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Working Capital and Debtor Management: Exercises

Robert Alan Hill

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Exercises

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Working Capital And Strategic Debtor Management: Exercises
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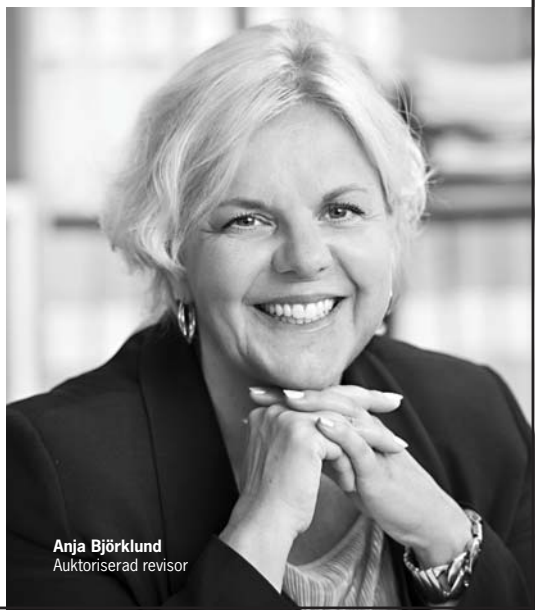

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About the Author

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.

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Part One:
An Introduction

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1 An Overview

1.1 Introduction

Irrespective of the research area (whether in the physical or social sciences) a logical procedure when constructing theoretical models has always been to make *simplifying assumptions* to improve our understanding of the real world. As a convenient benchmark, all the texts in my bookboon series (referenced at the end of this Chapter) therefore begin with an *idealised* picture of investors (including management) who are *rational* and *risk-averse*, operating in reasonably *efficient* capital markets. With a free flow of information and no barriers to trade, they can formally analyse one course of action in relation to another for the purpose of wealth maximisation with a degree of confidence.

In a sophisticated mixed economy, summarised in Figure 1.1 below, where the ownership of corporate assets is divorced from control (the *agency* principle), we can also define and model the *normative* goal of strategic financial management under conditions of certainty as:

- The implementation of investment and financing decisions using net present value (NPV) maximisation techniques to generate money profits from all a firm's projects in the form of retentions and distributions. These should satisfy the firm's *existing* owners (a multiplicity of shareholders) and *prospective* investors who define the capital market, thereby maximising share price.

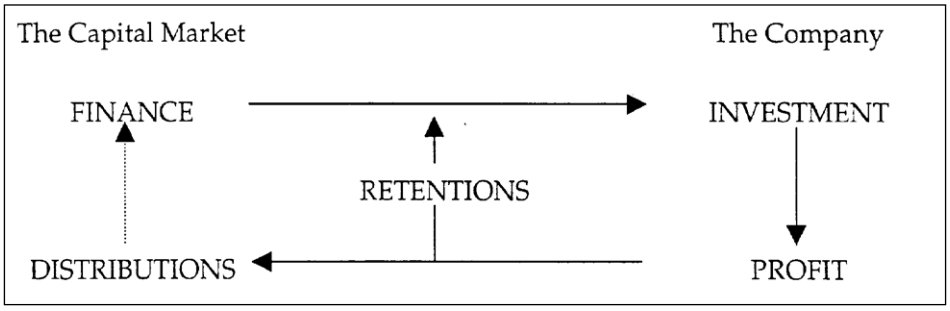

Figure 1.1: The Mixed Market Economy

Over their life, individual projects should eventually generate cash flows that *exceed* their overall cost of funds (i.e. the project discount rate) to create wealth. This *positive* net terminal value (NTV) is equivalent to a *positive* NPV, defined by a recurring theme of strategic financial management, namely the time value of money (*i.e.* the value of money over time, irrespective of inflation) determined by borrowing and lending rates.

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If we now relax our assumptions to introduce an element of uncertainty into management's project brief, policies designed to maximise wealth therefore comprise two distinct but nevertheless *inter-related* functions.

- The *investment function*, which identifies and selects a portfolio of investment opportunities that *maximise expected net cash inflows* (ENPV) commensurate with risk.
- The *finance function*, which identifies potential fund sources (equity and debt, long or short) required to sustain investments, evaluates the *risk-adjusted* return expected by each, then selects the optimum mix that will *minimise* their overall weighted average cost of capital (WACC).
- Companies engaged in inefficient or irrelevant activities, which produce losses (negative ENPV) are gradually starved of finance because of reduced dividends, inadequate retentions and the capital market's unwillingness to replenish their asset base, thereby producing a fall in share price

Figure 1.2 distinguishes the "winners" from the "losers" in their drive to create wealth by summarising in financial terms why some companies fail. These may then fall prey to take-over as share values plummet, or even become bankrupt and disappear altogether.

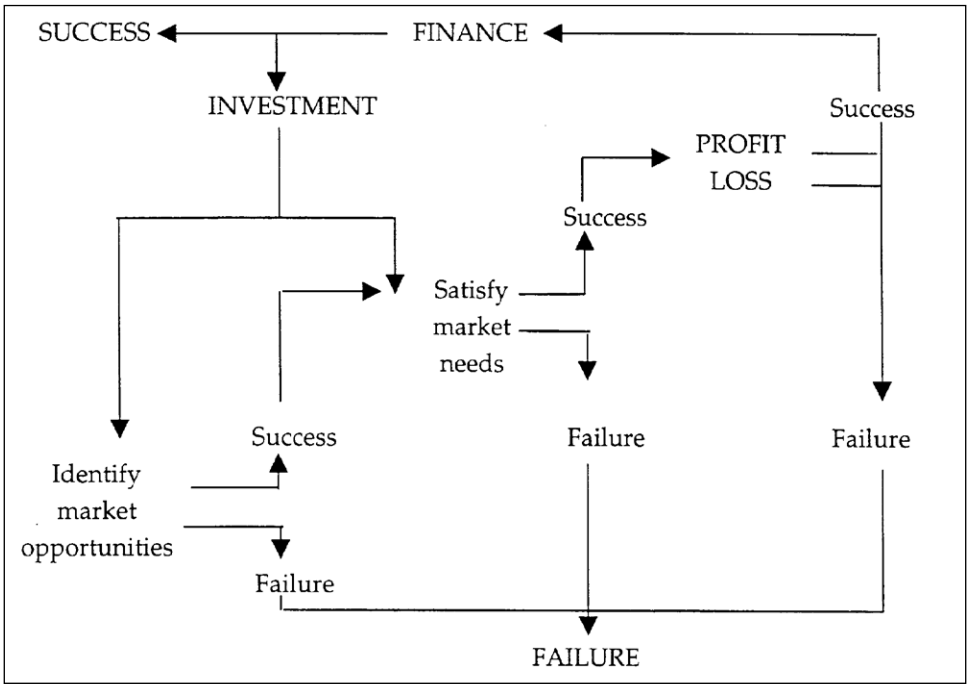

Figure 1:2: Corporate Economic Performance – Winners and Losers.

Figure 1.3 summarises the strategic objectives of financial management relative to the inter-relationship between *internal* investment and *external* finance decisions that enhance shareholder wealth (share price) based on the law of supply and demand to attract more rational-risk averse investors to the company.

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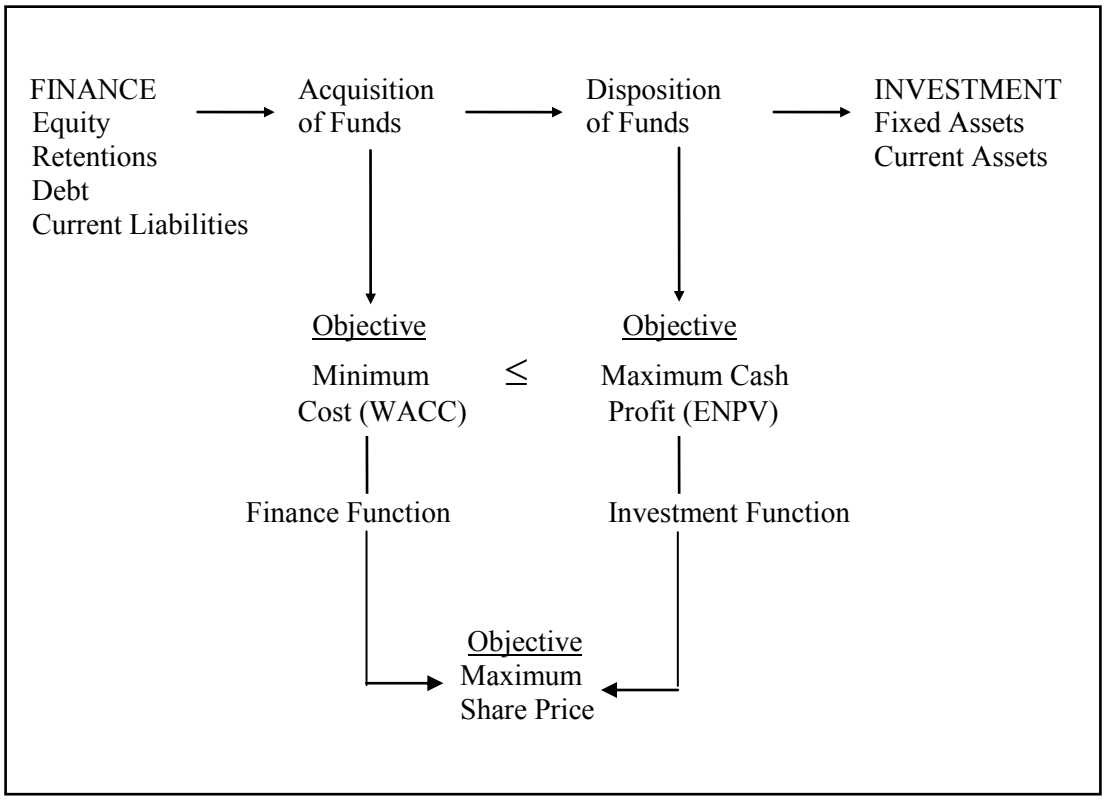

Figure 1.3: Corporate Financial Objectives

The diagram reveals that a company wishing to maximise its wealth using share price as a *vehicle*, must create cash profits using ENPV as the *driver*.

Management would not wish to invest funds in capital projects unless their *marginal* yield at least matched the rate of return prospective investors can earn elsewhere on comparable investments of equivalent risk

Cash profits should then exceed the overall cost of investment (WACC) producing a positive ENPV, which can either be distributed as a dividend or retained to finance future investments

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1.2 Working Capital Management

Moving from the general to the particular, if you are also acquainted with any of my working capital and strategic debtor management Theory and Business texts referenced at the end of this Chapter (bookboon 2013) you will appreciate that once a project is up and running, companies must ensure that their periodic financial requirements, relative to short-term cash inflows (working capital) still satisfy overall wealth maximisation criteria. Within the framework of investment and finance summarised in Figure 1.3, the *efficient* management of current assets and current liabilities 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.

Explained simply, using our earlier analogy:

> Capital budgeting is the *engine* that drives the firm. But working capital management provides the *fuel* that moves it foreword.

You should also be familiar with the following *glossary* of terms, their interpretation and implications for financial management.

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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. In other words, it represents the capital available for conducting its day to day operations.

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), cash and "near" cash (such as short term investments 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, loans and tax payable.

If working capital, as defined, exceeds *net* current operating assets (stocks plus debtors, less creditors) the company has a *cash surplus*, represented by cash or near cash. If the reverse holds, it has a *cash deficit*, represented by overdrafts, loans and tax payable. Thus, the strategic management of working capital can be conveniently subdivided into the control of stocks, debtors, cash and creditors.

Referring back to Figure 1:2 (Corporate Economic Performance, Winners and Losers), from a working capital perspective companies must generate sufficient cash to meet their immediate obligations, or cease trading altogether. Cyclically, unprofitable firms may continue if they can borrow temporarily until conditions improve. But otherwise, without access to sufficient liquid resources they will remain *technically insolvent* and eventually fail. Working capital is therefore essential to a company's long term economic survival. For this reason, conventional accounting wisdom dictates that the more current assets "cover" current liabilities (particularly cash or near cash, rather than inventory) the more *solvent* the company. In other words, the greater the degree to which it can meet its short term obligations as they fall due.

However, you will also recall from my previous texts on the subject, that this conventional definition of working capital is a *static* Balance Sheet concept. It only defines an excess of permanent capital (equity and debt) plus long-term liabilities over the fixed assets of the company at one point in time. This "snapshot" may bear no relation to a company's *dynamic* cash flow position, which fluctuates over time. Moreover, it depends on generally accepted accounting principles (GAAP) based on accruals and prepayments, such as definitions of capital, revenue, profit (including retentions), when revenue should be recognised and the distinction between the long and short term, typically twelve months from the date the Balance Sheet is "struck" for published financial statements.

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For these reasons, the Exercises throughout this study:

Subscribe to a more flexible definition of working capital and its interpretation, namely an investment in current assets *irrespective* of their financing source.

Reject the accounting conventions with which you may be familiar, that firms should strive to maintain a short term 2:1 working capital (solvency) ratio of current assets to current liabilities, underpinned by a 1:1 "quick" asset (liquidity) ratio of debtors plus cash to current liabilities. Both policies are invariably sub-optimal as normative wealth maximisation criteria

Accept that management's strategic objective should be to *minimise* current assets and *maximise* current liabilities compatible with their *liquidity* (debt paying ability) based upon *future cash profitability*.

