's position one year to the next.
b) Reformulate the data to produce *average* turnover ratios and tabulate the company's *average* operating, financing and net operating cycles.
c) Comment briefly on your results.

(a) Working Capital

The first points to note are that current assets are significantly higher than current liabilities in both years, so that on *average* the firm remains theoretically solvent. Comparing one year to the next, net working capital (current assets minus current liabilities) has also risen from £56 million to £66.4 million.

(b) The Working Capital Cycles

OPERATING CYCLE (days)					
1.	Raw Material Turnover	=	average value of raw material inventory / daily raw material purchases	19.2 / 0.24	= 80
2.	Production Cycle	=	average value of work in progress / daily average cost of goods sold	13.5 / 0.363	= 37
3.	Finished Goods Turnover	=	average value of finished goods / daily average cost of goods sold	12.5 / 0.363	= 34
4.	Customers' Credit Period	=	average value of debtors / daily average sales	28 / 0.4	= 70
	TOTAL (Days)				221
FINANCING CYCLE (days)					
5.	Suppliers' Credit Period	=	average value of creditors / daily average sales	12 / 0.24	= 50
NET OPERATING CYCLE (days)					171

Kraftwork plc: The Working Capital Cycles

Using the formulation explained in Chapter Four (Figure 4.1) we can transform the *annual* accounting data for Kraftwork to reveal an *average* operating cycle well in excess of its corresponding financing cycle. The average, *net* operating cycle, expressed in days itemised above, is obtained by calculating the arithmetic means of the respective turnover ratios for each year and subtracting the creditor figure from inventories plus debtors.

(c) The Interpretation

The net operating cycle confirms the firm's overall working capital position. Kraftwork remains theoretically solvent. However, because the *turnover* ratios that define the working capital cycles are based on *annual* data, they have been distorted by all the variations in current assets and liabilities, which have occurred from one period to the next. So, each component requires further investigation.

The *periodic* increase in net working capital may be justified and interpreted as an indicator of financial strength. Particularly because it is accompanied by an increase in sales and a proportionately greater increase in gross profit (measured by sales less cost of goods sold).

On the other hand, perhaps there have still been missed opportunities for economies of scale. All aspects of stock turnover should have been increased, debtor policies tightened, and the period of credit granted by suppliers extended, subject to no loss of goodwill.

Unfortunately, only internal management has access to this *qualitative* information, leaving external users of accounts with a *quantitative* analysis of the financial data that the company chooses to provide.

5.3 The Credit Related Funds System

The operating cycle defines the period taken to convert assets to cash for a particular level of demand. It provides us with a basis for calculating the amount and timing of a firm's working capital requirements relative to its financing cycle over a given period.

Whilst at any point in time there may be a number of operating cycles, all at different stages of completion, initial finance will only be needed for raw materials. As wages and other conversion costs are incurred to support production, and materials are replenished, the amount will increase. The ongoing costs of holding finished goods, selling on credit, plus the need for precautionary cash balances associated with fluctuating demand and bad debt loss must also be considered.

On the financing side, the firm will need to borrow, in order to sustain production before cash is received from customers. This too, entails a cost that is tied to the volume, structure and duration of the operating cycle. The longer the cycle, the more financial resources the firm needs. The optimal level of working capital is, therefore, an amount that does not strain liquidity, but results in no cash surplus.

In an ideal world, where the supply of stocks is perfectly elastic, a firm would hold no inventory (as just-in-time philosophy dictates). Faced with the choice, it would sell on a cash basis, rather than credit. Cash itself would not be kept idle, but utilised to finance fixed asset investment, redeem debt, or returned to the shareholders in the form of dividends.

In contrast, the extent to which current liabilities represent a low cost source of finance means that a firm would maximise creditors compatible with its debt paying ability and financial needs. As a consequence, in an ideal world, it would hold no current assets but finance at least part of its activities *via* the short end of the market (*i.e.* current liabilities).

Real world considerations may alter this precise situation. Nevertheless, the rational, wealth maximising firm should still strive to minimise current assets and maximise current liabilities. As we have stated elsewhere throughout the text, given sales and cost considerations, the objectives of working capital management are two-fold:

- The determination of optimum (i.e. minimum) investments in inventory, debtors and cash.
- The acquisition of an optimum (i.e. maximum but least-cost) balance of finance.

Subject to the constraint of maintaining a sound liquidity position that also maximises opportunities for fixed asset investment, the net inflow of cash will be maximised, thereby satisfying the normative expected net present value (NPV) criteria of financial management.

5.4 Summary and Conclusions

The *preceding analysis*:

- Distinguishes between the *internal* working capital management function and an *external* interpretation of a firm's working capital position, revealed by its published accounts,
- Explains the significance of a company's working capital *operating* cycle and *financing* cycle derived from published data and analysed the inter-relationship between the two, namely its *net* operating cycle,
- Defines the *dynamics* of a company's credit-related funds system, having hinted throughout the text at the *pivotal* role of its terms of sale, as a basis for efficient working capital management.

As a *guide to further study*:

It is important to realise that corporate cash flows are ultimately the product of sales resulting in cash received, or a claim to cash from debtors. Hence, the maximisation of net cash inflows may be achieved by raising the level of sales but not necessarily reducing the level of debtors.

Since there is little point in offering trade credit if the aim is not to generate sales, the extent to which most firms actually sell on credit suggests that the credit function should occupy a pivotal position in working capital management. As a corollary, (contrary to the balance of literature on the subject) other items such as inventories, creditors, securities and cash should be regarded as entirely subordinate.

Unfortunately, one reason that must be ascribed to a build up of debtors in any economy is the traditional indifference with which credit policy in general and credit terms in particular have been treated by the academia and financial practice.

As a result, recommendations for improved methods of controlling investment in debtors invariably underline the amount of credit to be granted and standard collection procedures but treat the terms of sale as given.

In practice, of course, the terms of sale are frequently *given* in the sense that they are often based on custom or tend to be invariant over time and thus represent an institutionalised aspect of management. In principle, however, this should not go unchallenged. It is neither rational (customary terms are rarely if ever appraised in terms of their operationally or optimum design) nor is it universally upheld. Indeed if a firm is unique with respect to its production function, access to capital markets, class of customer and so on, its terms of sale may also be unique. Consequently, credit terms need not be just a precondition of trade, which determine an arbitrary investment in debtors.

On the contrary, they should be viewed as a potentially powerful component of a firm's *marketing strategy* which, when skilfully utilised, can directly influence demand, determine a firm's working capital requirements and materially enhance future profitability.

To understand why, you can download either *Working Capital and Strategic Debtor Management* (2013), or the shorter Business text *Strategic Debtor Management and Terms of Sale,* 2013).

Each study:

- Explains how the terms of sale (represented by the credit period, cash discount and discount period) underpin the credit related funds system and determine the demand for a firm's goods and services,
- Evaluates the impact of alternative credit policies on the revenues and costs which are associated with a capital budgeting decision,
- Compares the disparities between the theory and practice of working capital management, given our fundamental normative assumption that firms should maximise wealth.

5.5 Selected References

Hill, R.A., bookboon.com.

Text Book:

Working Capital and Strategic Debtor Management, (*WC&SDM*), 2013.

Business Text:

Strategic Debtor Management: and Terms of Sale, 2013.