A value-based financial decision framework for an entrepreneurial aviation entity

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ABSTRACT

The Aviation Industry in South Africa is considered to be a budding industry with an
epected growth rate of 14% for each of the next three years. Considering that, plenty
vestment and expansion possibilities are probably available in this industry.
Nonetheless, given the current economic situation, challenges may exist that
ecessitates the development of a decision framework. The aim of this framework should
thus be to assist with informed decision-making; whether to invest in, or utilize
opportunities that may occur within a given prospective “high” growth situation.

In the light of all of this, a specific aviation entity desires to exploit possible business
opportunities that may occur. Provided the relative high growth situation in the Aviation
Industry, as mentioned above, the entity has a specific need for a decision tool which
could determine whether to invest in new projects or not. In order to meet this need, a
decision framework has been developed during this study. Considering the emphasis
currently placed on wealth creation in the business environment, it is considered
appropriate to utilize the value-based management approach in this study, with specific
reference to capital budgeting techniques in developing a decision framework.

Data for the study has been obtained from the participating aviation entity, who was
considering investment in a specific project, given the previously referred to prospective
high growth situation in the Aviation Industry. The decision framework or model was
developed using Microsoft Excel as the development platform.

Based on the input data, as received from the aviation entity, the results from the decision
model indicated that the considered project was indeed financially viable.

Key terms: Value-Based Management, capital budgeting, shareholder value,
valuation, Aviation Industry.
ACKNOWLEDGEMENTS

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<td>AI</td>
<td>Aviation Industry</td>
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<tr>
<td>IAI</td>
<td>International Aviation Industry</td>
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<tr>
<td>IATA</td>
<td>International Air Traffic Association</td>
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<td>IACA</td>
<td>International Air Carriers Association</td>
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<tr>
<td>CAGR</td>
<td>Compound Annual Growth Rate</td>
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<tr>
<td>CFROI</td>
<td>Cash Flow Return on Investment</td>
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<tr>
<td>DCF</td>
<td>Discounted Cash Flow</td>
</tr>
<tr>
<td>EBITDA</td>
<td>Earnings before interest, taxes, depreciation and amortization</td>
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<tr>
<td>EVA</td>
<td>Economic Value Added</td>
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<td>EPS</td>
<td>Earnings Per Share</td>
</tr>
<tr>
<td>IRR</td>
<td>Internal Rate of Return</td>
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<tr>
<td>KPI</td>
<td>Key Performance Indicators</td>
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<tr>
<td>LCA</td>
<td>Low Cost Airlines</td>
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<tr>
<td>LD2</td>
<td>Load Device 2</td>
</tr>
<tr>
<td>MTOW</td>
<td>Maximum Take-Off Weight</td>
</tr>
<tr>
<td>MIRR</td>
<td>Modified Internal Rate of Return</td>
</tr>
<tr>
<td>NOPLAT</td>
<td>Net Operating Profit Less Adjusted Taxes</td>
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<tr>
<td>NPV</td>
<td>Net Present Value</td>
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<tr>
<td>PV</td>
<td>Present Value</td>
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<tr>
<td>ROE</td>
<td>Return on equity</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<td>----------</td>
<td>--------------------------------------------------</td>
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<tr>
<td>ROIC</td>
<td>Return on Invested Capital</td>
</tr>
<tr>
<td>RR</td>
<td>Retention Rate</td>
</tr>
<tr>
<td>SAAI</td>
<td>South African Aviation Industry</td>
</tr>
<tr>
<td>SACAA</td>
<td>South African Civil Aviation Authority</td>
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<tr>
<td>SVA</td>
<td>Shareholder Value Added</td>
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<tr>
<td>TVM</td>
<td>Time Value of Money</td>
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<tr>
<td>VBM</td>
<td>Value-based management</td>
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<tr>
<td>WACC</td>
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CHAPTER 1
INTRODUCTION

1.1 BACKGROUND

The creation of corporate value or wealth seems to have become a leading corporate objective for companies nationwide. Shukla (2009:66) mentions that conventionally the main drive of a company was to maximize profits, but this led to biased business practices and corruption of resources. Shifting the focus towards economic profit as opposed to accounting profit is a step in the right direction. This should be combined with new management approaches, conducive to the enhancement of wealth creation. According to Shukla (2009:66), investors have influenced corporate managers to focus on the creation of shareholder value. With this in mind, an aviation entity has posed the question: “Will a proposed new project create wealth for the entity?” This question is considered in light of the mentioned “new management methodologies”, with specific reverence to value-based management.

The introduction of value-based management (VBM) as a management tool, has specifically featured during the last decade. It is therefore essential that one, for purposes of the study, understand the terms “value” and “value management” generally, as well as specifically in context of the Aviation Industry.

Different viewpoints exist on the definition of what value should be, resulting in a problematic calculation of value in future terms. According to Stančić et al. (2012:95), “value” is created in terms of company value, when a company invests capital at an interest rate exceeding its cost of capital rate. The term “value management” is explained as a “managerial approach where company objectives, systems, strategies, processes, performance measurement and cultures have as their guiding objective, shareholder value maximization”. Value-based management can also be observed as providing managers with methods for development and implementation of value-creating strategies. Reward systems for management are to the effect only those that promote strategies which will ultimately create value (Baush et al., 2009:15). For the purposes of this study, the latter definition of value-based management has been adopted.
In light of the abovementioned chosen definition of value-based management, Ryan and Trahan (1999:47) indicate that some consulting firms have established metrics assisting in the implementation of VBM. These metrics include Discounted Cash Flows (DCF), Cash Flow Return on Investment (CFROI), Return on Invested Capital (ROIC) and Economic Value Added (EVA). All of these metrics were related upwards to shareholder value and downwards to established value drivers (Ryan & Trahan, 1999:48). These metrics could assist in determining the value added and will therefore be utilized in this study.

In addition to the mentioned metrics, value drivers are determined by assisting with the implementation process of VBM. Since strategy is too broad a term for ordinary employees to follow, actionable and evocative value drivers are developed, according to Knight (1998:167). These value drivers can be either financial or non-financial, according to Young and O'Byrne (2001:281). Financial value drivers specifically impact on financial figures, while non-financial value drivers relate to those drivers unrelated to financials, but could have an indirect impact on profitability, for example the safety of airlines. A list of financial and non-financial value drivers, with specific reference to the Aviation Industry, will be presented later in the study.

With reference to the aviation company’s question, a decision framework for investment purposes had to be developed to assist with decision-making on investing. Metrics and valuation methods also had to be incorporated in an attempt to answer the question at hand. In order to shed light on the proposed project, this is briefly discussed next.

A project to engineer and build an aircraft that could operate as a commuter as well as freight carrier, has been investigated. The aircraft should allow passengers to commute between smaller airports within South Africa. The concept of commuting by air has been launched by Santaco airlines recently (Child:2011). A single trip from Johannesburg to Bhisho will not cost more than R800 per ticket, whereas the trip via road transport currently costs R2 500. In the light of this, commuting via air travel could be beneficial to the commuting population and could be developed into a relatively “new” market. This new method of commuting could result into problematic investment decisions because of the relative riskiness of the investment. Proper investigation is therefore a prerequisite before entering into commitment, referring back to the main problem which this mini dissertation will attempt to address.
A case study within the Aviation Industry (AI) has been explored. A prospective fleet of aircraft necessitates a financial decision framework, as no investment decision model exist for this specific entity, according to the available data. Valuation techniques have been utilized in order to effectively valuate the entity. Developing a decision framework on the basis of capital budgeting techniques, VBM metrics and valuation methods, to assist with the decision-making process, has been the ultimate objective for this paper.

1.2 PROBLEM STATEMENT

Taking into account all available information, the author concluded that, within the context of value-based management, specifically regarding capital budgeting techniques, no financial decision framework for investment decision-making is currently available to entrepreneurial aviation entities considering an investment in an innovative project.

1.3 OBJECTIVES OF THE STUDY

1.3.1 MAIN OBJECTIVE

The objective of this study is to develop a financial decision framework that could assist entrepreneurial aviation entities with investment decisions regarding aviation projects.

1.3.2 SUB OBJECTIVES

The sub-objectives for this study are to:

- conduct a literature study regarding investment decision-making in the context of value-based management; and

- empirically develop a financial decision framework to assist entrepreneurial aviation entities with investment decisions, with specific reference to:
  - revenue and ticket prices;
  - purchasing versus leasing of aircraft;
  - net present value (NPV) analyses for aircraft purchasing scenarios;
  - NPV analyses for aircraft leasing scenarios;
  - weighted average cost of capital (WACC);
- economic value added (EVA);
- shareholder value added (SVA); and
- dividend growth.