These points were proven in the previous texts by reference to the interrelationship between a firm's short-term *operating* and *financing* cycles in an *ideal* world, whereby:

Inventory is purchased on *credit* using "just in time" (JIT) inventory control techniques.

Finished goods are sold for *cash* on delivery (COD).

Cash surpluses do not lie idle, but are reinvested or distributed as a dividend.

So that:

The operating cycle (conversion of raw material to cash and its reinvestment or distribution) is shorter than the financing cycle (creditor turnover).

As a consequence, current liabilities may exceed current assets without any threat of insolvency.

1.3 Strategic Debtor Management

Having begun with an over-arching definition of the normative objective of strategic financial management as the maximisation of expected net cash inflows at minimum cost (the ENPV decision rule) my bookboon series on working capital develops another critique within this context.

The efficient management of working capital is not only determined by an *optimum* investment in current assets and current liabilities, which departs from accounting convention (where solvency and liquidity ratios of 2:1 and 1:1 may be an irrelevance). But, given the extent to that most firms sell on credit to increase their turnover.

Many practicing financial managers not only fail to model the dynamics of their company's *overall* working capital structure satisfactorily. They also misinterpret the functional inter-relationships between its *components*.

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Contrary to the balance of academic literature on the subject (which focuses on cash management and inventory control as the key to success):

- The *pivotal* predeterminant of working capital efficiency should relate to accounts receivable (debtor) policy, which is a function of a company's *optimum* terms of sale to discounting and non-discounting customers that may be unique and need not conform to industry "norms".
- Variations in the cash discount, discount period and credit period all represent dynamic *marketing* tools.
- Based upon the time value of money and opportunity cost concepts, the terms of sale create purchasing power for customers, which should enhance demand for the creditor firm and hopefully net profits from revenues.

Optimum terms of sale not only determine a company's optimum investment in debtors but as a consequence its *optimum* investments in inventory, cash and creditors, which when set against each other, not only define its structure of current assets and liabilities but also its overall working capital requirements.

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1.4 Exercise 1: The Terms of Sale

We have assumed that companies wishing to maximise shareholder wealth using ENPV techniques within the context of project appraisal should:

- *Maximise* current liabilities and *minimise* current assets compatible with their *debt paying ability*, based upon *future cash profitability* determined by its *terms of sale,*
- *Optimise* terms of sale to determine *optimum* working capital balances for inventory, debtors, cash and creditors,

However, this presupposes that management can initially model the differential impact of their credit terms on future costs, revenues and hence profits when formulating an optimum debtor policy. Otherwise, they are hopelessly lost.

Required:

To prove the previous point (and as a guide to later Exercises in this study) using your bookboon reading:

Summarise how the terms of sale represented by the cash discount, discount period and credit period within a mathematical framework of *effective* prices underpin the demand for a firm's goods and services.

If you need help with your answer, I recommend that you refer to either Chapter Six or Chapter Two of the bookboon texts with which you are familiar: "Working Capital and Strategic Debtor Management" or "Strategic Debtor Management and Terms of Sale" respectively.

An Indicative Outline Solution

Both Chapters referenced above, depart from a conventional external Balance Sheet ratio analyses of a firm's current asset (operating) and current liability (financing) cycles to reveal why:

> Optimum terms of sale determine an overall working capital structure, which comprises *optimum* investments in inventory, debtors, cash and creditors, where current assets need not "cover" current liabilities.

To prove the case, (using the common Equation numbering from either reference) the following mathematical framework was derived to determine optimal credit policies in future Chapters.

The incremental gains and losses associated with a creditor firm's terms of sale were evaluated within a framework of "effective" prices, based on the *time value of money* using the following Equations from Chapter Six and Two. These define the customers' *credit price* (P') and *discount price* (P") associated with "effective" price reductions, arising from delaying payment over the credit or discount period, respectively.

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$$(9) \qquad P' = P\left(1 - \frac{rT}{365}\right)$$

$$(11) \qquad P'' = P\left[(1-c) - \frac{rt}{365}(1 - c)\right]$$

Where buyers of a firm's product at a *cash* price (P) are offered terms of (c/t:T) such as (2/10:30):

(c) = the cash discount (2%)

(t) = the discount period (10 days)

(T) = the credit period (30 days)

Because (P') differs from (P") we analysed how the introduction of any cash discount into a firm's period of credit influences the demand for its product and working capital requirements. When formulating credit policy, management must therefore consider the *division of sales* between discounting and non-discounting customers.

For any combination of credit policy variables, the buyer's decision to discount depends upon the *cost* of not taking it exceeding the *benefit*.

The *annual benefit* of trade credit can be represented by the customer's *annual opportunity cost* of capital rate (r). Because non-discounting customers delay payment by (T- t) days and forego a percentage (c), their *annual cost of trade credit* (k) can be represented by:

$$(12) \quad k = \frac{365}{(T - t)} c$$

Thus, if purchases are financed by borrowing at an opportunity rate (r) that is *less* than the annual cost of trade credit (k) so that:

$$(13) \quad r < k = \frac{365}{(T - t)} c$$

The buyer will logically take the discount.

From the *seller's* perspective, we then confirmed that:

To increase the demand for its products, a firm should design its credit periods to entice low effective price (*high* opportunity rate) buyers, whereas the cash discounts should be utilised to provide a lower cash price for those customers with *low* opportunity rates.

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To summarise: with a COD price (P) on terms (c/t: T) and a customer opportunity rate (r), the *effective* price framework and discount decision can be expressed mathematically as follows:

Price	COD (P)	Credit Price (P')	Discount Price (P")
	P	P [1-(rT/ 365)]	P [(1-c) - (r t / 365) (1-c)]
Decision			
r < k = 365c / (T-t)		P' > P" < P	Take the discount
r > k = 365c / (T-t)		Opt for the credit period	P' < P" < P

1.5 Summary and Conclusions

The remaining series of Exercises contained in this study are designed to complement and develop your understanding of working capital management and the strategic marketing significance of debtor policy within a theoretical context of wealth maximisation and empirical research.

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The accounting convention that management must present an image of solvency and liquidity to the outside world by maintaining an *excess* of current assets over current liabilities is seriously questioned. A firm's objectives should be to *minimise* current assets and *maximise* current liabilities *compatible* with its debt paying ability, based upon *future* cash profitability, all dictated by *optimum* terms of sale, which may be unique.

Squaring the circle, *optimum* terms of sale determine *optimum* working capital balances for inventory, debtors, cash and creditors.

Like my previous bookboon texts in the working capital series, some topics will focus on financial numeracy and mathematical modelling. Others will require a literary approach. There is also an expanded case study based on your earlier reading of the texts.

The rationale is to vary the pace and style of the learning experience by not only applying the mathematics and accounting formulae, but also by developing your own arguments and critique of the subject as a guide to further study.

1.6 Selected References

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Part Two:
Working Capital Management

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2 The Objectives and Structure of Working Capital Management

2.1 Introduction

In the previous Chapter, we observed that from an *external* user's analysis 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).

However, from an *internal* financial management perspective, these accounting definitions were shown to be far too simplistic, a view supported by most contemporary writers and commentators on the subject (academic or otherwise).

For example, the popular "Guide to Financial Management" by John Tennent (2013) which is well worth reading, maintains that corporate management's skill is not simply how to record transactions, interpret the details of financial reporting and monitor any deviations in performance. It begins with a company's "mission" statement, namely knowledge of its long-term objectives, strategy and tactics at the highest level. To ensure that investment and financing decisions conform to the mission, management also need to be aware of the consequences of their actions from the outset, by creating a strategic plan incorporating the likely effects of any changes to its existing activity.

The following Exercises should clarify these issues from a working capital perspective.

2.2 Exercise 2.1: Financial Strategy: An Overview

If the normative objective of financial management is the maximisation of shareholder wealth, a company requires a "long-term course of action" to satisfy this objective. And this is where "strategy" fits in.

Required:

1. Define Corporate Strategy
2. Explain the meaning of Financial Strategy?
3. How does strategy differ from "tactical" and "operational" planning?

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An Indicative Outline Solution

1. Corporate Strategy

Strategy is a course of action that specifies the monetary, physical and human resources required to achieve a predetermined objective, or series of objectives, which satisfies the corporate mission statement.

Corporate Strategy is an over -arching, long-term "plan of action" that comprises a co-ordinated portfolio of functional business strategies (finance, marketing etc.) designed to meet the specified objective(s).

2. Financial Strategy

Financial Strategy is the portfolio constituent of the corporate strategic "plan" that embraces optimum investment and financing decisions required to attain an overall specified objective.

3. Strategic, tactical and operational planning.

- Strategy is a long-run *macro* course of action.
- Tactics are an intermediate plan designed to satisfy the objectives of the agreed strategy.
- Operational activities are short-term (even daily) functions, such as inventory control and cash management, required to satisfy the specified corporate objective(s) in accordance with tactical and strategic plans.

Needless to say, whilst senior management decide strategy, middle management focus on tactics and line management exercise operational control. None of these functions are independent of the other. All occupy a pivotal position in the decision-making process and naturally require co-ordination at the highest level.

2.3 Exercise 2.2: Financial Strategy and Working Capital

We have observed financial strategy as the area of managerial policy that determines *macro* investment and financial decisions, both of which are preconditions for shareholder wealth maximisation. However, each decision can then be subdivided into two broad categories to satisfy a company's mission statement; longer term (strategic or tactical) and short-term (operational). The former is the province of capital budgeting (ideally based on ENPV analysis). The latter relates to working capital management. But obviously the two must be co-ordinated to satisfy the firm's overall objective(s).

Required:

1. Outline the contrasting features of capital budgeting and working capital management.
2. Explain how working capital fits into project appraisal using ENPV analysis.

I will then provide a Chapter summary.

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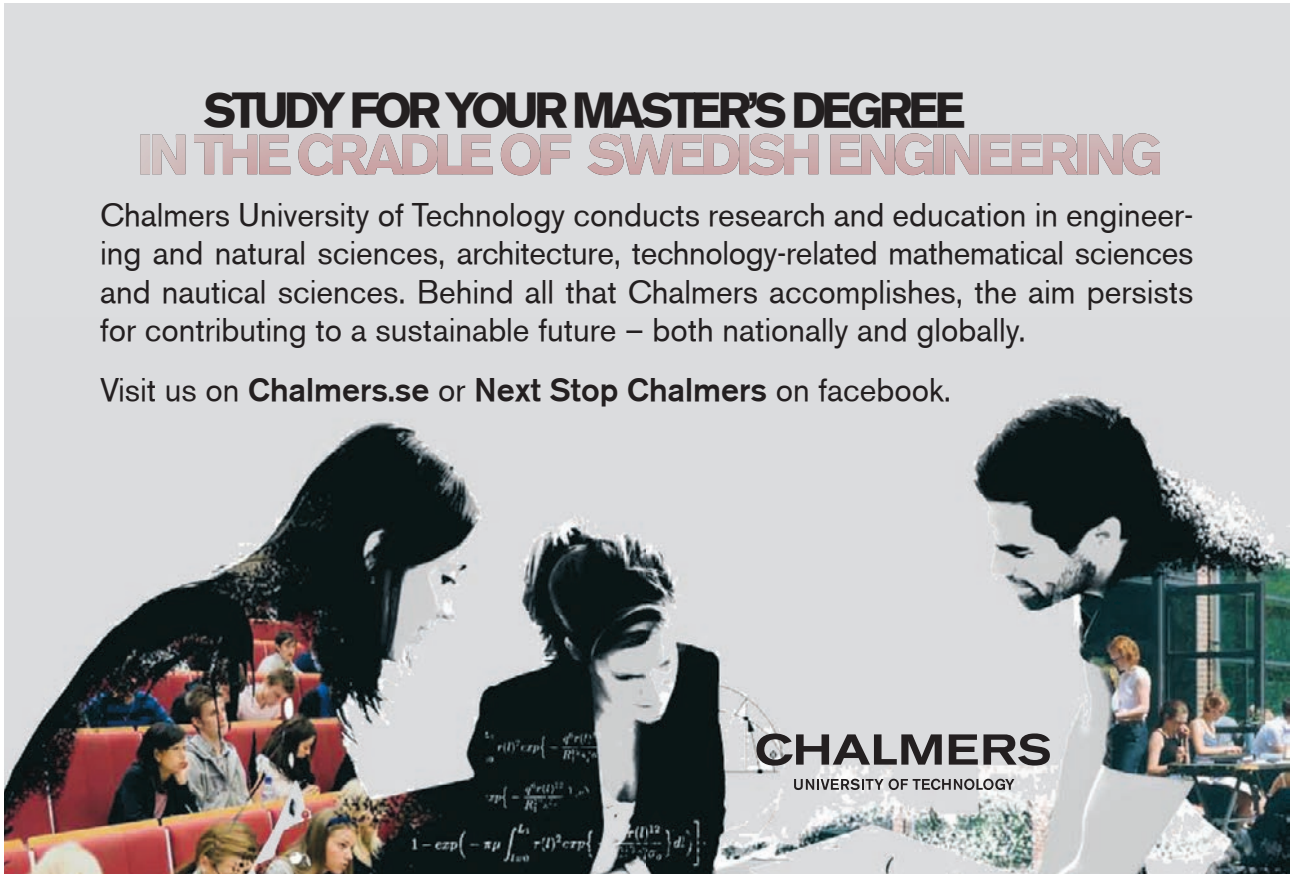
An Indicative Outline Solution

1. Capital budgeting decisions are typically *strategic*, large scale and long-term, which may also be unique. Investment involves significant fixed asset expenditure but uncertain future gains. Financial prudence dictates the use of long-term sources of finance wherever possible, to ensure a project's liquidity before profits come on stream. Without sophisticated periodic forecasts of required outlays and associated returns that model the *time value of money* and an allowance for risk, the subsequent penalty for error can be severe. The decision itself may be irreversible, resulting in corporate failure.

   Conversely, working capital management is *operational*. Investment decisions are short term, (measured in months rather than years) repetitious and divisible. So much so, that sometimes, current assets (notably inventory) may be acquired piecemeal. Such divisibility has the advantage that the average investment in current assets can be minimised, thereby reducing its associated costs and risk.

   Unlike fixed asset formation, working capital investment may be supported by the long *and* short ends of the capital market. A proportion of, finance can therefore be acquired piecemeal, which provides greater scope for the minimisation of capital costs associated with current asset investments.



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Costs and returns are usually quantifiable from existing data with any weakness in forecasting easily remedied. Decisions themselves may be reversible, without any loss of goodwill.

2. Conventional accounting wisdom dictates that the more current assets "cover" current liabilities (particularly cash or near cash, rather than inventory) the more *solvent* the company. In other words, the greater the degree to which it can meet its short term obligations as they fall due.

   From an *internal* financial management stance, however, these interpretations 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 disparities between the cash inflows and 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 precautionary 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 ENPV 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*).

2.4 Summary and Conclusions

Despite the differences arising from the time horizons of capital budgeting and working capital management, 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 a corporate share price.

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Irrespective of the time horizon, the investment and financial decision functions of financial management (including working capital) should always involve a continual:

- *Search* for investment opportunities, consistent with the firm's business strategy.
- *Selection* of the most profitable investment opportunities (in absolute ENPV terms).
- *Determination* of an optimal mix of internal and external funds (long or short) that finances those opportunities.
- *Application* of a system of budgetary controls, using variance analysis, to govern the acquisition and disposition of funds.
- *Analyses* of financial result, using performance indicators as a guide to future investment.

None of these functions are independent of the other. All occupy a pivotal position in the decision-making process and naturally require co-ordination at the highest level.

2.5 Selected References

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Text Books:

Working Capital and Strategic Debtor Management, 2013.

Business Texts:

Working Capital Management: Theory and Strategy, 2013.
Strategic Debtor Management and the Terms of Sale, 2013.

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3 The Accounting Concept of Working Capital Management: A Critique

3.1 Introduction

All companies require working capital. But the actual amount will depend on many economic factors that may be *unique* to each. Certainly, there is no *standard* requirement that firms should maintain solvency and liquidity ratios of 2:1 and 1:1 respectively. Think manufacturing relative to retailing, or even different types of retailing. All we can say financially is that for a given level of activity, an optimum level of investment is budgeted for.

For example, consider a trading company that receives all customer orders for *cash*, (say over the Internet). Having added a mark-up, it then purchases these items at cost from a wholesaler on *credit* using "just in time" (JIT) inventory control techniques. The company need hold no current assets, apart from periodic cash balances to satisfy its supplier's invoices when they fall due. From a Balance Sheet perspective, the company's total current liabilities may far exceed its current assets. Yet, contrary to accounting convention, at no point in time is it *technically insolvent*.

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As we illustrated in Chapter One, this simple example "benchmarks" an *ideal* relationship between a particular firm's short-term *operating* (investment) and *financing* (funds) cycles as a guide to efficient working capital management. To extend the analogy:

> Whether a company "trades" or "manufactures", buys and sells on a cash or credit basis, it should only hold *minimum* levels of inventory, debtors and precautionary cash balances to meet anticipated demand and satisfy its future debt paying ability. Hopefully, this is defined by the following inequality.
>
> Operating cycles (conversion of raw material to cash) < Financing cycles (creditor turnover)

The question now is how to define this inequality more precisely, given a company's attitude towards risk under conditions of uncertainty.

3.2 Exercise 3.1: Working Capital Investment and Risk

Efficient working capital management is determined by an *optimal* trade-off between liquidity and profitability to create wealth. Inefficient management ties up finance in excess or idle current assets, which not only reduces liquidity but also limits investment in long term assets and therefore future profitability. Following this line of logic we have observed that a company's working capital policy should therefore be a function of two inter-related decisions.

- *Investment*, which identifies and selects a *minimum* (optimum) portfolio mix of current assets for a predetermined level of uncertain future demand.
- *Finance*, which identifies potential fund sources (equity and debt, long or short) required to sustain investments and the *risk-adjusted* return expected by each. An optimum combination is then selected to *minimise* the overall cost of borrowing, defined by the weighted average cost of capital (WACC).

Leaving aside the finance decision until the next Exercise, let us focus on the structure of current asset investment. Under conditions of uncertainty, *all* companies must hold minimum levels of inventory and cash, including precautionary balances to satisfy variations in demand. For creditor firms, the level of debtors (accounts receivable) will also be dictated by their terms of sale. But how do *individual* company attitudes towards risk determine these policy variables?

Required:

Given different attitudes towards risk (preference, aversion and neutrality) compare and contrast a company's investment in current assets

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An Indicative Outline Solution

From a corporate policy perspective, we can define risk preference, aversion and neutrality in terms of *aggression*, *conservatism and moderation*.

An *aggressive* working capital policy is characterised by minimal levels of inventory and precautionary cash balances. Such a policy would minimise costs. However, it could inhibit sales and hence anticipated revenue and returns because the company might not be able to respond to fluctuations in demand.

Conversely, a *conservative* policy requires higher levels of inventory and cash to counteract risk. So, it may generate lower expected returns than an aggressive strategy.

A *moderate* working capital policy (neutrality) obviously resides somewhere between risk preference and aversion, relative to the expected returns it delivers.

Perhaps you have noticed that so far nothing has been said about debtor (account receivables) policies. This is because there is a fundamental difference between the previous treatment of inventory and cash balances and the level of debtors, which further explains why the latter underpinned by a company's "terms of sale" determine the efficient management of working capital management.

For example, conservative, high levels of stock and cash imply security. But there is no such thing as a "secure" level of debtors. A high level of debtors could mean that a company has relaxed its terms of sale without any increase in demand. Alternatively, its collection procedures may have become more ineffectual.

Whatever the truth of the matter, to summarise our position so far:

> If we characterise an aggressive working capital policy as risky, then a *reduction* in inventory and cash balances would be aggressive but an *increase* in the level of debtors would also be aggressive.

3.3 Exercise 3.2: Working Capital Finance and Risk

> The conventional concept of working capital is defined as an *excess* of current assets over current liabilities. 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.

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Yet we all know that in reality, 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.

The *efficient* financing of working capital therefore depends upon how the funding of fixed and current asset investment is divided between an *optimum* mix of long and short term sources, bearing in mind that under conditions of uncertainty, short-term capital costs are typically lower than long-term capital costs.

And this is where the company's attitude to risk comes into play.

Without getting enmeshed in the intricacies of how the accounting transactions are recorded, or the defects of conventional Balance Sheet analysis, (which are explained in Chapter Three of my bookboon Theory and Business companion texts):

Consider three companies with the following identical asset structures ($million):

Fixed Assets **280**; Permanent Current Assets **110**; Variable Current Assets **90**

Where:

Permanent current assets represent their "core" investment in inventory, debtors and cash.

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Variable current assets represent their average level of investment to satisfy fluctuations in anticipated demand.

The division between their *total* current assets and fixed assets is not unrealistic. In the real world, the ratio is often in the region of 1:1.The only difference between the three companies relates to their attitude to *financial* risk, characterised by preference, aversion and neutrality. In other words, they adopt aggressive, conservative and moderate financing policies respectively, to fund their total asset investment.

Required:

Using numerical examples of your choice within a Balance Sheet framework, where total fund sources (long and short) equal their total use, defined by the asset structure above:

1. Compare and contrast how the division between long-term finance and short term finance differs between the three companies, given their differential attitude towards risk.
2. Confirm your commentary with a summary of their working capital (current asset) ratios.

An Indicative Outline Solution

The financing of working capital relates to how fixed asset formation and current asset investment is divided between long-term and short-term sources of funding. Depending on corporate attitudes to financial risk (preference, aversion and neutrality) three broad policies exist; aggressive, conservative and moderate.

Table 3.1 presents a hypothetical data series in a convenient Balance Sheet format for our three companies, which reflects their financial risk profiles as a basis for analysis.

$ million	**Company 1 (Aggressive)**		**Company 2 (Conservative)**		**Company 3 (Moderate)**	
Investment						
Fixed		280		280		280
Current						
Permanent	110		110		110	
Variable	90		90		90	
		200		200		200
Total		480		480		480
Finance						
Long-term		240		420		390
Short-term		240		60		90
Total		480		480		480

Table 3.1: Comparative Financing Policies

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1. The division between long and short term finance

With an *aggressive* financing policy, Company 1 not only funds its *core* working capital investment and all fluctuations in *variable* current assets, but also a proportion of its fixed assets formation, ($20m) with *short-term* finance.

This policy is designed to provide the highest expected return (because the costs of short-term funds are typically lower than long-term costs in efficient capital markets). But it is also very risky, arising from its illiquidity and the threat of insolvency. Short-term financing may have to be repaid before periodic revenues are realised.

With a *conservative* policy, Company 2 reverses the logic of Company 1. Risk averse management now prefers long-term financing (equity and debt) that exceeds its fixed asset and permanent current asset base. Short-term financing is only used to fund part of the fluctuation in current assets ($60m).

This policy is supposedly less risky. But it also results in lower returns, because of the higher yields required by the higher proportion of long-term equity and debt-holders in its capital structure.

With a *moderate* policy, Company 3 falls between the two extremes. It *equates* short-term finance to the fluctuation in current assets ($90m). Long-term sources, therefore, finance fixed asset investment, plus the permanent component of current assets.

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2. The working capital (current asset) ratios.

A comparison of the current asset to current liability ratios for the three companies ($ million) reveals their disparate working capital positions.

Company 1 (200/240) = 0.83:1 **Company 2** (200/60) = 3.3:1 **Company 3** (200/90) = 2.2:1

Company 1 appears *theoretically* insolvent compared to the traditional current asset "benchmark" of 2:1 (with which you are familiar). Even without knowledge of the composition of its current assets (inventory, debtors and cash) it is also illiquid, compared to the conventional "quick" asset ratio of 1:1.

At the other extreme, Company 2 is awash with current assets relative to its short-term finance. Accounting concepts of solvency and liquidity criteria are well satisfied. But this may be at the expense of the higher level of profitability sought by Company 1.

Between these polar extremes, Company 3 satisfies working capital conventions, with a risk-return trade-off to ensure adequate performance.

3.4 Summary and Conclusions

Having illustrated different working capital policies, relative to the corporate investment and finance decision within the context of a *static* Balance Sheet framework, the next question we need to consider is whether it is possible to define an *optimum* 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 quickly to *future* economic conditions and increase sales, without compromising debt paying ability.

Two policies spring to mind, mentioned in Chapter Three of the "Theory" and "Business" companion texts to this study. One is *strategic* and the other is *operational*, although they need not necessarily be *mutually exclusive*.

- *Reduce* short-term assets (rather than borrow) and reinvest the proceeds in fixed assets to meet a forecast increase in *long-term* output capacity.
- *Reduce* liquidity temporarily and invest in inventory to satisfy a *short-term* increase in demand.

However, as we shall discover from the next Chapter's case study, these decisions require a *dynamic* analysis of the firm's "operating" and "financing" cycles, based on its debtor (accounts receivable) policy and the "terms of sale" dictated by its creditors (accounts payable). Otherwise, management's actions may be tantamount to economic suicide.

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3.5 Selected References

Hill, R.A., bookboon.com.

Text Books:

Working Capital and Strategic Debtor Management, 2013.

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Working Capital Management: Theory and Strategy, 2013.
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4 The Working Capital Cycle and Operating Efficiency

4.1 Introduction

Like the Activities in both texts of my bookboon working capital series, some Exercises have focused on accounting transactions and their interpretation using *externa*l financial reports. Others have required a more literary, theoretical approach from an *internal* managerial perspective. To vary the pace and style of analysis, this Chapter combines the two with an expanded Case Study based on a true story. It complements the Review Activity contained in Chapter Three of the companion books and is structured to reinforce our developing critique of the subject.

4.2 The Case Study: An Introduction

From the outset, we have observed that for a given level of sales using financially efficient *time value of money* criteria:

- Accounts receivable (from debtors) should be *collected* as soon as possible.
- Conversely, accounts payable (to suppliers) should be *delayed* as long as possible.

Of course, this approach to working capital management may be an oversimplification because of its goodwill implications. The former ignores the fact that a reduction in the period of credit granted to customers may cause the company's clientele to look elsewhere, thereby reducing future sales. Likewise, an increase in the creditor payment period offered to suppliers may cause them to cease trading with the company altogether, thereby interrupting the whole production process.

On the other hand, as we shall now discover, subject to two constraints, these policies conveniently "benchmark" the normative wealth maximisation objective of efficient working capital management mentioned earlier:

> To *minimise* current assets and *maximise* current liabilities based on a company's "terms of trade" without compromising its *future profitability* and *debt paying ability*.