1.4 RESEARCH METHODOLOGY

The research is based first and foremost on a literature study and secondly on an empirical study. The literature study includes the consideration of value-based management issues, with specific reference to valuation techniques and capital budgeting procedures. The empirical study is based on value-based management principles and capital budgeting techniques. Procedures will be conducted using Microsoft Excel software and programming techniques.

1.5 SCOPE OF THE STUDY

The field of the study is financial management, with specific reference to capital budgeting within the Aviation Industry in South Africa.

1.6 LIMITATIONS OF THE STUDY

The following could be considered as limitations to the study:

- Firstly, only specific data was obtained;
- Secondly, the data was obtained from one specific company; and
- Thirdly, this company had an explicit objective, namely to operate a small aircraft commuter/freight service.

Therefore this decision framework is not necessarily applicable to investment decision-making for the Aviation Industry in general.
1.7 LAYOUT OF THE STUDY

This study consists of the following chapters:

Chapter 1: An introduction to the problem statement as well as the main and sub-objectives of the paper.

Chapter 2: A literature review of the following topics:

- VBM theory;
- investment decisions in context of financial budgeting techniques;
- VBM metrics discussed; and
- the Aviation Industry discussed in context of VBM and the value drivers.

Chapter 3: A discussion of the outputs of the decision framework and the interpretations thereof.

Chapter 4: Conclusions and recommendations.

References.
CHAPTER 2
CREATING SHAREHOLDER VALUE: THE AVIATION INDUSTRY IN SOUTH AFRICA

2.1 INTRODUCTION

In an attempt to develop a decision framework for the entrepreneurial entity in the Aviation Industry within South Africa, a literature study on the theory of decision-making in the context of VBM was conducted. The VBM theory including metrics and capital budgeting techniques was studied, in order to include this information in the development of the decision model. The theoretical aspects of the mentioned tools were essential, with the purpose to better realise the possible results of the framework or model.

2.2 VALUE-BASED MANAGEMENT THEORY

The value-based management theory, according to Ittner & Larcker (2001:353), consists of a framework of value drivers which forms part of the mentioned framework, as well as metrics developed by consultancy firms.

2.2.1 INTRODUCTION TO VALUE-BASED MANAGEMENT

VBM as a management objective attempts to align all performance objectives with the creation of value in the business. VBM implies, in general, a corporate culture of key processes and systems in a company, aimed at the creation of value, with shareholder value establishment being the definitive goal (Young & O'Byrne, 2000:18). Young and O'Byrne (2000:18) mention a few elements within the business, which should be aligned with value creation, namely (1) strategic planning; (2) capital allocation; (3) operating budgets; (4) performance measurement; (5) management compensation; (6) internal communication; and (7) external communication. All decisions regarding these elements should be considered with the key word “value” in mind. With reference to the development of the decision framework, the key element that has to be addressed is capital allocation or budgeting.
2.2.2 DEFINITION OF VALUE-BASED MANAGEMENT

Individuals have different factors influencing their perceived assessment of value. These elements include quality of information, perception of control, time horizon, uncertainty and tolerance for risk. According to Knight (1997:25, 26) value, principally future value, is an idiosyncratic term and should be measurable in terms of monetary value.

Investors on the stock market will buy shares if the value is greater than the price, and sell stock if the price is greater than the value. Determining the value of a company, with some uncertainty, is attained by computing the present value of all the future cash flows (Koller, 1994:87). This calculation refers to the valuation of a company. In order to achieve a higher valuation, the returns on investment should exceed the cost of capital. The higher the returns, compared to the cost, the higher valuation.

Considering the abovementioned definitions of “value” and “valuation”, value-based management includes the following processes, according to Robu & Ciora (n.d.:4):

- creating value with respect to future value and growth;
- managing by value; and
- the measuring of value.

Processes, as indicated by Robu & Ciora (n.d.:4), are thus based on value generation with a futuristic vision, and should be measurable and manageable.

All of the efforts of the company should be focused on the creation of value. It is suggested by Koller (1994:87) that VBM should focus on the changing of corporate culture by aligning all business processes with value, setting both short and long-term objectives, and by managing both the balance sheets and income statements. It is essential that all stakeholders, employees, managers and shareholders, are knowledgeable with the “new way” of seeking value as an ultimate objective.

Concluding this section, the following remarks regarding the understanding of VBM should be considered:

- creating sustainable value for the company should be the core objective;
• this objective should be aligned from top management to the bottom-line employees;
• a corporate culture that will enhance value-creation should be adopted;
• it should be managed on an on-going basis and all decisions should be centred around the term “value-creation”; and
• in the quest for better decision-making regarding investments, value-based Management as a gateway, should enable efficient results for entrepreneurial entities in view of the above.

2.2.3 MANAGERS AND VBM

As the objectives of investors could diverge from those of managers, alignment of goals should be included when planning a VBM strategy. Investors seek to obtain the best return on their investments on a long-term basis, by means of dividends on shares acquired, but the question remains what the key objectives of managers are. Some managers only focus on the maximization of profits and are ignorant to shareholders’ affluence.

According to Megginson et al. (2010:21), managers should rather maximize shareholders’ wealth, than maximizing profits. The goal of maximizing profits emphasizes past and not future figures, and thus focuses on the income statement rather than the balance sheet. It therefore totally disregards the main principle of VBM, which is to manage value.

Maximizing profits as an objective, is oblivious to risk and focuses only on the short-term.

Other authors such as Ryan and Trahan (1999:47) agree with the above-mentioned and explain that VBM refers to the embracing of a corporate strategy, which should enable a company to maximize shareholder value. VBM is referred to as the inclusion of a corporate strategy, management compensation issues and reward systems; all aligned to relate employee performance to shareholder value, including managers. These reward systems should shift the objectives of managers from maximizing profits to maximizing shareholders’ value. Performance measures used to evaluate managers should be value-based and not profit-based. Managing a value-based company therefore indicates unique
visions of wealth building by all stakeholders involved. This viewpoint of wealth creation for shareholders was taken into account in the development of the decision model.

2.2.4 FRAMEWORK FOR VALUE-BASED MANAGEMENT

For a company to implement value-based management, a general framework has been invented by Ittner and Larcker (2001:353), as shown in Figure 2.1 below. This framework contains six steps that are discussed in detail. Other authors, such as Malmu and Ikäheimo (2003:236,251), consider this framework as normative, since most of the steps are comparable to other management frameworks; though some elements differ. Malmu and Ikäheimo (2003:236,251) however came to the conclusion that VBM adopters should incorporate the following four management approaches:

- aim to create shareholder value;
- identify value drivers;
- unite performance measurement, target setting and rewards with value drivers; and
- unite decision-making and action planning with value drivers.

As the four management approaches of Malmu and Ikäheimo (2003:236,251) are only broad instructions, the six steps of Ittner and Larcker (2001:353) are more appropriate for the purposes of this study and can be applied as a general guideline to the entrepreneurial entity if value-based management is incorporated.
Figure 2.1: Value-based management framework

Source: Adapted from Ittner & Larcker (2001:353).

The value-based management framework is reviewed next. It suggests a step-wise sequence of guidelines for the aviation entity to follow when deciding on the implementation of VBM (Ittner & Larcker, 2001:358-394).

**Step 1: Identify specific organizational objectives**

It was found that economic value measures, for example Economic Value Added (EVA) and Cash Flow Return on Investment (CFROI), enabled companies to notice fluctuations in shareholder wealth more effectively than traditional measures. These economic measures should replace traditional accounting measures for the following purposes: objective identification, budgeting processes and reward systems, as cited by Stern *et al.* (1995:32).

The question remains whether these economic measures, when utilized as primary objective measures, achieve success in maximizing shareholder wealth. Numerous studies have been conducted with regard to this subject, but resulted in mixed answers, thus all inconclusive. Other studies conducted with regard to the correlation between
performance measuring and shareholder returns, indicate that correlation between these elements can serve as a useful input in the process of ascertaining organizational objectives. For the purposes of this study, the aviation entity should, if adopting a VBM strategy, identify only those objectives which could ultimately boost prosperity for the company in general.