When I was at university, an extremely intelligent friend of mine bored with his studies decided to leave our course part way through the second year (despite every lecturers' attempts to convince him otherwise). The next time we met, he had just set himself up in business.

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The financial details were as follows:

- On January 1st he signed an open-ended monthly agreement to purchase imperfect shoes from a local manufacturer for £10,000 on three months credit.
- He then occupied part of his sister's market stall in the city centre (who sold second-hand designer clothes) for two days a week, free of charge.
- At the end of each month he hoped to sell everything at a 50% mark-up (well below High Street prices) cash up front.

Required:

Using the information available, prepare *forecast* beginning and end of month Balance Sheets to April 1st to evaluate the financial wisdom of my friend's decision to leave his degree course and go into business At this stage in our analysis there is no need to use ratio analysis.

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An Indicative Outline Solution

The forecast sequence of beginning and end of month Balance Sheets to April 1st presented in Table 4.1 reveals that the business is extremely profitable, solvent and liquid. So much so, that as I have also illustrated, it would be awash with cash by the following January. But as we now know from the previous Chapter's Exercises, the burgeoning working capital structure is far *too conservative* and *grossly inefficient*, from both an investment and financing perspective.

Using creditors, rather than your own money (or borrowing) to fund a business start-up is financially desirable. But once the venture is up and running, *idle cash is unprofitable cash*. If my friend's business objective was to make as much money (cash profit) as possible (what we formally term wealth maximisation) then as mentioned earlier:

> Any profit-maximising enterprise should strive to minimise current assets and maximise current liabilities compatible with its future profitability and debt paying ability.

Two options therefore confronted my friend, which are not necessarily *mutually exclusive*.

- *Withdraw* the maximum proportion of periodic cash balances and enjoy the proceeds.
- *Reinvest* the maximum proportion of periodic cash balances and diversify the business.

	January 1st		(£)		**January 31st**		
Creditors	10,000	Stock	10,000	Profit	5,000	Cash Balance	15,000
				Creditors	10,000		
					15,000		15,000
	February 1st				**February 28th**		
Profit	5,000	Stock	10,000	Profit	10,000	Cash Balance	30,000
Creditors	20,000	Cash Balance	15,000	Creditors	20,000		
	25,000		25,000		30,000		30,000
	March 1st				**March 31st**		
Profit	10,000	Stock	10,000	Profit	15,000	Cash Balance	45,000
Creditors	30,000	Cash Balance	30,000	Creditors	30,000		
	40,000		40,000		45,000		45,000
	April 1st				**Next January 1st**		
Profit	15,000	Stock	10,000	Profit	60,000	Stock	10,000
Creditors	30,000	Cash Balance	35,000	Creditors	30,000	Cash Balance	80,000
	45,000		45,000		90,000		90,000

Table 4.1: Forecast Statements of Monthly Financial Position

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4.3 The Case Study: The Analysis

Having signed the agreement on January 1st to purchase £10,000 stock monthly on three months credit, my friend did sell everything on the market by the end of each month for cash at a 50 per cent mark-up. So, if he was so clever, did he let the money lie idle?

Of course not, nor were the proceeds withdrawn. As any economist will tell you, once *one* profit-maximising opportunity exhausts itself, you should search for *another* and diversify your operations.

My friend thought "buy to let" property represented a sound investment. So, from each month's revenue throughout the first year, he committed all maximum *free cash inflow* to purchasing and refurbishing a small flat in the student quarter of the city. By the end of the following January, the property was rented to students he knew from his old degree course who also frequented the market stall. Thereafter, his grand design was to acquire further properties from his increasing stock of wealth. Just like a game of Monopoly!

Required:

1. Prepare the *actual* beginning and end of month Balance Sheets to April 1st and for January 1st of the following year as a basis for analysis (assuming that periodic *free cash inflow* is invested in property at the beginning of the following month).

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2. Calculate the sequential ratios for *profitability* (the return, profit margin and asset utilisation), *working capital* (solvency and liquidity) to April 1st and the corresponding ratios for January 1st of the following year, plus the venture's *operating* and *financing* cycles, expressed in monthly terms based on its "terms of trade".
3. Provide a commentary that interprets all the information contained in the two data sets.

An Indicative Outline Solution

1. The Balance Sheets

	January 1st			(£)			**January 31st**	
Creditors	10,000	Stock	10,000		Profit	5,000	Cash Balance	15,000
					Creditors	10,000		
						15,000		15,000
	February 1st						**February 28th**	
Profit	5,000	Fixed Assets	15,000		Profit	10,000	Fixed Assets	15,000
Creditors	20,000	Stocks	10,000		Creditors	20,000	Cash Balance	15,000
	25,000		25,000			30,000		30,000
	March 1st						**March 31st**	
Profit	10,000	Fixed Assets	30,000		Profit	15,000	Fixed Assets	30,000
Creditors	30,000	Stocks	10,000		Creditors	30,000	Cash Balance	15,000
	40,000		40,000			45,000		45,000
	April 1st						**Next January 1st**	
Profit	15,000	Fixed Assets	35,000		Profit	60,000	Fixed Assets	80,000
Creditors	30,000	Stocks	10,000		Creditors	30,000	Stocks	10,000
	45,000		45,000			90,000		90,000

Table 4.2: Actual Statements of Monthly Financial Position

2. The Ratios

Table 4.2 can be reformulated using a selection of financial ratios within a coherent framework as a basis for interpretation.

If you are in any doubt about financial ratio analysis, or the derivation of a data set such as Table 4.3) please refer back to Chapter Three of either "Working Capital and Strategic Debtor Management", or "Working Capital Management: Theory and Strategy"(2013) from my bookboon series, for guidance.

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	January		February		March		April	January (Next)
	1st	31st	1st	28th	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	-	-
Operating Cycle								
Stock Turnover (months)							1	1
Financing Cycle								
Creditor Turnover (months)							3	3

Table 4.3: The Financial Ratios

3. The Data Set Commentary.

Table 4.3 summarises my friend's progress throughout the first year by referencing:

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

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Rather than let cash lie idle (or pay creditors early) he maximised his reinvestment potential by diversification to increase future profits without compromising debt paying ability. But a *conventional* interpretation of the Balance Sheets using ratio analysis fails to reflect the underlying *economic reality* of this business strategy.

Whilst the profit margin remains unchanged, sales to assets and hence the return on assets fluctuate during the first quarter, thereafter rising to the year end, even though the terms of trade are *constant*. Moreover, the business is definitely more profitable in *absolute* terms by the 1st March compared to the 31st January, although the return *percentage* remains the same. Consequently, apart from the profit margin, conventional ratio analysis suggests significant variations in efficiency (quite wrongly) depending upon when the Balance Sheet is "struck".

Equally worrying from a traditional Accounting perspective are the *dynamics* of working capital. After three months, the solvency and liquidity ratios fall to 1:3 and zero respectively, contravening the current asset conventions of 2:1 and 1:1. However, the decline in working capital is a consequence of a build up of creditors and an efficient transformation of cash into fixed assets. By February, working capital is therefore negative and liquidity has evaporated. But the business venture is neither insolvent, nor illiquid, unless my friend was to cease trading altogether.

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Given the terms of trade (three months credit relative to one month's cash sales) the business can meet its financial obligations when they fall due (from April onwards). The only constraint is that having reinvested £15,000 in property from January and February respectively, only £5,000 can be reinvested from March onwards on a monthly basis. Otherwise, creditors would be knocking on the door.

Finally, it is no accident that the relationship between current assets and current liabilities stabilises at 1:3 by the end of the first quarter. Nor, is this a cause for concern. *Stock turnover* (the conversion of assets to cash) termed the *operating cycle* is one month. *Creditor turnover* (the repayment period granted by suppliers) termed the *financing cycle* is three months. In other words, inventory is converted into cash three times quicker than debts need legitimately to be repaid.

So, within the context of efficient financial management, did my friend perform well?

4.4 Summary and Conclusions

This Chapter's Case Study vividly illustrates that if a firm's over-arching objective is a combination of investment and financing decisions that generate *maximum* net cash inflows at *minimum* cost, it follows that:

- The efficient management of working capital should be determined by an *optimum* investment in current assets and current liabilities, dictated by its "terms of trade".
- The accounting convention that firms should strive to maintain a 2:1 working capital ratio underpinned by a liquidity ratio of 1:1 may be *sub-optimal* and misleading.
- Management's objective should be to *maximise* current liabilities and *minimise* current assets compatible with their *debt paying ability*, based upon *future cash profitability*.

In an ideal world all firms would prefer to hold no inventory, sell everything for cash on delivery (COD) rather than credit and not leave the balance lying idle. Conversely, they would prefer to purchase all stocks on credit. As a consequence, they would hold no current assets but finance their reinvestment activities through suppliers.

Given these criteria, checks and balances, my friend did perform well. So much so, that today in the UK, he is a household name leading a large organisation with corporate status!

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4.5 Selected References

Hill, R.A., bookboon.com.

Text Book:

Working Capital and Strategic Debtor Management, 2013.

Business Text:

Working Capital Management: Theory and Strategy, 2013.

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5 Real World Considerations and the Credit Related Funds System

5.1 Introduction

Before concluding our study of working capital and moving on to Part Three and the role of strategic debtor investment, let us summarise our position so far.

In an ideal world, all firms would prefer to hold no inventory, sell everything for cash and not leave the balance lying idle. Conversely, they would prefer to purchase all stocks on credit. As a consequence, they would hold no current assets but finance their reinvestment activities by maximising current liabilities, subject to no loss of goodwill.

In the real world, these options are obviously the *exception rather than the rule*, given the extent to which most firms buy and sell on credit and "manufacture" their products. An increase in the creditor payment period offered to suppliers may cause them to cease trading with the company altogether, thereby interrupting the whole production process. Likewise, a reduction in the period of credit granted to customers may cause the company's clientele to look elsewhere, thereby reducing future sales and profitability.

Nevertheless, whilst these "barriers to trade" may prohibit an *ideal* relationship between the two, companies should still strive to *minimise* current assets and *maximise* current liabilities. As a consequence, within the context of normative wealth maximisation, we can still define the *efficient* objectives of working capital management as follows.

- The determination of optimum (*minimum*) inventory, debtor and cash investments.
- The acquisition of an optimum (*maximum*) level of creditor finance, subject to a firm's future profitability and debt-paying ability.

Assuming no loss of customer or supplier goodwill, the inflow of cash will then be maximised at minimum cost, satisfying the overall NPV criteria of financial management.

5.2 Exercise 5: Real World Solvency and Liquidity

Over the past decade, the Pixie Company has expanded its activities by the profitable reinvestment of retained earnings. But despite a significant increase in turnover and a history of Balance Sheet solvency; it is now beset by liquidity problems.

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The CEO Mr. Francis has convened a Board meeting to establish what is wrong with its working capital position. The following "snapshot" data taken from the company accounts has been itemised as a basis for discussion.

($million)	Last Year	This Year
Raw materials	200	270
Work in progress	140	180
Finished goods	160	240
Debtors	320	480
Creditors	160	195
Sales	1,600	2,000
Purchases	960	1,300
Cost of goods sold	1,400	1,800

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Required:

1. Reformulate the data, using ratio analysis and the derivation of the company's operating and financing cycles to interpret any possible "mismanagement" of working capital.
2. Having studied Chapter Five of either core text of the bookboon series (referenced at the end of this Chapter); critically evaluate alternative *strategic* options for how the company's future liquidity position might be improved.
3. Summarise your conclusions.

An Indicative Outline Solution

1. The Data Reformulation

Although we have no information concerning cash balances (presumably because of the company's reinvestment policy) the original data set itemises the working capital components for what is a "manufacturing" company, which also buys and sells on credit (a creditor firm).

Based upon the normative, wealth maximising objective of financial management (subject to future profitability, debt paying ability and neither a loss of supplier or customer goodwill) working capital *efficiency* requires the Pixie Company to:

- *Minimise* current assets, comprising raw materials, work in progress, finished goods and debtors, which define the firm's operating cycle.
- *Maximise* creditors (the financing cycle).

If we reformulate the data in terms of accounting ratios and derive the relationship between the operating and financing cycles, it becomes obvious why the firm is experiencing liquidity problems, even though it is extremely solvent.

Turnover Ratios (days)	**Last Year**	**This year**
RM	76	76
WIP	37	37
FG	42	49
Stocks	155	162
Drs	73	87
Operating Cycle	228	249
Financing Cycle (Crs)	61	55
Net Operating Cycle (Shortfall)	167	194
Current Assets / Current Liabilities	5:1	6:1

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The company's management is schizophrenic. Despite (or perhaps because of) an *aggressive* policy of fixed asset reinvestment funded by maximum retention; the table reveals all the features of an extremely *conservative* working capital policy (with which you should be familiar from the Exercises contained in Chapter Three).

The Pixie Company's conversion of raw materials to the eventual receipt of cash from debtors (*the operating cycle*) not only exceeds the supplier credit period (*the financing cycle*) by a massive margin, but it has also widened year on year. So much so, that its "credit related fund system" defined by the *net operating cycle* has risen from 167 to 194 days. Thus, current assets far exceed current liabilities, with the working capital ratio rising one year to the next (5:1 to 6:1).

All of which is bad news for the company, unless it is extremely *risk averse*, (which is not supported by its approach to fixed asset formation).

2. The Strategic Options

Without the retention of "precautionary" cash balances from previous sales to finance current working capital (which presumably would compromise the company's long-term investment policy and may be impossible to unscramble) only two other *strategic* options are available to support the systematic funding of future production.

1. Increase the price of goods and services.
2. Seek external finance.

Unfortunately, both these remedies may also be worse than the original disease. The former might reduce demand. The latter will incur eventual capital repayments and periodic interest charges. A combination of the two could therefore reduce turnover and future cash profitability dramatically, with catastrophic consequences for liquidity.

5.3 Summary and Conclusions

Pricing policy and external finance should only fund working capital if corporate management already has *optimum* stock, debtor and creditor policies in place.

With regard to Pixie, the levels of inventory that comprise the "production process" are reasonably *stable*. However, the *volatile* "terms of trade" which define the balance of the company's *net operating cycle* provide cause for concern.

The fact that over the two years, debtors are taking 73 and 87 days to pay (compared with creditor turnover ratios of 61 and 55 days) suggests that whilst the period of credit offered by suppliers has tightened, the longer period of credit taken by customers is the root cause of the company's liquidity problem. When you consider that any *turnover* ratio is an *average*, many customers must be remitting payment well beyond 87 days

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Before refinancing fixed asset investment from external sources (the capital market), re-negotiating its supplier credit terms, or toying with inventory control and cash budgeting requirements, Pixie's CEO is therefore advised to focus initially on the company's own customer terms of sale.

As we shall discover, when we return to this company in Part Three (Exercise 6.4):

> For most firm's, it is their debtor policy and specifically the inter-relationship between its terms of sale and the eventual receipt of cash (the credit related funds system) which are the prime determinants of its overall investment-financing strategy and the efficient management of working capital.

5.4 Selected References

Hill, R.A., bookboon.com.

Text Book:

Working Capital and Strategic Debtor Management, 2013.

Business Text:

Working Capital Management: Theory and Strategy, 2013.

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Part Three:
Strategic Debtor Investment

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6 The Effective Credit Price and Decision to Discount

6.1 Introduction

For your convenience let us begin with a resumé.

Part One presented a detailed explanation of the over-arching definition of the normative objective of strategic financial management, namely the maximisation of expected net cash inflows at minimum cost (the ENPV decision rule) from a working capital perspective.

Part Two, then provided a series of Exercises, focussing on differences between the *dynamic* wealth maximising implications for *internal* working capital management and an *external* interpretation of a firm's *static* working capital position, revealed by its published accounts.

Part Three now develops another critique within this context, underpinned by my bookboon series on working capital. This relates to the pivotal role of a creditor company's "terms of sale" as a determinant of its overall working capital efficiency. It also departs from accounting convention, based on the intricacies of recording transactions and the details of financial reporting, by introducing the need for mathematical modelling.

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If you require guidance on the following sequence of Exercises, I recommend that before embarking on Part Three, you refer to either:

> Chapter Six or Chapter Two of the appropriate texts with which you are familiar: "Working Capital and Strategic Debtor Management" or "Strategic Debtor Management and Terms of Sale" respectively.

There you will discover that the efficient working capital management is not only determined by an *optimum* investment in current assets and current liabilities, which rejects traditional solvency and liquidity ratios of 2:1 and 1:1.But, given the extent to which most firms sell on credit to increase their turnover:

> Many practicing financial managers not only fail to model the dynamics of their company's *overall* working capital structure satisfactorily. They also misinterpret the functional inter-relationships between its *components*.

Contrary to the balance of academic literature on the subject (which focuses on cash management and inventory control as the key to success):

- The prime determinant of working capital efficiency should relate to accounts receivable (debtor) policy, which is a function of a company's *optimum* terms of sale to discounting and non-discounting customers. This might also be unique and need not conform to industry "norms".
- Variations in the cash discount, discount period and credit period all represent dynamic *marketing* tools.
- Based upon the time value of money and opportunity cost concepts, the terms of sale create purchasing power for customers, which should enhance demand for the creditor firm, increase turnover and hopefully net profits from revenues.

> Optimum terms of sale not only determine a company's optimum investment in debtors but as a consequence its *optimum* investments in inventory, cash and creditors, which in total define the structure of current assets and liabilities and therefore overall working capital requirements.

6.2 Exercise 6.1: Terms of Sale: A Theoretical Overview

We have assumed that companies wishing to maximise shareholder wealth using ENPV techniques within the context of project appraisal should:

- *Maximise* current liabilities and *minimise* current assets compatible with their *debt paying ability*, based upon *future cash profitability* determined by its *terms of sale,*
- *Optimise* terms of sale to determine *optimum* working capital balances for inventory, debtors, cash and creditors.

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However, this presupposes that management can initially model the differential impact of their credit terms on future costs, revenues and hence profits when formulating an optimum debtor policy.

So, let us begin our analysis based on your reading of either Chapter from the bookboon companion texts referenced earlier, or Exercise 1 contained in Chapter One of this study:

Required:

Summarise how the "terms of sale" mathematics (represented by cash discount, discount period and credit period variables) underpin the demand for a firm's goods and services within a framework of *effective* prices.

An Indicative Outline Solution

Using the common Equation numbering from whichever bookboon reference you have sourced, the following mathematical framework can be derived to determine optimal credit policies.

The incremental gains and losses associated with a creditor firm's terms of sale are evaluated within a framework of "effective" prices based on the *time value of money*. These define the customers' *credit price* (P') and *discount price* (P") associated with "effective" price reductions arising from delaying payment over the credit or discount period, respectively.

$$(9) \qquad P' = P\left(1 - \frac{rT}{365}\right)$$

$$(11) \qquad P'' = P\left[(1-c) - \frac{rt}{365}(1 - c)\right]$$

Where buyers of a firm's product at a *cash* price (P) are offered terms of (c/t:T) such as (2/10:30):

(c) = the cash discount (2%)
(t) = the discount period (10 days)
(T) = the credit period (30 days)

Because (P') differs from (P") it is then possible to analyse how the introduction of any cash discount into a firm's period of credit influences the demand for its product and working capital requirements. When formulating credit policy, management must therefore consider the *division of sales* between discounting and non-discounting customers.

For any combination of credit policy variables, the buyer's decision to discount depends upon the *cost* of not taking it exceeding the *benefit*.

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The *annual benefit* of trade credit is defined by the customer's *annual opportunity cost* of capital rate (r). Because non-discounting customers delay payment by (T-t) days and forego a percentage (c), their *annual cost of trade credit* (k) can be represented by:

$$(12)\quad k = \frac{365}{(T - t)}\, c$$

Thus, if purchases are financed by borrowing at an opportunity rate (r) that is *less* than the annual cost of trade credit (k) so that:

$$(13)\quad r < k = \frac{365}{(T - t)}\, c$$

The buyer will logically take the discount.

From the *seller's* perspective, we can now confirm that:

To increase the demand for its products, a firm should design its credit periods to entice low effective price (*high* opportunity rate) buyers, whereas the cash discounts should be utilised to provide a lower cash price for those customers with *low* opportunity rates.

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To summarise: with a COD price (P) on terms (c/t: T) and a customer opportunity rate (r), the *effective* price framework and discount decision can be expressed mathematically as follows:

Price	COD (P)	Credit Price (P')	Discount Price (P")
	P	P [1-(rT/ 365)]	P [(1-c) - (r t / 365) (1-c)]
Decision			
r < k = 365c / (T-t)		P' > P" < P	Take the discount
r > k = 365c / (T-t)		Opt for the credit period	P' < P" < P

In an ideal world all firms would prefer to hold no inventory, sell everything for cash and not leave the balance lying idle. Conversely, they would prefer to purchase all stocks on credit. As a consequence, they would hold no current assets but finance their reinvestment activities by maximising current liabilities, subject to no loss of goodwill.

In the real world these options are obviously the *exception rather than the rule*, given the extent to which most firms buy and sell on credit and "manufacture" their products. An increase in the creditor payment period offered to suppliers may cause them to cease trading with the company, thereby interrupting the whole production process. Likewise, a reduction in the period of credit granted to customers may cause the company's clientele to look elsewhere, thereby reducing future sales.

Nevertheless, whilst these "barriers to trade" may prohibit an *ideal* relationship between the two, companies should still strive to *minimise* current assets and *maximise* current liabilities. As a consequence, within the context of normative wealth maximisation, we can still define the *efficient* objectives of working capital management as follows.

- The determination of optimum (*minimum*) inventory, debtor and cash investments.
- The acquisition of an optimum (*maximum*) level of creditor finance, subject to a firm's future profitability and debt-paying ability.

Assuming no loss of customer or supplier goodwill, the inflow of cash will then be maximised at minimum cost, satisfying the overall NPV criteria of financial management.

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6.3 Exercise 6.2: The Decision to Discount

Let us begin to apply the terms of sale mathematics and logic outlined in Exercise 1 with reference to the Slash Music Company. It is considering the launch of self-tuning guitars that cost £1,000 to manufacture at a mark-up of £150. For the first time, they intend to offer prospective wholesalers credit of (2/10:30) rather than their usual cash on delivery (C.O.D.) terms.

Required:

Use the data (supported by your reading of either core text) to evaluate whether it is *rational* for customers to take the discount based on the Slash Company's *annual cost of trade credit* defined by Equation (13).

An Indicative Outline Solution

Optimum debtor policies defined by a company's terms of sale are determined by the division between its discounting and non-discounting customers.

With the information for the Slash Company, we can calculate the cash (C.O.D.) discount and credit prices *actually* paid, now or in the future, based on a uniform invoice price (P= £1,150)) and uniform terms of sale (c/t: T = 2/10: 30).

Price Options		
Now (C.O.D.)	Seven Days (Discount £23)	Thirty Days
£1,150:	£1,127:	£1,150

Obviously, no rational customer would pay COD today. They would opt for the lower discount price. Less obvious, is who chooses the credit period option. And this is where modelling the terms of sale, based on the *time value of money* concept, comes into play.

As we revealed in Exercise 6.1, the decision to discount should be based on the relationship between a creditor firm's annual cost of offering trade credit (k = 365c /T-t) and the customer's cost of borrowing from alternative sources to finance its purchases. This is measured by the customer's annual *opportunity* cost of capital rate (r).

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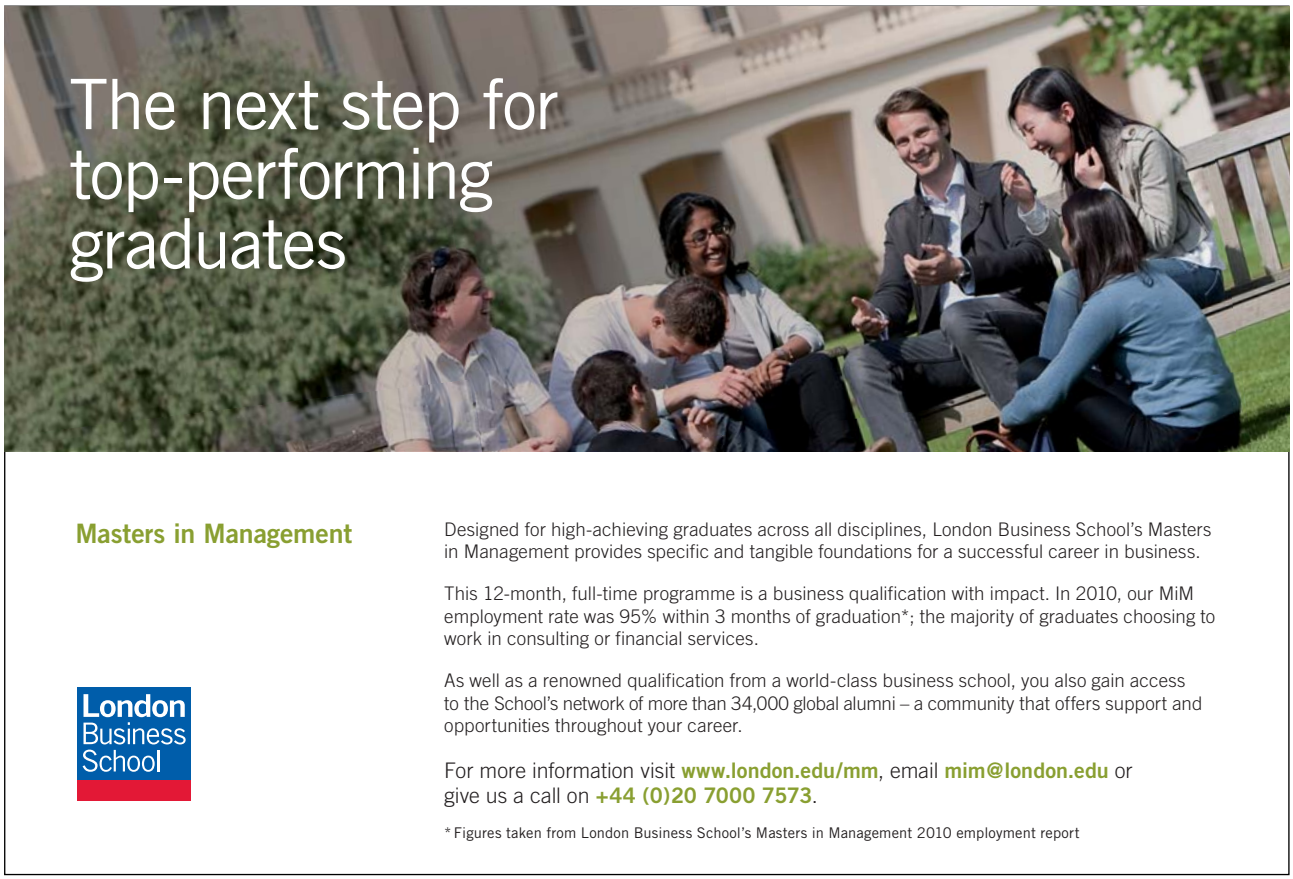
Since the annual cost of trade credit (k) represents the cost to the customer of *not taking the discount*, it follows that if the customer's opportunity borrowing rate:

$$r < k = 365c / (T\text{-}t) \text{ (they take the discount)}$$
$$r > k = 365c / (T\text{-}t) \text{ (they opt for the credit period)}$$
$$r = k = 365c / (T\text{-}t) \text{ (the discounting decision is irrelevant)}$$

Given the Exercise data, it should therefore be obvious why no rational customer in today's economic climate would opt for the credit period. As the following table illustrates, the prospective terms of sale offered by the Slash Company produce an annual cost of trade credit that far exceeds current "real world" opportunity cost of capital rates (alternative costs of borrowing) for any client with whom it intends to trade. So, all debtors take the discount

The Annual Cost of Trade Credit

$k = (365c / T\text{-}t) = \underline{36.5\%}$ [given (c/t:T) = (2/10: 30)]



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6.4 Exercise 6.3: The Effective Price Framework

The previous Exercise can also be formulated using the time value of money to validate the discounting decision for any class of customer within a framework of *effective* prices.