**Step 2: Develop strategies and select an organizational design**

According to the framework of Ittner & Larcker (2001:358-394), the identification of organizational objectives precedes the development of strategies and organizational design. These goals are the determining factors of strategies and design. The aims should be achievable by the developed strategies and designed to enhance shareholder value.

In view of the above, the process of creating wealth for shareholders seems to take priority when developing strategies and organizational design. Shareholder value principles have not failed management, but management has failed these principles. Rappaport (2006:2) explains that a general expectance from managers that short-term investments will increase share prices, lead to the management of earnings, which is contradictory to the first principle of value-creation. Rappaport (2006:3-10) has established ten principles for the creation of shareholder value. It is rarely found that any company can implement all ten principles effectively. These ten principles are explored next, in order to provide a basic understanding of how a value-based strategy is decided on.

**Principle 1: Do not manage earnings or provide earnings guidance**

Reliance on earnings seems to lead to unrealistic expectations. Asking why any company should not focus on earnings necessitates a three-fold answer. Firstly, change in the value of the company is not predicted by the accountant’s bottom line. Secondly, in attempting to increase short-term earnings, companies tend to either over- or under-invest. Lastly, companies like Enron and WorldCom portrayed blooming earnings, whilst actually destroying value, which eventually ruined them because of illegal accounting practices. For short-term success a company may depend on earnings, but earnings are usually not a prediction of long-term achievement.
**Principle 2: Decisions regarding strategy should maximize expected value, even if near-earnings are compromised**

In view of Principle 1, strategic decisions should be based on the expected value of future cash flows and not on historic earnings. A pro-active attitude by corporates with a futuristic outlook should lead these managers to better decision-making regarding possible outcomes for the future. VBM should be the tool in driving strategic decisions in order to create value for shareholders and for the company.

**Principle 3: Expected value maximization; acquisitions should be made, even if near-term earnings are lowered.**

Mergers and acquisitions announcements have exceeded $2.7 trillion during 2005. Decisions regarding whether to merge or acquire are usually based on the Earnings per Share (EPS) figures, which are considered not to be an indicator of long-term added value. Acquisitions should be weighed according to their ability to create long-term worth to the company.

**Principle 4: Only value maximization assets should be carried**

Companies can outsource low value added activities and commit to the high value added activities. Outsourcing should reduce costs if the outsourced company produces reliable outputs at lower costs. By outsourcing these low value adding activities, the company can specifically commit all efforts to high value adding activities, resulting in a possible higher value.

**Principle 5: Cash should be disbursed to shareholders when no reliable value-creating opportunities exist**

By distributing the cash on hand in the absence of any value-creating opportunities to shareholders through dividends and share buybacks, the company empowers the shareholders by obtaining higher returns elsewhere, while diminishing the risk of managers investing in value-destroying transactions.
**Principle 6: Reward systems for CEOs and senior executives for results of high long-term returns**

The standard options regarding reward systems for top management, are failing the general principles of value maximization. During the 1990’s, executives realized gains from any escalation in share price, ignorant of their competitors’ increments on share price. Long-term motivation is ignored when the typical consigning period is three to four years, with a possibility to cash out early. Adoption of a discounted indexed option plan or a discounted equity risk option (DERO) plan, will overcome the shortcomings of the standard option plans of reward. Indexed options reward managers only when the company’s shares outperform its competitors’ share prices. Annually the DERO plan’s price escalates by the yield to maturity on the ten-year U.S. Treasury note, plus a portion of the expected equity risk premium, minus dividends paid to the owners of the shares.

**Principle 7: Operating-unit executive reward systems for superior results of added value**

Business-unit executives, who are only responsible for value creation through the operating-unit under their control, cannot be held accountable for the company as a whole. These operating-unit managers should be rewarded by a different system to those mentioned in Principle 6. Typically incentive plans for these operating-unit executives are executed on basis of revenue, operating income and in some cases, non-financial targets. However, these metrics are not linked to long-term value creation results. Metrics such as Shareholder Value Added (SVA) is a better choice for this purpose. SVA is purely based on cash flow. To calculate SVA, the investments made during the period are subtracted from the discounted cash flows associated with sales growth and operating margins for the period. The period in question should be a continuous three-year period where the company can conserve a certain percentage of the pay-out in case of future possible underperformance.

**Principle 8: Reward systems for middle managers and frontline employees according to performance outputs on the key value drivers they influence directly**

As middle managers and frontline employees need specific measures to operate by daily, the SVA in Principle 7 creates a broader measure by which knowledge is gained on how
to increase the SVA on a daily basis. Companies should develop prominent indicators of value, which should have the following characteristics: measureable indicators, communicative systems and the ability to influence the long-term value of the business considerably. These indicators can be named value drivers and are discussed during the third step of Ittner & Larcker’s framework of VBM.

**Principle 9: Request senior executives to bear risks of ownership, just as shareholders do**

Interests of executives and shareholders should be aligned by balancing the benefits, by requiring executives to bear risks of ownership and the resulting impacts on their divergence and liquidity.

**Principle 10: Value-relevant information should be made available to investors**

In order to portray information concerning value to shareholders, a company can construct a “Corporate Performance Statement”, which consists of the following characteristics:

- Cash flows and accruals are separated - an evaluation of accrual estimates is made possible and provides a historical indication of the company’s cash flow projections;
- long cash-conversion cycles are classified into medium and high levels of risk;
- the corporate performance statement provides an assortment of and the most prospective estimates for each accrual;
- depreciation and amortization are excluded as these are irrelevant to value creation; and
- each presented line item is explained according to assumptions, risks and key performance indicators, which should be value-driven.

Value-driven companies should attempt to implement all of these principles in order to maximize value for shareholders and for the company. Incorporation of most, if not all, of these principles should be attempted when forming strategies and organizational design.
Step 3: Identification of value drivers

Value drivers which could ultimately result in increased shareholder returns and corporate affluence should be identified. These value drivers could be indicators for the specific industry or environment, which could be contributory factors to changes in costs and/or revenue. From an accounting perspective, three managerial accounting streams are mentioned as part of the measurement of these value drivers. These streams include activity-based costing (ABC), strategic cost management and the balanced scorecard, which is only mentioned for the purposes of this paper.

In order to understand value drivers, a company should identify those elements which could enable achievement of their organizational objectives. It is important to notice that value drivers will differ from company to company, as well as between industries, due to the uniqueness of each entity. For the purposes of this paper, value drivers for the Aviation Industry, specifically the entrepreneurial entity, is presented in the section on the Aviation Industry in South Africa. Although similar value drivers exist for the Aviation Industry in South Africa, the developed value drivers are unique, with differentiating characteristics according to the specific project.

Another definition, according to Knight (1998:167), states that value drivers are the operational factors with the greatest impact on financial and operational results. These are meaningful and actionable directives which could make strategy operational, as strategy is a holistic term. It is important to notice that value drivers are used to understand both financial and non-financial operating measures. Knight (1998:169-170) gives examples of operational value drivers in both the income statement, also known as the statement of revenue, and the balance sheet, also named the statement of financial position, as shown in Figures 2.2 and 2.3 below.
As mentioned, these are the operational value drivers that affect the income statement. With regard to the proposed project, the most important value drivers concerning the income statement were pricing, asset upgrades and utilization as well as operational costs. These income statement drivers relate to short-term value creation as the next part. The balance sheet's operational value drivers should contribute to long-term value creation. The most important balance sheet operational value drivers, with regard to the project, were asset utilization, disposal of non-performing assets, working capital management and financing decisions; the latter being the most important. Development of these value drivers could be beneficial, but by using these in decision-making and corporate processes, value maximization could be achieved. (Knight, 1998:168).

Source: Adapted from Knight (1998:169).

<table>
<thead>
<tr>
<th>Income Statement</th>
<th>Marketing/promotional activities</th>
<th>Sales approach</th>
<th>Pricing/discounting decisions</th>
<th>Customer/market segmentation</th>
<th>Product offering/mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Sales</td>
<td>$XX,XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of Sales</td>
<td>$XX,XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross Profit</td>
<td>$XX,XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG&amp;A</td>
<td>$XX,XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Profit</td>
<td>$XX,XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other income &amp; exp.</td>
<td>$X,XXX</td>
<td></td>
<td>Warranty servicing</td>
<td>Cash management</td>
<td>Asset utilization</td>
</tr>
<tr>
<td>Taxes</td>
<td>$XX,XXX</td>
<td></td>
<td>Strategic planning</td>
<td>Accounting methodologies</td>
<td>Tax sheltering</td>
</tr>
<tr>
<td>Net Income</td>
<td>$XX,XXX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 2.3: Examples of operational value drivers – The balance sheet

<table>
<thead>
<tr>
<th>Balance Sheet</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets:</strong></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$XX,XXX</td>
</tr>
<tr>
<td>Accounts Receivable</td>
<td>$XX,XXX</td>
</tr>
<tr>
<td>Inventories</td>
<td>$XX,XXX</td>
</tr>
<tr>
<td>Prepaid Expenses</td>
<td>$XX,XXX</td>
</tr>
<tr>
<td><strong>Net P,P&amp;E</strong></td>
<td>$XX,XXX</td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td>$XX,XXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term Debt</td>
<td>$XX,XXX</td>
</tr>
<tr>
<td>Accounts Payable</td>
<td>$XX,XXX</td>
</tr>
<tr>
<td><strong>Long-term Debt/Equity</strong></td>
<td>$XX,XXX</td>
</tr>
<tr>
<td><strong>Total Liabilities/Equity</strong></td>
<td>$XX,XXX</td>
</tr>
</tbody>
</table>

**Source:** Adapted from Knight (1998:170).

Malmu and Ikaheimo (2003:238) also confirm this observation by Knight (1998:168), and state that the implementation of VBM should lead to better decision-making within the organization. As the model for the aviation entity will be aimed at assisting in investment
decision-making, the implementation of VBM, including the identification of value drivers, is suggested to be considered by the entrepreneurial entity.

Koller (1994:90) define value drivers as any variable influencing the value of the company. Koller (1994:90) categorizes value drivers into 3 different levels. These are displayed in Figure 2.4 below. Level 1 consists of generic drivers which lack specificity, to be followed by bottom line levels. Examples of Level 1 drivers are sales growth, capital returns and operating margins. Level 2 value drivers apply to business-unit specific categories, for example customer mix, fixed cost allocations, etc. Level 3 drivers are used by the bottom line and are operational drivers, such as, unit revenues and cost per delivery. When comparing the business structure to the different levels, Level 1 should be utilized by top managers, Level 2 by middle management and Level 3 by employees.

**Figure 2.4: Levels of value drivers**

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2 Business-unit specific examples</th>
<th>Level 3 Operational (grass roots level) examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic</td>
<td>Revenue</td>
<td>Percentage of accounts revolving</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dollars per visit</td>
</tr>
<tr>
<td></td>
<td>Margins</td>
<td>Customer mix</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sales force productivity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(expense against revenue)</td>
</tr>
<tr>
<td>ROIC</td>
<td>Costs</td>
<td>Fixed cost/allocations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capacity Management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operational yield</td>
</tr>
<tr>
<td></td>
<td>Working capital</td>
<td>Unit revenues</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Billable hours to total payroll hours</td>
</tr>
<tr>
<td></td>
<td>Invested capital</td>
<td>Percentage of capacity utilized</td>
</tr>
<tr>
<td></td>
<td>Fixed capital</td>
<td>Cost per delivery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accounts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Receivable terms and timing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accounts payable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terms and timing</td>
</tr>
</tbody>
</table>

*Source:* Adapted from Koller (1994:91).
Young and O'Byrne (2001:272) categorize value drivers in two basic groups. The first group consists of components of EVA or financial drivers, while the second is made up of leading indicators of EVA or non-financial drivers. The author utilized these categories for distinction. The importance of financial drivers should be emphasized, but it must be remembered that non-financial drivers are also significant. This was portrayed through the study done by Ittner and Larcker (2001:373-374), who surveyed 148 financial service firms, where they studied the significance of non-financial performance categories. These categories consist of the following: financial, customer, employee, operational, quality, alliances, suppliers, environmental, innovation and community.

Figure 2.5 below indicates the outcome of the survey regarding these categories.

**Figure 2.5:** Perceived importance of non-financial performance categories

![Perceived Importance Chart]

**Source:** Adapted from Ittner and Larcker (2001:374).

The conclusions of the survey indicate that customer-related performance is more important to long-term success when the company has an innovative strategy. Another observation is that if the company pursues its current customer base in a relatively predictable market, the community becomes very important. This relates to the social welfare of the community, as a wealthier public will be more likely to become customers of the company. The last observation indicated that employee relations, quality, alliances, suppliers and innovation, have higher scores when associated with a malleable and inventive firm. In conclusion, customers are perceived to be of the utmost importance, with other factors like financial, employees, operational and quality also listed as very significant.
As explored by studies of value drivers, it is concluded that value drivers are essential variables when incorporating VBM. Choosing the most advantageous drivers for shareholders, as well as company wealth creation, is pivotal to the company’s success.

**Step 4: Developing action plans, selecting measures and setting goals**

Action plans should be developed according to the identified value drivers. The measures and goals should direct the company to calculate whether the action plans are successful or not. According to Koller (1994:98-99), performance measuring should become management-driven and not accounting-driven. Principles relating to performance measurement include the following:

- Performance measurement should be focused on the specific business unit. This entails that each unit should have unique performance measurements, as units are unique.

- Both short and long-term targets should be linked to performance.

- Financial and operating performances should be combined in the measuring process.

- As the financial indicators of measurement are based on historic figures, performance measures that could serve as early-warning indicators, in order to take corrective action, should be identified.

Koller (1994:99) also states that compensation design should follow, not lead, the implementation of a VBM system.

**Steps 5 and 6: Evaluate performance and reassess organizational objectives and plans**

If the results do not indicate positive shareholder growth after evaluation, objectives and plans should be revisited in order to take corrective action. The whole process should be re-examined. Assessment of VBM implementation is obtained by instigating VBM metrics, as discussed next. These metrics allow managers to compute possible value creation for shareholders and the company in the future.
In conclusion to this section, it is important to note that not all companies in respective industries will be obliged to follow all six steps, as industries are different. Studying these general steps might provide a broad framework for any company with the desire to implement a value-based management style.

2.3 VALUE METRICS

The goal of utilizing metrics is to generally discover the answer to the following question:

“Will the investment deliver returns higher than the cost of capital subjected to the investment?” If the answer is yes, then wealth has been created by the investment. In order to do such calculations, consulting firms have developed value metrics to assist companies with incorporating VBM systems. Although these metrics have been patented by these firms, all formulas in general answer the overall question mentioned. Ryan and Trahan (1999:47) summarize some of these metrics developed by consulting firms:

1) **Discounted Cash Flow (DCF), developed by LEK/Alcar Consulting Group**

   DCF can be formulized as the future cash flows discounted back to the present value at the company’s cost of capital. This figure is recognized as the market value of the company, which is linked to shareholder value. According to Young and O’Byrne (2001:22-23), discounting back to the present value, is according to a rate of return which indicates the perceived riskiness of the cash flows.

   **Equation 1: Discounted Cash Flow (DCF)**

   \[
   \text{Value} = \sum_{t=1}^{t=n} \frac{\text{CF}_t}{(1 + r)^t}
   \]

   Where:

   \(n\) = the economic life of the investment or asset (usually indicated in years);

   \(\text{CF}_t\) = the expected cash flow;

   \(t\) = the period; and
\( r \) = the discount rate, determined by the riskiness of the investment.

DCF metric is perceived as a value-based metric, as cash flows can be incorporated into a few value drivers, as discussed earlier. Young and O’Byrne (2001:23) indicate that the DCF equation indicates the sum of the discounted cash flows, with each cash flow being a function of (1) the nominal amount; (2) the riskiness of the asset; and (3) the timing of the cash flow. As all these elements point to a value based management approach, specifically to valuing the company, this metric will be deemed important for this study.

2) Cash Flow Return on Investment (CFROI) developed by BCG-HOLT

According to Ryan and Trahan (1999:47), CFROI indicates the percentage of cash financed for a specific asset, whereby cash flows are generated over a given period.

According to Young and O’Byrne (2001:382-383), CFROI as rate of return expresses the after-tax, inflation-adjusted cash flows available to investors, equated to the inflation-adjusted gross cash investments made by the investors. This ratio is then converted into a rate of return by appraising the economic life of depreciable assets and a residual value of non-depreciable assets. The author also suggests that CFROI is a real rate of return and not a nominal rate.

3) Return on Invested Capital (ROIC) developed by McKinsey & Co.

Ryan and Trahan (1999:47) define ROIC as a company’s Net Operating Profit Less Adjusted Taxes (NOPLAT), in relation to its invested capital, expressed as a ratio.