Required:

For a prospective clientele trading with the Slash Company whose annual opportunity cost of capital rate is 10 per cent, compared to a six per cent *norm* throughout the economy.

1. Calculate the credit *price* (P') and *discount price* (P") associated with the "effective" price reductions arising from delaying the cash payment (P) over the credit or discount period,
2. Briefly explain your results.
3. Comment on the consequences of substituting (2/10:30) credit terms for C.O.D. from the Slash Company's perspective

An Indicative Outline Solution

Given typical six per cent financing costs, companies with 10% opportunity rates would be classified as reasonably *high risk*, perhaps experiencing liquidity problems. You might think they should therefore forego the cash discount offered by the Slash Company over the shorter discount period, delay payment and opt for the much longer credit period. If so, you would be wrong, unless ineffectual debtor-control procedures by the manufacturer allowed the wholesaler to remit payment well beyond the legitimate terms of sale (and perhaps still take the discount).

Whilst this is a common practice when debtor companies are strapped for cash (explained in our companion texts and the following Exercise) for the moment let us simply assume that the company's clientele can borrow at 10 per cent and are also *ethical* and *rational*. Customers therefore adhere to the declared terms of sale (2/10: 30) compare the available effective prices and opt for the *lowest*.

1. The Effective Price Framework

Using Equation (13) from our referenced reading, the discounting decision based on a customer's annual opportunity cost of capital rate (r = 10%) relative to the *creditor* firm's annual cost of trade credit (k = 36.5%) reveals that:

$$r = 10\% < k = 36.5\% = 365c / (T-t) = 365x2 / (30-10)$$

So, all such wholesalers trading with the Slash Company would logically take the discount.

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We now need to confirm whether the decision to discount for a *high risk* customer with an annual 10 per cent opportunity cost of borrowing in excess of the *norm*, is validated by the *effective* discount or credit prices they must pay for the new guitars. For easy reference, the table below summarises the *effective price* formulae, relative to the *annual cost of trade credit* decision rules presented earlier, for any COD price (P) on terms (c/t: T) and a customer opportunity rate (r)

Price	COD (P)	Credit Price (P')	Discount Price (P")
	P	P [1-(rT/ 365)]	P [(1-c) - (r t / 365) (1-c)]
Decision			
r < k = 365c / (T-t)		P' > P" < P	Take the discount
r > k = 365c / (T-t)		Opt for the credit period	P' < P" < P

Now, let us apply all the data from the previous Exercise to these price formulae.

			(£ rounded)
Cash Customers		(COD) P =	1,150.00
Credit Customers		P =	1,150.00
Price Reduction	P. rT / 365	=	9.45
Effective *Credit* Price	P' = P [1-(rT / 365)]	=	1,140.55
Discount Customers		P (1-c) =	1,127.00
Price Reduction	P(1-c). r t / 365	=	3.09
Effective *Discount* Price	P" = P [(1-c) - (r t / 365) (1 – c)]	=	1,123.91

2. Conclusions

Given the customers' *opportunity cost of capital*, the "effective" price framework confirms their discount decision, relative to the creditor firm's *annual cost of trade credit* dictated by its terms of trade. Even customers with a relatively high opportunity cost of 10 per cent would fund their purchases by borrowing to pay the lower discount price, rather than the higher credit price.

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3. The Creditor Firm's Perspective

If a reduction in price relates to an increase in demand, the movement from cash to discount and credit sales with their associated time value of money benefits should increase turnover. But there are "hidden" costs.

The (2/10:30) credit terms offered by the Slash Company are common throughout the UK and elsewhere. So, perhaps the Slash Company has decided to adhere to their competitors' policy with its new product launch. However, no customer trading with the firm (or others) who opts for the discount need borrow at 36.5%. Within the context of the credit period, the discount policy is far too generous. Despite established convention, it is a wasteful concession to debtors leaving the company to count the cost of *sub-optimal* terms of sale, which reduce the effective discount price too far below its cash and effective credit prices.

- Without detailed reference to the *price elasticity* of demand, underpinned by customer borrowing rates (all of which may be unique to the Slash Company) future profitability could be inhibited unnecessarily.
- Before launching the new guitar, the company should reconsider the terms of sale offered to its wholesalers.

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6.5 Exercise 6.4: "The Real" Cost of Trade Credit

Having studied "Strategic Debtor Management" from either core text, you will recall the following contributory factors for a historical build-up of debtors, which then requires a corresponding increase in working capital investment to maintain production, in sophisticated market economies.

- Creditor firms often offer large discounts to induce early payment from *all* their clientele, including *high risk* customers with excessive opportunity cost of capital (borrowing) rates. Although this means the receipt of less money, it should arrive earlier and hopefully the reduction in price is more than compensated for, by an increase in demand and hence profit.
- High risk customers, however, typically suffer from liquidity problems. So, if taking the discount by the end of the discount period is not viable, they must opt for the end of credit period. Better still, if suppliers' debt collection procedures are lax, they will actually remit payment well beyond this date to compensate for the loss of a significant discount.

Empirical studies outlined in the core texts also explain the build-up of debtors and working capital by exploding the *myth* that customers who do not take cash discounts, or pay late, are *always* poor credit risks. On the contrary, some are maximising their own profitability by easing cash flow at the expense of the creditor firm.

Unscrupulous (*unethical* but *rational*) customers without liquidity problems often forego the discount period and offset the resultant cost (or even where discounts are not offered, increase the benefit of trade credit) by *unilaterally* extending the payment period.

It is also common for debtors (irrespective of their risk profile) to still take the discount when they eventually remit payment!

To illustrate the cost of *ineffectual* and *sub-optimal* credit policies from a creditor firm's perspective, rather than the benefit to debtors, let us return to Chapter Five and the data for the Pixie Company (Exercise 5). The development of the question should also deepen your comprehension of working capital management from a *financial* rather than an *accounting* perspective.

You will recall that despite increased turnover and a history of Balance Sheet solvency, the Pixie Company is beset by liquidity problems. To summarise its financial position:

- Current assets far exceed current liabilities.
- The working capital ratio has risen from one year to the next
- The conversion of raw materials to the eventual receipt of cash from debtors (*the operating cycle*) far exceeds the credit period granted by suppliers (*the financing cycle*).

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We concluded our analysis by suggesting that the difference between the periods of credit taken compared to that granted is the root cause of the company's current liquidity crisis. Over a two year period, customers are taking 73 and 87 days to pay (compared with creditor turnover ratios of 61 and 55 days) respectively,

To illustrate Pixie's dilemma, let us now introduce a new piece of information.

The company offers its clientele "standard" industry terms of (3¾ / 7: 45).

Required:

1. Evaluate why adopting terms of sale that conform to the industry "norm" may have created the company's liquidity crisis.
2. Given the assumption that the availability of credit is a necessary pre-condition for trade, suggest how companies such as Pixie can improve their liquidity without increasing the cash price for goods and services, or raising external finance to support future production.

An Indicative Outline Solution

A company's terms of sale (c/t: T) need not conform to traditional industry standards. Chapter Eight "Working Capital and Strategic Debtor Management" and Chapter Four "Strategic Debtor Management and the Terms of Sale" (2013) illustrate why *variations* in the cash discount (c), discount period (t) and credit period (T) all represent *dynamic marketing* tools that can restructure "effective" discount and credit prices (P" and P') relative to an original (constant) cash price (P).

By manipulating the time value of money and opportunity cost concepts for both the buyer and seller:

"Ideal" credit terms should create "purchasing power" for customers who need to delay payment. Such terms not only increase demand for the creditor firm, but also maximise the net cash profit from their associated cost – revenue function, which may be unique.

1. The Liquidity Crisis

The key to understanding the problem that confronts the Pixie Company is defined by the familiar relationship between a creditor firm's annual cost of trade credit [k = 365c/(T-t)] and their customers' annual opportunity cost of borrowing, (r).

Customers will logically *take the discount* if:

$$r < k = 365c/(T-t)$$

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The following simple interest calculations illustrate the enormous financial burden (k) of *not taking the discount* that Pixie's terms of trade have imposed on all its customers, irrespective of "realistic" borrowing opportunities.

Annual Costs of Trade Credit ($3\frac{3}{4}$ /7: 45)

	Industry terms (45 days)	**Last Year** (73 days)	**This Year** (87 days)
$k = \frac{365c}{(T - t)}$	36%	20.7%	17.1%

Most debtors have obviously abandoned their agreed terms of sale (3¾ /7: 45) altogether, resulting in deteriorating *average* debtor turnover ratios revealed by Pixie's annual accounts.

Many are foregoing the cash discount and *unilaterally* extending their repayment period, not only beyond the legal maximum of 45 days but also well beyond 87 days this year (remember this is an *average*) simply to bring the annual cost of trade credit closer to their own opportunity cost of borrowing. Explained simply, given today's term structure of interest rates, no company need borrow funds at even 17.1 per cent.

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2. Improving Liquidity

Although the advantage of trade credit for debtors represents an *explicit* cost-free source of finance, without increasing price or borrowing to survive, the Pixie Company must consider revising its credit terms and tightening its collection procedures as a matter of urgency.

Generous discount terms are being offered to attract trade. But credit control procedures (perhaps including vetting) are weak. The discount policy confers unnecessary benefits on cash customers. They also force customers who do not take a discount to remit full payment well beyond the standard credit period.

To solve its liquidity problems, without compromising future demand and cash profitability:

- The company should initially reconfigure its credit period to entice low "effective" price (*high* opportunity rate) buyers.
- Within this context, the cash discount should be utilised to provide a lower cash price for customers with *low* opportunity rates.
- All debtor levels (discount or credit) should then be monitored continuously, using an *age analysis* to forewarn of any subsequent "bad debt" loss.

6.6 Summary and Conclusions

This Chapter's Exercises subscribe to the *normative*, over-arching objective of financial management explained throughout my bookboon series, which creates wealth through an *optimum* combination of investment and financing decisions that generates *maximum* net cash inflows at *minimum* cost.

Within this context, optimum terms of sale are *the determinant* of an optimum working capital structure. In other words, optimum investments in inventory, debtors, cash and creditors are *determined by* a company's optimum terms of trade (and not *vice versa*).

Using the time value money and present value (PV) analysis, we have demonstrated how credit policy variables (discount policy and the credit period) elicit a *price reduction* associated with either the discount price P (1-c), or the credit price (P). These define their corresponding "effective" prices (P" and P', respectively).

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The previous Exercises (supplemented by your reading of the companion bookboon texts referenced at the end of this Chapter) confirm that if credit terms are a precondition of trade, then contrary to the balance of academic literature and practice on the subject:

- Terms of sale need not conform to industry "norms". They may be "unique" to a creditor firm, depending on its own structure of revenue and costs and the risk-return profile of their customer portfolio.
- Companies must first review their *credit related demand function* and derive *optimum* terms of sale within the context of an *optimum* credit period.
- The *optimum* credit period should be set for a *high* opportunity rate clientele that cannot benefit from *ineffectual* debt collection procedures.
- Discount policy should be designed to attract *low* opportunity rate customers.
- Rather than offer an expensive discount *for all*, the creditor company should provide a *selective* price reduction, which creates a *positive* contribution to net cash inflow and corporate wealth (through shorter operating cycles and lower financing costs).
- Debtor levels for all class of customer (high or low risk) should then be monitored continuously, using an *age analysis* to pre-empt any subsequent "bad debt" loss.

Finally, remember that the whole process is *dynamic*. With changing economic conditions, revised terms of sale may become *suboptimal* and require speedy revision.

Selected References

Hill, R.A., bookboon.com.

Text Books:

Working Capital and Strategic Debtor Management, 2013.

Business Texts:

Working Capital Management: Theory and Strategy, 2013.
Strategic Debtor Management and the Terms of Sale, 2013.