NOPLAT can be defined as the company’s net earnings before interest and taxes, less cash taxes. Invested capital can be computed by the sum of operating working capital, net fixed assets, and net other assets. This metric can be used in the calculation of the profitability of the company.
4) Economic Value Added (EVA) developed by Stern Steward & Co.

Young and O’Byrne (2001:34-35, 43, 162) describe EVA as a measure of performance with the following characteristics:

- divisional managers can utilize this metric as it can be calculated on a divisional level;
- EVA measures flow, not shares, and therefore performance evaluation is variable over periods of time; and
- promote the creation of shareholder riches. Calculations of EVA are shown in Equation 2 below.

**Equation 2: Economic Value Added (EVA)**

\[
EVA = \text{NOPAT} - (\text{Invested capital} \times \text{Cost of capital})
\]

Where:

**NOPAT** = Net Operating Profit after Tax;

**Invested capital** = the sum of a company’s financing, excluding short-term, non-interest bearing liabilities, such as accounts payable, accrued wages, and accrued taxes; and

**Cost of capital** = the expected rate of return an investor would expect to receive if the capital was invested in another comparable investment.

Young and O’Byrne (2001:162-163) note that the cost of capital is based on expected returns (thus not historical values), and that it is an opportunity cost as a result of comparable investment returns. Resulting from investors buying shares, compared to lending, the risk involved is higher, and therefore the expected return is higher. A company’s cost of capital is not only dependable on the cost of debt and equity financing, but also on its capital structure. The Weighted Average Cost
of Capital (WACC), captures this relationship and is calculated by Equation 3, adopted from Ryan (2007:175).

Equation 3: Weighted Average Cost of Capital (WACC)

\[
WACC = w_1 r_1 + w_2 r_2 + w_3 r_3 + \ldots + w_n r_n
\]

given that \( w_1 + w_2 + w_3 + \ldots + w_n = 1 \)

Where:
\( w_1 \) to \( w_n \) = different weights according to capital structure; and

\( r_1 \) to \( r_n \) = the effective rate of return that each investor should receive.

Equation 3: Weighted Average Cost of Capital (WACC)

Simplified:

\[
WACC = r_e - w_d (r_e - r_d)
\]

Where:
\( r_e \) = return on equity; \( w_d \) = weight of debt; and
\( r_d \) = return on debt.

Equation 3 above is only a general calculation which has been utilized by the author to construct the decision framework. Hartman (2000:158) defines EVA as a metric tool enabling comparisons between companies’ operating profits against their cost of capital. According to Hartman (2000:158) EVA can be employed for various uses, which include performance evaluation, compensation, bonus packages measurement and capital budget decision, but also for investment as well as acquisition and merger decisions. For the purposes of this paper, EVA has been utilized to assist in investment decisions, which ultimately predicts whether shareholder wealth could be created.
Ryan and Trahan (1999:48) specify that all of these firms have used these metrics by relating them upwards to shareholder value and downwards to value drivers. Although all of these metrics are developed by different entities, they all have one perspective in common, namely evaluation of wealth conception. Other VBM metrics also exist, but for the purposes of this paper, only the above-mentioned have been used for constructing a financial decision-making model.

2.4 VALUATION FROM A VALUE-BASED MANAGEMENT PERSPECTIVE

Incorporated in the decision-making model, is a valuation approach, consistent with the usefulness of this approach. Ryan (2007:357) indicates that there are four approaches which could be used for valuation purposes. These four approaches, namely asset-, relative, flow and contingent valuation, are illustrated in Figure 2.6 below.

By studying the resolution of each approach, the flow valuation method proved to be the most applicable methodology for this study, and therefore it is discussed further. Any investor would like to estimate possible returns from an investment. The return should consist of possible gains or losses from capital returns, usually in the form of dividends for a specific period. A dividend valuation model resides under a flow valuation, as expected dividends are received during intervals. According to Megginson et al. (2010:133), three possible scenarios for dividend growth exist, namely zero, constant and variable growth models. These are discussed next.
2.4.1 ZERO GROWTH MODEL

The zero growth model assumes a perpetual dividend flow. Dividends payable should be the same for each period. According to Megginson et al. (2010:133), the zero growth model is the simplest method of valuing dividends and is applicable to the calculation of the present value, if no growth is expected. Equation 4 illustrates the formula for this model.

**Equation 4: Zero growth model for the valuation of dividends**

\[
P_0 = \frac{D}{r}
\]

Where:

- \(P_0\) = Present value of perpetuity;
- \(D\) = Dividend payment; and
- \(r\) = Return on investment.
As indicated by the equation, the dividend payment is divided by the return rate in order to establish the present value of the investment. As the growth amounts to zero, this factor is omitted in the equation. Investors will normally not pursue zero growth investments, thus this model has not been utilized as a valuation model for this study.

2.4.2 CONSTANT GROWTH MODEL

During the 1960s and 1970s, Myron Gordon formulized the constant growth model for valuation of dividend purposes (Megginson et al., 2010:134). The foundation of this model is manifested in the growth rate \((g)\) being constant over time. Equation 5 below exemplifies this model.

Equation 5: Constant growth model for the valuation of dividends

\[
P_0 = \frac{D_1}{r-g}
\]

Where:

\(P_0\) = Value of today’s stock, that pays a dividend at a constant rate;

\(D_1\) = Next year’s dividend;

\(r\) = Rate of return;

\(g\) = RR x ROE (growth rate)

\(RR\) = Retention rate;

\(ROE = \frac{\text{Earnings available for common stockholders}}{\text{Common stock equity}}\) = Return on equity.

According to the literature on the Aviation Industry in SA, this model of constant growth for the valuation of dividends can be utilized, as a constant growth rate of 14% for the next three years is predicted.
2.4.3 THE VARIABLE GROWTH MODEL

According to Megginson et al. (2010:135), this model could be significant if the company experiences varied stages of growth over time. As the prediction for the Aviation Industry in South Africa is of a constant rather than a variable growth, this model will also be disregarded for the purposes of this study, but is mentioned for the sake of completeness of the different models available. Equation 6 below illustrates the multiple sections of the calculation, with applicable descriptions for each segment.

**Equation 6: Variable growth model for the valuation of dividends**

\[
P_0 = \frac{D_0 (1+g_1)^1}{(1+r)^1} + \frac{D_0 (1+g_1)^2}{(1+r)^2} + \ldots + \frac{D_0 (1+g_1)^n}{(1+r)^n} + \left[ \frac{1}{(1+r)^n} \times \frac{D_{n+1}}{r-g_2} \right]
\]

Where:

- \(P_0\) = Value of stock today that pays a dividend at a variable rate;
- \(D_0\) = The last or most recent per share dividend paid;
- \(r\) = Rate of return;
- \(g\) = RR x ROE (growth rate);
- \(RR\) = Retention rate; and
- \(ROE\) = \(\frac{\text{Earnings available for common stockholders}}{\text{Common stock equity}}\) = Return on equity.

As indicated by Equation 6 above, the first part exemplifies the initial growth period, whilst the second part is calculated by using the constant growth model, thus being a...
combination of variable and constant growth. Businesses have growth cycles they endure from the initial starting point of the business to a point of inundation, where after a decline in growth starts; this model could be utilized for that purpose.

2.5 INVESTMENT DECISION AND CAPITAL BUDGETING IN CONTEXT OF VALUE-BASED MANAGEMENT

Investors making decisions regarding new ventures, should be enabled to, with some uncertainty, envision whether the project will be financially viable or not.

Investors should be able to make decisions regarding investments in new ventures, and be able to, with some uncertainty, envision whether the project will be financially viable or not. The aviation entrepreneurial entity considered engaging in capital investments over long periods of time. To assist this entity with effective decision-making tools regarding the proposed investments proves to be the main goal of this paper. Capital budgeting, as discussed further on, served as a gateway for reaching this goal.

2.5.1 INTRODUCTION

According to Megginson et al. (2010:232), capital budgeting has been identified as the process by which certain new projects are identified by the company. The process involves three steps, namely (1) identification of possible new investments; (2) analysing the investments and selecting the ones which will create shareholder value and prioritize those; and (3) implementation and observation of selected projects. Step two should employ the usage of basic techniques, thus it is labelled Discounted Cash Flow (DCF) techniques. DCF techniques incorporate the Time Value of Money (TVM), which implies that $1 today will not have the same value as $1 a year from now, as a result of inflationary effects (Burke, 2001:56). Three different DCF techniques are discussed next, which are Net Present Value (NPV), Internal Rate of Return (IRR) and Modified Internal Rate of Return (MIRR). Although there are other techniques, these are the most significant in the context of VBM.
2.5.2 NET PRESENT VALUE (NPV)

Any new investment presents a level of riskiness to the investor. According to Megginson et al. (2010:155), the decision-making process regarding a risky asset involves three basic steps. These steps are: (1) establishing the project’s cash flows; (2) selecting an appropriate discount rate accordingly to the investment’s risk; and (3) computing the Present Value (PV). The NPV is defined as the sum of the project’s cash inflows and outflows, discounted at a rate consistent with the project’s risk (Megginson et al., 2010:238). An important rule governs NPV, namely only invest in the project if the NPV is greater than zero. Any investments made in projects with a NPV smaller than zero could result in a loss and will be inconsistent with the overall objective of creating shareholder value. The general equation for NPV is illustrated next.

\[
NPV = CF_0 + \frac{CF_1}{(1 + r)^1} + \frac{CF_2}{(1 + r)^2} + \frac{CF_3}{(1 + r)^3} + \frac{CF_n}{(1 + r)^n}
\]

Where:

\(CF_t\) = net cash flow in a year

\(t\); \(r\) = discount rate; and

\(n\) = life of the project.

Kendrick (2009:247-248) indicates that the NPV contains all costs and benefits associated with the project throughout the life time of the asset. The overall expected return of the investment is established through NPV, which usually favours the larger projects rather than the smaller ones. In context of the financial decision framework, the NPV is calculated according to relevant inputs, where after the project will be either accepted or rejected.
2.5.3 INTERNAL RATE OF RETURN (IRR)

Young and O'Byrne (2001:26) define the IRR as the interest yield expected from an investment or project, expressed as a percentage. Megginson et al. (2010:245) suggest a few steps in calculating the IRR of any project. The first step is to determine the cash flows of the project. Using a financial calculator or spreadsheet, the discount rate is determined where the PV of the cash flows is zero. Next, a hurdle rate is determined, which is the minimum acceptable return rate for the company. The rule of IRR specifies that if the IRR surpasses the hurdle rate, the project may be accepted by the company, and vice versa. Calculation of the IRR does have an undesirable side, namely when a project has unusual cash flows, the calculation can produce multiple IRRs. This problem could however be overcome by using the Modified Internal Rate of Return (MIRR), as explained below.

2.5.4 MODIFIED INTERNAL RATE OF RETURN (MIRR)

Ryan (2007:43-44) explains the MIRR as the assumption that the cash flows from the project, excluding the initial investment, are reinvested at the company’s chosen hurdle rate. As explained earlier, the problem of multiple IRRs is solved by using MIRR, as only a single rate is calculated. In order to explain the calculation of MIRR, the terminal value is explained. Megginson et al. (2010:73) define terminal value (TV) as the future value of any stream of cash flows, measured at the end of a specific period. This terminal value is calculated as the sum of the future values of the individual cash flows at the end of the period. Equation 8 below illustrates the equation for MIRR, according to Ryan (2007:46).

\[
\text{MIRR} = \left( \frac{\text{Terminal value of project cash flows}}{\text{Percentage value of investment outlay}} \right)^{\frac{1}{n}} - 1
\]

Where:

\( n \) = the number of years to the completion of the project.

31
Ryan (2007:46) also indicates that the MIRR is preferable to the IRR, as stronger assumptions are made concerning the reinvestment rate. For reinvestment purposes, MIRR values are more pessimistic and realistic than IRR.

2.5.5 RELATIONSHIP BETWEEN NET PRESENT VALUES (NPV), INTERNAL RATE OF RETURN (IRR) AND MODIFIED INTERNAL RATE OF RETURN (MIRR)

Figure 2.7 below represents a NPV profile, which plots various discount rates for a project (on the x-axis) against the NPV (on the y-axis) (Megginson et al., 2010:245). This illustration presents itself as an inverse relationship between the NPV and the discount rate used to calculate NPV. As the NPV declines, the discount rate increases. At some point the NPV will equal zero. This point will represent the project’s IRR.

Figure 2.7: NPV Profile

Source: Adapted from Megginson et al. (2010:245).

Many deliberations have occurred concerning which DCF technique to use when evaluating possible projects. Osborne (2010:234) explains that financial practices have not yet caught up with theory. IRR is often used as a result of comparison with the cost
of capital. Many big companies use both methods for certainty. Osborne (2010:238) concluded that NPV is a better concept than IRR, because NPV uses any possible difference between IRR and cost of capital, whilst IRR only uses a part of TVM equation. Tang and Tang (2003:69,71) indicate that the IRR is perceived to be a financial indicator, whilst the NPV is an economic indicator; therefore it is suggested that the IRR is beneficial from the investor’s point of view, whilst the NPV is beneficial from the society’s viewpoint. This paper will consider the NPV because of the magnitude of the project, together with the MIRR as the rate of return, as unusual cash flows are expected.

2.6 AVIATION INDUSTRY

In order to be more specific to industry fundamentals, the international scene has been explored first, where after the South African Aviation Industry was studied. Though the developed model was mainly for the South African boundaries, it could be utilized, after some small adjustments, in the rest of Africa.

2.6.1 INTERNATIONAL AVIATION INDUSTRY

In order to illustrate a bigger picture of the Aviation Industry, the international scenario was studied. The International Aviation Industry (IAI) is a growing industry with an increasing demand through the effects of globalization. A body established in 1919, named the International Air Traffic Association (IATA), ensures that collaboration amongst scheduled airlines exists. The IATA has 280 airlines from 130 countries under its wing, which account for approximately 95% of the world’s scheduled air traffic. Accreditation of global travel agents is performed by this body, except for the US agents, which are accredited by the Airline Reporting Corporation (Businessdirectory:n.d.).

- The 1st of January 2014 marked the 100th anniversary of the commercial aviation industry. According to Johanson (2014:2), on 1 January 1914, one test pilot named Tony Jannus, flew Thomas Benoist’s wood-and-muslin “Flying Boat No. 43” across Tampa Bay. Since it had one paying passenger, named Abram Phell, then mayor of St. Petersburg, on board, the commercial Aviation Industry resulted from this flight. Abram paid $400 for being the first passenger on board of a flight, where after
passengers paid $5 each for the same trip, from St. Petersburg to Tampa, an airboat line of approximately 18 miles.

- From 1926 to 1993 the industry grew from 6000 passengers to nearly half a billion passengers. During 1993 it escalated from flying 1 million passenger miles per year at $1 per mile to flying nearly half a trillion passenger miles at 13 cents per passenger mile (Morrison & Winston, 1995:3, 6). During 1978 the Airline Deregulation Act made the industry more competitive and profitable, as more new companies could enjoy the freedom of taking to the skies according to their own routes (Morrison & Winston: 1995: 4).

Current statistics indicate that a total of nearly 3.1 billion passengers during 2013 and transporting about 50 million tons of cargo each year, valuing $6.4 trillion, the Aviation Industry was utilized by nearly 44% of the world’s population during 2014. A turnover on a global scale for the AI is expected to be $743 billion in 2014, with a net profit margin of 2.6% (IATA:2013). As the framework for this study was developed mainly for the South African Aviation Industry (SAAI), this industry is briefly discussed.

2.6.2 SOUTH AFRICAN AVIATION INDUSTRY (SAAI)

Industry associations affiliated with South African Aviation Industry (SAAI) includes the International Air Traffic Association (IATA), the International Air Carriers Association (IACA) and the South African Civil Aviation Authority (SACAA) (Marketline, 2012:25-26). In order to get a better understanding of the SAAI, an overview of the industry is presented.

2.6.2.1 OVERVIEW OF THE SOUTH AFRICAN AVIATION INDUSTRY (SAAI)

The South African Aviation Industry (SAAI) is a growing industry with more and more people flying on a daily basis. Target markets for potential passengers could include business people, tourists and citizens going on holiday. Benefits of air travel as opposed to road travel, may include spending less time and being more comfortable while traveling. Disadvantages could include higher passenger prices, depending on the service, as well as parking fees for the vehicle left behind at the airport. Studying the impact on the bottom line, development of a short distance commuter route between
smaller airports in SA could prove to be advantageous for the economy and society, as current major airports experience congested traffic. The impact on the environment is however unknown and could be a subject for another paper.