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Part Four:
Summary and Conclusions

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7 Review Exercises

7.1 Introduction

The terms of sale that creditor firms provide for customers should represent *dynamic* components of their financial and marketing strategies. Based on the *time value of money*, late payment associated with the credit period and early payment for a discount both represent a form of *price competition*. They provide debtors with lower "effective" price options, defined by their annual opportunity cost of borrowing, compared to the original invoiced "cash" price.

If price is *inversely* related to demand, the availability of trade credit should *increase* the creditor firm's turnover. In theory (and hopefully practice) all parties to sales transactions should benefit.

Of course, how a company actually chooses an *optimum* combination of credit policy variables that also *maximise* profit, once a range of customer opportunity rates are established, involves a complex sequence of managerial decisions where the net gains require careful consideration.

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A change in either the credit period or cash discount policy creates a unique level of demand, which results in a unique structure of costs and revenues associated with each debtor policy. As we observed in the previous Chapter, the *optimum* credit period should be set for a *high* opportunity rate (high-risk) clientele. Discount policy should be designed to attract *low* opportunity rate (quality) customers. However, as we also noted, when economic circumstances change, credit policy variables must be reviewed.

For example, if the structure of interest rates changes, the borrowing costs for each class of customer alters. Since these determine the monetary value of trade credit in present value (PV) terms and the creditor firm's "effective" price-demand function, ultimately they will redefine its total working capital requirements; not only debtors but also creditors, inventory, the need for *precautionary* cash balances and borrowing to support production.

The purpose of this Chapter is to review this *credit related funds system* with reminders of how a firm's working capital structure, underpinned by liquidity and cash flow, is *determined* by the level of debtors, optimum or otherwise.

7.2 Exercise 7.1: Working Capital: A Review

Having read the appropriate bookboon companions and Parts One and Two of this study, you will recall that the overall objective of working capital management is to ensure that *operational* (short-term) transactions, which are required to support the demand for a firm's products and services arising from either cash or credit sales, actually take place.

Chapter Two and Seven of "Working Capital and Strategic Debtor Management" and Chapter Three of "Strategic Debtor Management and the Terms of Sale" (2013) explained the whole procedure, which is summarised by the flow chart in Figure 7.1.

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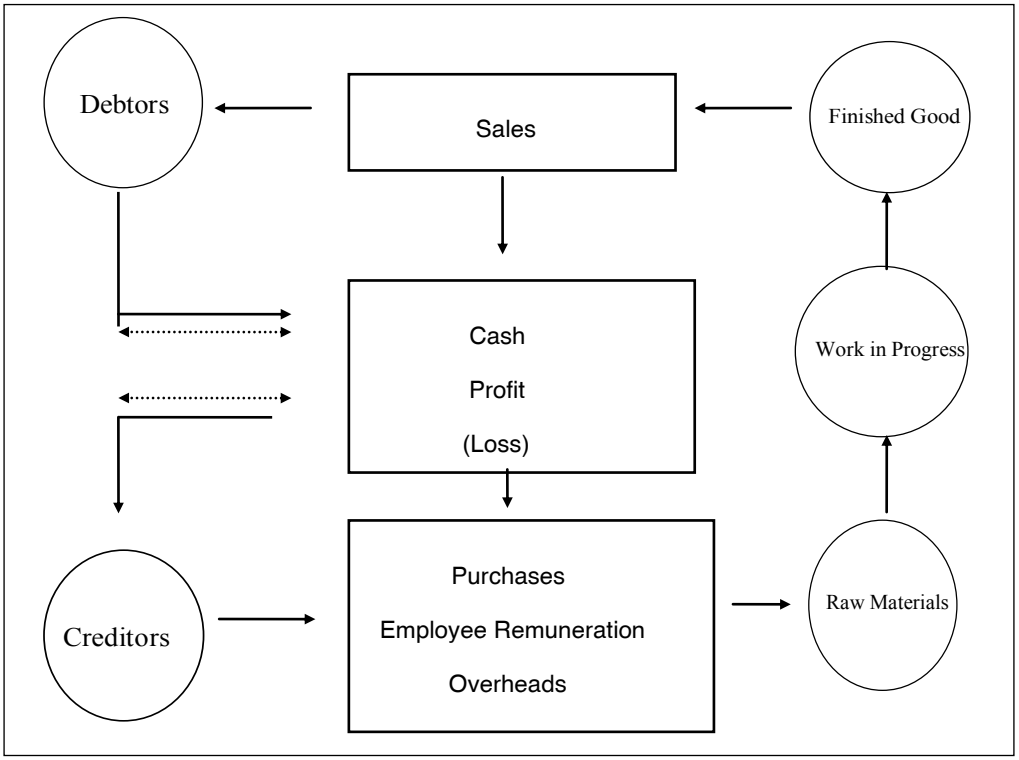

Figure 7.1: The Structure and Flow of Working Capital

Required:

Produce a written commentary to explain the sequence of events illustrated by Figure 7.1.

An Indicative Outline Solution

If you have referenced my source material, the first points to note are the three *square* boxes and two *dotted* arrows.

- The cash balance at the centre of the diagram 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 retained for reinvestment, placed on deposit or withdrawn from the business.

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.

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On the *demand* side, we can identify two factors that affect cash transactions adversely. Unless the firm requires cash on delivery (C.O.D.) 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 their stock of finished goods. For a manufacturing company there will also be raw materials, plus items of inventory at various stages of production that 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, a deficit, or zero balance.

Surpluses may be re-invested or distributed as dividends.
Deficits will require financing.
Zero balances may require supplementing.

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Thus, we can conclude that a firm's working capital structure defined by the terms of trade, determines a forecast of its overall cash requirements (the credit related funds system) which relate to:

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

7.3 Exercise 7.2: Cash Flow and the Budgeting Process

Open any "Management Accounting" text and you will find that the subject of working capital invariably begins with the preparation of a cash budget that forecasts a company's *short-term* expected cash flows for the period under review. This may vary from a single day up to a year or even longer, depending on the production process, so borrowing to finance a deficit (or reinvesting surplus funds) can be planned as smoothly and efficiently as possible.

Turn to "Financial Management" and cash still holds a central position. However, *short-term* finance and investment decisions are evaluated within the context of *long-term* wealth maximisation, based on present value (PV) analysis.

The role of the financial manager is to reconcile these two functions. Holding cash entails a cost, namely the *opportunity* cost of profits that could be earned if cash was used within the firm, or invested *elsewhere*. Therefore, management needs to *balance* the advantages of profitability against liquidity.

> Cash should only be held until the *marginal* value of its liquidity equals the value of *alternative* investments foregone
>
> Since *idle* cash is *unprofitable* cash, a fundamental objective of working capital management is to optimise the amount of cash available to the company and maximise the reinvestment of any surplus not required immediately.

Required:

Drawing upon your knowledge of Management Accounting and Financial Management, provide an overview of the preparation of a cash budget from an overall corporate perspective.

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An Indicative Outline Solution

Cash budgeting amalgamates information from a variety of sources. It reveals the expected cash flows relating to the *operating* budget, (sales minus purchases and expenses) and the *capital* budget (net borrowing, which incorporates adjustments for interest, tax and dividends). The corporate motivation for holding cash is threefold.

- The *transaction* motive to ensure sufficient cash meets known liabilities as they fall due.
- The *precautionary* motive, based on the likelihood of uncertain events occurring.
- The *speculative* motive, which identifies temporary opportunities to utilise excess cash.

Actual deviations from *forecast* figures are therefore inevitable. So, astute management will prepare more than one cash budget to anticipate possible future scenarios. For example:

- A *target* budget that assumes forecast sales are achieved.
- An *optimistic* budget that assumes above-forecast sales.
- A *pessimistic* budget that assumes below-forecast sales.

Ultimately, the accuracy of each budget therefore depends on a forecast of future sales determined by its "terms of trade" over the planning period. Four distinct phases are involved in its preparation.

Forecast Cash Inflow divided between cash and credit sales (adjusted for any seasonal variations and bad debt loss) plus other cash receipts from investment income and the sale of fixed assets.

Forecast Cash Outflow represented by the payment of trade creditors, employee remuneration, administrative costs, capital expenditure, interest, taxation and dividends.

Forecast Net Cash Flow that compares these periodic anticipated receipts and payments.

Cumulative Net Cash Flow for each period, calculated by adding the opening cash balance to the net cash flow for the period.

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

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7.4 Exercise 7.3: Cash Flow and Accounting Profit

A persistent critique throughout this study and our companion bookboon texts concerns the traditional accounting definitions and presentation of working capital in published financial statements and their conventional interpretation by *external* users of accounts. Explained simply, they reveal little about a company's "true" financial position, future cash flow, or managerial policy.

Required:

Turning to the presentation of *internal* managerial data, outline the differences between a periodic cash budget and its corresponding forecast Profit and Loss Account.

An Indicative Outline Solution

Areas where the two cash flow and accounting statements differ can be identified and classified as follows:

1. The cash budget only records actual receipts from customers, including sales from previous periods. The Profit and Loss Account (P&L) records forecast sales for the period, even though payment may "carry over".
2. The cash budget records budgeted cash payments to suppliers. The P&L records forecast cost of sales, which incorporate opening stock, plus purchases, less closing stock.

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3. The cash budget reveals the budgeted payments for expenses. The P&L records expenditure expected to be incurred in the period, but not necessarily paid for.
4. The cash budget records the cost of purchasing a fixed asset at the expected date of purchase and the proceeds when it is eventually sold. The P&L records a periodic depreciation charge which involves no cash flow (a *non-cash* expense) for the consumption of the asset and either a profit or loss on its disposal.
5. The cash budget records tax payments when they fall due, which may relate to previous period's profits. The P&L offsets the expected tax liability against profits earned in that period.

To summarise: the cash budget relates to the *timing* of cash payments and receipts, whilst the P&L relates to income earned and expenses incurred over the period on a traditional *accrual-prepayment* basis.

For example, focussing on the "terms of trade" a sales forecast for the accounting year end (December say) would appear in the annual P&L for that year. But if sales were on ninety days credit they would not appear in the cash budget until the following year (February). Likewise, if the suppliers' credit period was sixty days it would not appear in the cash budget until the following January.

7.5 Exercise 7.4: The Preparation of a Cash Budget

Before concluding our study with a review of the terms of sale and their contribution to the overall wealth of a creditor firm, we cannot leave the *general* subject of working capital without illustrating how a company's "credit related funds system" determined by its debtor policy is underpinned by the managerial cash budgeting process.

The following information relates to an Executive Board meeting at Kasabian Ltd. recently set up as an academic e-book publisher.

Individual texts are available online from their website in *pdf* format at a uniform selling price of €15. Customers are invoiced on the last day of the month.

The Marketing Director has forecast the following sales volumes:

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Books:	1,000	1,000	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2,300

Customers are expected to remit payment as follows:

One month after the download	40%
Two months after the download	60%

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The Finance Director has also contributed the following information

The variable costs of production per book (€) are:

Materials	5
Labour	4
Overhead	2

All books are produced two months before they are sold and Kasabian's creditors are paid two months after production.

Variable overheads are paid in the month following production and are expected to increase by 25 per cent in April.

75 per cent of salaries are paid in the month of production and 25 per cent in the following month. A salary increase of 12.5 per cent will take place on March 1st.

The company is going through a modernisation process and will sell one of its office suites in May for €25,000. It is also planning to buy new print hardware in May for €10,000. Depreciation is currently €1,000 per month, and will rise to €1,500 after purchasing the equipment.

The company's corporate tax liability of €10,000 is due for payment in March.

The company's cash balance on December 31st is €1,500.

Required:

1. Produce a cash budget for the six months from January to June.
2. Examine the budget and comment on how the Kasabian Company can improve its forecast working capital position.

Briefly summarise your findings.