Investigating only the passenger air transportation in SA, including both chartered and scheduled flights, the industry volume showed a decline in passengers from 2007 to 2011, with the lowest amount of passengers (14.3 million) during 2009. This could be as a result of the recession during 2009. The economy is still recovering from the recession today.

See Table 2.1 below for figures made available by Marketline (2012:6).

**Table 2.1:** South Africa airlines industry volume - million passengers, 2007–2011

<table>
<thead>
<tr>
<th>YEAR</th>
<th>MILLION PASSENGERS</th>
<th>% GROWTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>15.8</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>14.6</td>
<td>(7.2%)</td>
</tr>
<tr>
<td>2009</td>
<td>14.3</td>
<td>(2.3%)</td>
</tr>
<tr>
<td>2010</td>
<td>15.1</td>
<td>5.4%</td>
</tr>
<tr>
<td>2011</td>
<td>15.4</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

CAGR (2007-2011) -0.6%

**Source:** Marketline (2012:6).

A reduction in residual income and the fluctuating fuel prices could be blamed for the downward movement in passenger figures. A compound annual growth rate of -0.6% was recorded for the period 2007 to 2011. This decline in passengers was also present in the industry value for the same period. The industry showed a total revenue of $4.1 billion in 2011. See Table 2.2 below for the market value for the years 2007 to 2011. A CAGR of negative 1.6% was recorded for the period 2007–2011 (Marketline, 2012:5).
Table 2.2: South Africa Airlines industry values - $ million, 2007-2011

<table>
<thead>
<tr>
<th>YEAR</th>
<th>$ MILLION</th>
<th>ZAR MILLION</th>
<th>€ MILLION</th>
<th>% GROWTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>4429.3</td>
<td>32029.8</td>
<td>3183.8</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>4551.4</td>
<td>32912.4</td>
<td>3271.5</td>
<td>2.8%</td>
</tr>
<tr>
<td>2009</td>
<td>3818.2</td>
<td>27610.6</td>
<td>2744.5</td>
<td>(16.1%)</td>
</tr>
<tr>
<td>2010</td>
<td>3843.3</td>
<td>27792.1</td>
<td>2762.6</td>
<td>0.7%</td>
</tr>
<tr>
<td>2011</td>
<td>4145.5</td>
<td>29977.3</td>
<td>2979.8</td>
<td>7.9%</td>
</tr>
</tbody>
</table>

CAGR (2007-2011) -1.6%

Source: Marketline (2012:5)

As depicted by Figure 2.8, the outlook for the years 2012–2016, regarding industry value is as follows:

- a forecast for 2016, with a volume of 16.5 million passengers and an increase of 6.7% since 2011; and

- a valuation prediction for 2016, with a value of $7424.7 million and an increase of 79.1% since 2011 (Marketline, 2012:2). The Industry projects a growth rate of 14% for the next three years; thus 2013–2015.

Figure 2.8: South-Africa Airlines Industry value forecast - $ million, 2011-2016

Source: Adapted from Marketline (2012:8).
Concluding this section regarding the overview of the SAAI, positive expectations for the next three years include a 14% constant growth rate. During the design of the decision framework for an aviation entity that considers operating within this environment, these expectations were taken into account.

2.6.2.2 BUSINESS MODEL

Model development for any company is challenging, especially where innovative ideas are considered. In order to develop a model, a basic framework is established which aims to provide a basic guideline for the entrepreneurial entity requiring assistance.

Defining a business model seems challenging, as no general accepted definition has been developed. According to Morris et al. (2005:726), the confusion appears when terminology like business model, strategy, business concept, revenue model, and economic model are used interchangeably. Key words from 30 definitions for “business model” enabled authors to categorize the key words into three categories, namely economic, operational and strategic. Each of these contains an inimitable set of variables. Morris et al. (2005:729-730) developed an integrative framework for model development, which consists of three levels of decision-making. These levels include the ‘foundation’, ‘proprietary’ and ‘rules’ levels. At each level, six basic component areas were developed for decision-making. The foundation level portrays basic decisions, of entrepreneurs, and of what the business is all-about. The proprietary level indicates possible combinations of decision variables for obtaining market share and a competitive advantage. The last level, which is the rules level, provides guidance and discipline for execution of the decisions made at level one and two. It is suggested that the entrepreneurial entity should aim to embark on a low-cost model. The reason for a low-cost model is the short distances which passengers will be transported and the limited amount of seats available, namely only 24 seats. According to the integrative framework developed by Morris et al. (2005:730), the author suggested a possible framework for a business model for this entity, as indicated in Table 2.3 below.
## Table 2.3: Proposed business model for aviation entity

<table>
<thead>
<tr>
<th>Components</th>
<th>Foundation level</th>
<th>Proprietary level</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 1: “How do we create value?” Factors related to the offering.</td>
<td>-Passenger and/or cargo transportation. -Online ticket distribution. -Standardized offerings. -Beverages offered at extra costs to passengers. -Direct distribution.</td>
<td>-Low competitive fares and rates with high frequency. -No travel agents. -Non-stop short distance with no first class. -Low-cost model contains costs. -Refundable tickets.</td>
<td>-Fares should be calculated with at least a 25% mark-up rate from costs.</td>
</tr>
<tr>
<td>Component 2: “Who do we create value for?” Market factors.</td>
<td>-Possible markets: -Businesses (B2B) -Tourism and leisure(B2C). -Cargo distributors.</td>
<td>-Routes of approximately 500km between smaller airports in SA.</td>
<td>-Infrastructure of available smaller airports in SA to be examined.</td>
</tr>
<tr>
<td>Component 3: “What is our source of competence?” Internal capability factors.</td>
<td>-Innovative capability. -Operating systems.</td>
<td>-Innovative design of aircraft enabling both cargo and passenger loading. -Smaller airports with minimum traffic.</td>
<td>-Minimum departures per day to be set. -Maximum flight distance should be less than 550km. -Maximum flight time should be set. -Turnaround time of flights should be set. -Conversion time from passenger loading to cargo loading should be set.</td>
</tr>
<tr>
<td>Component 4: “How do we position ourselves competitively?” Competitive strategy factors.</td>
<td>-Excellence in service delivery to remote places. -Transformation from passenger loading to cargo loading, innovating strategy.</td>
<td>-Availability of services to remote places will improve market advantage. -Differentiation reached via the ability to transport passengers and cargo with a quick turnaround time.</td>
<td>-Achieve maximum departures per day. -Achieve minimum turnaround time, even when transformation from passengers to cargo occur.</td>
</tr>
<tr>
<td>Component 5: “How do we make money?” Economic factors.</td>
<td>-High volumes. -Reduced cost.</td>
<td>-Competitive fares. -High frequency of services. -Cargo and passenger loading with short turnaround time makes it economical.</td>
<td>-Standard to be set regarding maximum cost per passenger/cost per package.</td>
</tr>
<tr>
<td>Component 6: “What is our time, scope, and size ambitions?” Growth/exit factors.</td>
<td>Growth model</td>
<td>Opportunities for growth should be investigated on an on-going basis.</td>
<td>Managed growth rate.</td>
</tr>
</tbody>
</table>

As indicated, this is only a suggested framework for the aviation entity, for the purpose of developing a business model. Although this paper only focussed on Component 5, regarding the economic factors, the other components could be subjects for other papers.
The framework should be shaped according to low-cost models as known in the AI. The following are some of the characteristics of low cost models as indicated by Francis et al. (2006:84): (1) high aircraft utilization; (2) Internet booking; (3) use of secondary airports; (4) minimum cabin crew; (5) lower wages; (6) one class of seating; (7) no seat allocation; (8) passengers having to pay for meals; and (9) flexible working terms and conditions. It was suggested by the author to the entrepreneurial entity that all characteristics mentioned, were suitable for the presented case study.

2.6.2.3 PERFORMANCE MEASUREMENT TECHNIQUES IN CONTEXT OF THE AVIATION INDUSTRY

Leading up to the identification of value drivers of the AI in South Africa, a study concerning performance measurement techniques was explored. Francis et al. (2005:208) examined the usage of operational and financial performance measures from the largest 200 airlines as ranked by Air Transport World for the year 2001. The geographic profile of the respondents to the sample is indicated in Table 2.4 below.

Table 2.4: Geographic profile of the respondents and the sample

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage of Sample airlines (N=196)</th>
<th>Percentage of respondent airlines (N =43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>37</td>
<td>52</td>
</tr>
<tr>
<td>North America</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>Asia/Pacific</td>
<td>23</td>
<td>16</td>
</tr>
<tr>
<td>Latin America/Caribbean</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Africa/Middle East</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

Source: Adapted from Francis et al. (2005:209).