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An Indicative Outline Solution

1: The Cash Budget (for the six month period ended 30 June)

Calculations

Sales Receipts

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Forecast Sales (S)	1,000	1,000	1,000	1,250	1,500	2,000	1,900	2,200
	€	€	€	€	€	€	€	€
Sales (S x 15)	15,000	15,000	15,000	18,750	22,500	30,000	28,500	33,000
Debtor Period:								
1 month 40%		6,000	6,000	6,000	7,500	9,000	12,000	11,400
2 months 60%			9,000	9,000	9,000	11,250	13,500	18,000
			15,000	15,000	16,500	20,250	25,500	29,400

Payment for Materials – e-books produced two months before sale

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Quantity (Q)	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2,300
	€	€	€	€	€	€	€	€
Materials (Q x 5)	5,000	6,250	7,500	10,000	9,500	11,000	11,000	11,500
Paid 2 months later			5,000	6,250	7,500	10,000	9,500	11,000

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Variable Overheads

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Quantity (Q)	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2,300
	€	€	€	€	€	€	€	€
Overhead (Q x 2)	2,000	2,500	3,000	4,000	3,800			
Overhead (Q x 2.5)						5,500	5,500	5,750
Paid one month later		2,000	2,500	3,000	4,000	3,800	5,500	5,500

Salaries

	Dec	Jan	Feb	Mar	Apr	May	Jun	
Quantity (Q)		1,250	1,500	2,000	1,900	2,200	2,200	2,300
		€	€	€	€	€	€	€
Salaries (Q x 4)		5,000	6,000	8,000				
Salaries (Q x 4.5)					8,550	9,900	9,900	10,350
75% this month		3,750	4,500	6,000	6,412	7,425	7,425	7,762
25% next month			1,250	1,500	2,000	2,137	2,475	2,475
		3,750	5,750	7,500	8,412	9,562	9,900	10,237

The Cash Budget

	Jan	Feb	Mar	Apr	May	Jun
	€	€	€	€	€	€
Receipts:						
Credit sales	15,000	15,000	16,500	20,250	25,500	29,400
Property Disposal	-	-	-	-	25,000	-
	15,000	15,000	16,500	20,250	50,500	29,400
Payments:						
Materials	5,000	6,250	7,500	10,000	9,500	11,000
Variable Overheads	2,500	3,000	4,000	3,800	5,500	5,500
Salaries	5,750	7,500	8,412	9,562	9,900	10,237
Equipment	-	-	-	-	10,000	-
Corporation Tax	-	-	10,000	-	-	-
	13,250	16,750	29,912	23,362	34,900	26,737
Net cash flow	1,750	(1,750)	(13,412)	(3,112)	15,600	2,663
Balance b/f	1,500	3,250	1,500	(11,912)	(15,024)	576
Cumulative cash flow	3,250	1,500	(11,912)	(15,024)	576	3,239

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2: The Working Capital Position: A Commentary

Given the anticipated cash deficits that will occur in March and April, Kasabian Ltd. must identify suitable methods of financing to ensure continuity of future production. Companies typically finance short-term cash deficits (if only by default) with their *overdraft facilities*. However, we are not aware of any such arrangements with their bankers. So, Kasabian should consider the following steps.

a) Revisions to the Terms of Trade

- *Reduce the debtor collection periods*. For example, if the company could reverse the trend by introducing a modest discount for early payment and an interest charge for default, so that 80 per cent of customers paid one month after the sale and only 20 per cent after two months, the cash flow would improve significantly.
- *Delay the creditor payment period*, perhaps for a month. Although this should only be by prior agreement with suppliers and not *unilateral*.

From the outset of this study we have observed that for a given level of sales using *time value of money* criteria, accounts receivable (from debtors) should be *collected* as soon as possible and, accounts payable (to suppliers) should be *delayed* as long as possible. However, as we noted at the beginning of Chapter Four, both policies may be untenable because of their "goodwill" implications.

The former ignores the fact that a reduction in the period of credit granted to customers may cause the company's clientele to look elsewhere, thereby reducing future sales. Likewise, an increase in the creditor payment period offered to suppliers may cause them to cease trading with the company altogether, thereby interrupting the whole production process.

b) Reductions in the Level of Inventory

Kasabian Ltd is effectively holding two months' stock. If this figure was reduced, or better still "just in time" (JIT) techniques were adopted, the cash flow would improve.

c) Delays to Capital Expenditure

Perhaps the purchase of new computer hardware could be delayed. Although it would not affect the deficit in March or April, delaying the purchase until June or July would ease the cash drain in a very difficult month (particularly if the office suite sale did not go through until May).

d) Deferred Taxation

Although the non-payment of corporation tax is illegal, maybe the fiscal authorities would consider its payment by future instalments.

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Summary

If none of the above options are possible, then Kasabian Ltd. must approach its bank (or other financial institutions) to obtain either an overdraft facility, or short-term loan to cover the deficits. Failing this and if it is to survive, the company must consider *debt factoring* and the possibility of *sale and leaseback* as a matter of urgency.

7.6 Exercise 7.5: Terms of Sale: A Review

The preparation of a cash budget in our previous Exercise reveals how a creditor firm's investment in current assets and other cash outflows relating to its operating cycle, as well as the borrowing and associated costs required to sustain it, (the financing cycle) are primarily a function of the terms of sale.

So, to conclude our analysis, let us re-examine how a change in either the credit period or cash discount policy results in a unique structure of costs and revenues associated with a company's sales turnover by creating a unique level of demand, which determines its working capital commitments.

Despite the use of net present value (NPV) techniques to vet all new capital investments, Goldfrapp plc is experiencing continual liquidity problems. The Board believes that somehow, the terms of sale are the root cause and has employed financial consultants to review the company's working capital function.

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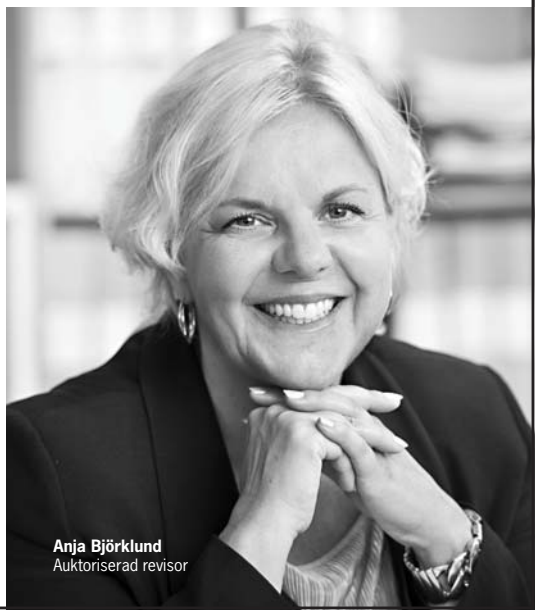

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The consultancy's first observations are that with standard industry terms of 2.5/10:40 offered to all its customers, liquidity is indeed a problem, if only because Goldfrapp's *actual* debtor turnover ratio revealed by its latest annual accounts is 85 days.

A detailed analysis of the company's credit-related demand function prepared by the consulting team confirms that a move to uniform terms of 1/15:45 should not only improve cash flow, but also increase sales without compromising future profitability.

Required:

Applying the available Goldfrapp data to what you have learned from this study's Exercises and companion texts:

1. Explain why the company's current working capital position is at variance with an optimum investment in current assets and current liabilities, which maximises the inflow of cash at minimum cost.
2. Derive the customers "decision to discount" using *three* annual "cost of trade credit" calculations based on:
   - Current terms of sale (2.5/10:40)
   - Current discount policy with a debtor turnover of 85 days (2.5/10:85)
   - Revised terms of sale (1/15:45)
3. Comment on your results.
4. Explain how the previous "decision to discount" calculations can be reformulated within a theoretical framework of "effective" prices
5. Examine the "effective" price benefits of revising the company's credit terms from 2.5/10:40 to 1/15:45 using all the available information.

An Indicative Outline Solution

Your answer requires an analysis of working capital *efficiency* that compares alterative costs of trade credit and effective prices, relative to those based on Goldfrapp's current terms of sale.

1. Efficient Working Capital Management

As far back as Chapter One, we defined working capital as an investment in current assets *irrespective* of its financing source and rejected the *accounting* convention that firms need to maintain 2:1 and 1:1 working capital and liquidity ratios revealed by a published Balance Sheet. Such policies are invariably *sub-optimal*, relative to the normative wealth maximisation criteria of financial management.

Management's objective should be to *minimise* current assets and *maximise* current liabilities compatible with their *debt paying ability*, based upon *future cash profitability*.

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These points were illustrated in Chapter Three by reference to the "ideal" relationship between a firm's short-term operating and financing cycles, where raw materials are purchased and finished goods are sold on credit, subject to the proviso that:

Operating cycles (conversion of raw material to cash) < Financing cycles (creditor turnover)

Although we are not aware of the company's overall working capital position (current assets relative to current liabilities), Goldfrapp plc has a particular problem. Based on available data, its average debtor turnover of 85 days far exceeds the *legitimate* credit period of 40 days.

2. The Annual Cost of Trade Credit

The decision to discount is based on the creditor firm's annual cost of trade credit *exceeding* a customer's assumed annual opportunity cost of capital rate (r). Using the familiar Equation (13) from our previous studies:

$$r < k = 365c / (T-t) \text{ (Take the discount)}$$

Three annual costs of trade credit (k) can be derived from the company data:

Credit Terms	(2.5/10:40)	(2.5/10:85)	(1/15:45)
Cost of Trade Credit (k)	30.4% (current)	12.2% (default)	12.2% (revised)

3. A Commentary

The simple interest calculations, using the right-hand side of Equation (13) illustrate the enormous financial burden (k) of *not taking the discount* that Goldfrapp's terms have imposed on all its customers, irrespective of their borrowing opportunities (r). Explained simply:

> Given today's term structure of interest rates, no company borrows funds at 30.4 per cent.

Consequently, most debtors have obviously abandoned their agreed terms of sale (2.5/10: 40) altogether, resulting in the *average* 85 day debtor turnover ratio.

Many are foregoing the cash discount and *unilaterally* extending their repayment period, not only beyond the legal maximum of 40 days but also well beyond 85 days this year (remember this is an *average*) simply to bring the annual cost of trade credit closer to their own opportunity cost of borrowing.

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4. The Effective Price Framework

Throughout this study (and its companions) we have noted that corporate terms of sale need not conform to industry norms.

Variations in the cash discount, discount period and credit period all represent dynamic marketing tools, which are a form of price competition. Based upon the time value of money and opportunity cost concepts, they create purchasing power for discounting and non-discounting customers by offering lower *effective* prices, all of which should increase demand for the creditor firm and hopefully net profits from revenues.

A firm should design its credit periods to ensure low effective price, *high* risk customers (with high opportunity rates) who forego the cash discount pay on time. Discount policy should be utilised to provide a lower effective cash price for *low* risk customers (with low opportunity rates) as an incentive for early payment.

With a COD price (P) on terms (c/t: T) and a customer opportunity rate (r), the *generic* decision to discount, based on the annual cost of trade credit [k = (365c/T-t)] can be reformulated using a framework of effective discount and credit prices and compared as follows.

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Price	COD (P)	Credit Price (P')	Discount Price (P")
	P	P [1-(rT/ 365)]	P [(1-c) - (r t / 365) (1-c)]
Decision			
r < k = 365c / (T-t)		P' > P" < P	Take the discount
r > k = 365c / (T-t)		Opt for the credit period	P' < P" < P

5. Revising the Company's Credit Terms

Finally, given the previous *general* theoretical formulations, let us illustrate the Board's dilemma by applying the limited information for Goldfrapp plc to a *specific* class of customer.

Decisions to discount for any *class* of customer with a *given* opportunity rate (r) based on the formula [k = (365c/T-t)] can be confirmed by an *effective price* framework (at one extreme C.O.D., at the other the credit period and in between the discount period) even *without* price information.

For example, if Goldfrapp moves from the current terms of sale (2.5/10:40) to those recommended by their management consultants (1/15:45):

The whole range of effective prices, denoted *algebraically* by an initial cash price (P) for those customers with an annual opportunity rate (r) of 10% can be defined as follows:

Price Terms	COD P		Credit Price (P') P [1-(rT/ 365)]		Discount Price (P") P[(1-c) - (r t / 365) (1-c)]
2.5/10:40	P	>	P'_O = P (0.989)	>	P''_O = P (0.972)
1/15:45	P	>	P'_R = P (0.987)	>	P''_R = P (0.986)

Where the price *subscripts* ($_O$ and $_R$) relate to original and revised terms, respectively.

Because the only *unknown* in the series of equations is the *uniform* cash price (P) those variables for which we have data combine to provide a valid *arithmetic* comparison (the figures in brackets) of the range of effective prices. These calculations confirm the company's dilemma illustrated by our previous cost of trade credit data.

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Effective Prices COD Credit Price (P') COD Discount Price (P")

$$P > P'_O > P'_R \qquad P > P''_R > P''_O$$

The series of inequalities reveal that the original credit period offered by Goldfrapp plc is too harsh and the original discount policy is an expensive concession for all (think about it).

The Annual Cost of Credit (k) 30.4% (current terms) 12.2% (revised terms)

7.7 Summary and Conclusions

The preceding series of Exercises reveal that the *accounting convention* whereby companies should maintain a 2:1 working capital ratio (underpinned by an analysis of Balance Sheet liquidity) is invariably *sub-optimal*.

For a given level of sales, at any point in time:

> Corporate wealth is dependent on the net inflow of cash associated with the efficient management of its overall investment and financing decisions using the time value of money and net present value (NPV) analyses.

From a managerial working capital perspective (subject to no loss of goodwill) we might therefore conclude that receipts from debtors should be collected as soon as possible, whilst payments to creditors should be delayed as long as possible. However, such policies are too simplistic.

As a guide to further study, you should remember that the primary purpose of a company's terms of sale is *to increase profit through turnover*. Why else offer trade credit?

- Management's overall objective should be to maximise current liabilities and minimise current assets compatible with their debt paying ability, based upon *future cash profitability*.
- Variations in the cash discount, discount period and credit period should all represent dynamic *marketing* tools designed to achieve this *financial* objective.
- Based upon the time value of money and opportunity cost concepts, the terms of sale create purchasing power for customers. Properly conceived they should therefore enhance demand for the creditor firm and hopefully, net profits from revenues within a framework of effective prices and the annual cost of trade credit.
- Contrary to the balance of academic literature and accounting practice, terms of sale need not conform to industry norms. They may be unique to the creditor firm, depending on the risk profile of their customer portfolio.

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To conclude our analysis, it therefore follows that an *optimum* debtor strategy defined by a company's terms of sale (including the division between discounting and non-discounting customers) not only determines an *optimum* investment in debtors but also *optimum* inventory, cash and creditor policies. Amalgamate all these components and the *optima* define an efficient structure of current assets and liabilities at any point in time and the firm's future working capital requirements.

7.8 Selected References

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