It is apparent from Table 2.4 that a total of 9% of the respondents from this study was from Africa or the Middle East. The results of the study indicated the usage and knowledge of certain operational performance measures utilized by the different respondents. These are indicated in Table 2.5 below.
Table 2.5: Operational performance measures

<table>
<thead>
<tr>
<th>OPERATIONAL PERFORMANCE MEASURE</th>
<th>USED (%)</th>
<th>NOT USED (%)</th>
<th>DON'T KNOW</th>
<th>USEFULNESS OF MEASURE*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S_b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punctuality/on-time performance per operation</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>4.6</td>
</tr>
<tr>
<td>Revenue passenger kilometres</td>
<td>95</td>
<td>5</td>
<td>0</td>
<td>4.2</td>
</tr>
<tr>
<td>Load factor per flight</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>4.5</td>
</tr>
<tr>
<td>Average fleet age</td>
<td>80</td>
<td>17</td>
<td>3</td>
<td>3.0</td>
</tr>
<tr>
<td>Available seat kilometres</td>
<td>93</td>
<td>7</td>
<td>0</td>
<td>4.2</td>
</tr>
<tr>
<td>Available tonne kilometres per employee</td>
<td>49</td>
<td>49</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Average turnaround time</td>
<td>76</td>
<td>21</td>
<td>3</td>
<td>4.1</td>
</tr>
<tr>
<td>Labour cost as a % of total operating cost</td>
<td>87</td>
<td>11</td>
<td>2</td>
<td>3.9</td>
</tr>
<tr>
<td>Cost per seat kilometre</td>
<td>90</td>
<td>8</td>
<td>2</td>
<td>4.7</td>
</tr>
<tr>
<td>Daily aircraft utilization (hours)</td>
<td>98</td>
<td>0</td>
<td>2</td>
<td>4.3</td>
</tr>
<tr>
<td>Total revenue per work load unit</td>
<td>43</td>
<td>40</td>
<td>17</td>
<td>4.5</td>
</tr>
<tr>
<td>Other</td>
<td>78</td>
<td>11</td>
<td>11</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Scale 1 = not useful to 5 = very useful. S_b = standard deviation

Source: Adapted from Francis et al. (2005:212).

As indicated by the results, on-time performance per operation and load factor per flight were used by all the respondents as operational performance measures, with a standard deviation of 0.9 and 1.0 respectively, whilst total revenue per work load unit was used by only 43%.

Revenue passenger kilometres were utilized by 95% of the respondents, with a standard deviation of 1.1. Results concerning financial performance measures are revealed in Table 2.6 and the graphical display of the use and potential uptake of financial performance indicators can be seen in Figure 2.9 below.
Table 2.6: Financial performance measures

<table>
<thead>
<tr>
<th>OPERATIONAL PERFORMANCE MEASURE</th>
<th>USED (%)</th>
<th>NOT USED (%)</th>
<th>DON'T KNOW</th>
<th>USEFULNESS OF MEASURE*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Sr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating costs</td>
<td>95</td>
<td>0</td>
<td>5</td>
<td>4.8</td>
</tr>
<tr>
<td>Cash flow</td>
<td>95</td>
<td>0</td>
<td>5</td>
<td>4.4</td>
</tr>
<tr>
<td>Operating revenue</td>
<td>93</td>
<td>2</td>
<td>5</td>
<td>4.5</td>
</tr>
<tr>
<td>Profit</td>
<td>93</td>
<td>2</td>
<td>5</td>
<td>4.7</td>
</tr>
<tr>
<td>Return on capital employed</td>
<td>81</td>
<td>11</td>
<td>8</td>
<td>4.2</td>
</tr>
<tr>
<td>Gearing (debt to equity ratio)</td>
<td>76</td>
<td>11</td>
<td>13</td>
<td>3.9</td>
</tr>
<tr>
<td>Revenue to expenditure ratio</td>
<td>75</td>
<td>17</td>
<td>8</td>
<td>4.1</td>
</tr>
<tr>
<td>Price earnings (P/E) ratio</td>
<td>49</td>
<td>43</td>
<td>8</td>
<td>3.6</td>
</tr>
<tr>
<td>Share price</td>
<td>46</td>
<td>46</td>
<td>8</td>
<td>3.5</td>
</tr>
<tr>
<td>Earnings per share</td>
<td>38</td>
<td>54</td>
<td>8</td>
<td>3.6</td>
</tr>
<tr>
<td>Other</td>
<td>75</td>
<td>0</td>
<td>25</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Scale 1 = not useful to 5 = very useful. Sr = standard deviation

At the top of the list of financial performance indicators used, are operating costs and cash flow, with a 95% usage and a 0.6 and 0.9 standard deviation respectively. Francis et al. (2005:212) explains that these financial indicators were the most traditional profit-based measures. As only 46% of the respondents had privately owned operations and 54% had a government stake in ownership, investor ratios like Earnings` Per Share (EPS), had the lowest percentage of use, with a 1.2 standard deviation. This is important to the study as it implies that government stakeholders of aviation entities are not so focused on creating shareholder value, as opposed to privately owned companies.
As indicated in Figure 2.9, EVA was used by 40% of respondents with another 20% of the respondents considering the use of EVA. SVA was used by 30% of respondents with another 20% considering the use of SVA. Concluding this section, it is obvious that the utilization of value-based management tools by aviation companies, for example EVA, is still limited, as the most popular performance measures were the traditional operating cost and cash flow. The development of the decision model however included EVA, as well as SVA as metrics.

**2.6.2.4 VALUE DRIVERS FOR THE AVIATION INDUSTRY IN SOUTH AFRICA**

Considering the above-mentioned study on financial performance indicators, attention now shifts to the value drivers, as discussed in the value-based framework (2.2.4). This section is divided into two parts. Firstly, a study done by Malighetti *et al.* (2011:363) to determine the value drivers for the AI in general, in order to sketch a bigger picture. Secondly, a specific illustration of value drivers for the Aviation Industry, specifically for the entrepreneurial entity, is revealed.

Research done by Malighetti *et al.* (2011:363) investigated 24 airports and 87 airline companies listed worldwide, according to the financial data at the end of 2007. The
researchers tested various value drivers – financial and non-financial - as well as ownership structure and industry specific variables, in order to discover the impact of these drivers on firm valuation. These value drivers are illustrated in Figure 2.12 below.

Empirical results from the research are as follows (Malighetti et al., 2011:367-368):

- In consideration of the AI in totality, valuation is positively impacted by a high ownership concentration, whilst the size and state of ownership are negative variables.

- In respect of the airport section, firm size, profitability, passenger growth and leverage, all were found to be positive variables with regard to valuation.

- Focusing on airlines, the number of routes had a negative coefficient. This is explained by the fact that it is important to supply a number of connection flights at international level, but if the load factor is not high enough, it could be unprofitable.

- The main determinants of airline valuation were the following financial ratios:
  - EBITDA margins (Earnings Before Interest, Taxes, Depreciation and Amortization);
  - performance ratios;
  - sales to fixed asset ratio; and
  - capital expenditure.
Figure 2.10: Value drivers for the Aviation Industry, according to Mallighetti et al. (2011:361).

**VALUE DRIVERS**

**FINANCIAL INFORMATION**
- Revenues
- Revenue growth
- EBITDA margin
- EBITDA margin growth
- Return on equity
- Return on invested capital
- Leverage
- Beta
- Cash flows
- R&D expenses

**NON-FINANCIAL INFORMATION**
- Ownership structure
  - Pyramidal ownership
  - Ownership concentration
  - Owner identity: state, widely held financial corporation, family

**INDUSTRY SPECIFIC MEASURES**
- Airports
- Airlines
- Passenger
- Passenger growth
- Aviation non-aviation revenues
- Number of operated airports
- Number of served airlines
- Airlines concentration
- Low-cost ratio
- Number of routes
- Average steps within 100km

**OTHER CONTROL VARIABLES**
- Airport vs. airline dummies
- Firm age
- Firm age from the IPO
- Firm size (alternative measures to revenues: employment total assets)
- Firm country (dummies, income levels, etc.)
- M&A activity (dummies and counters)
- Dividend distribution dummy

Source: Adapted from Malighetti et al. (2011:361).
- Passenger load factor was the only industry-relevant variable to valuation.

- Verification was done that low-cost carriers received higher valuations from financial markets, which was of specific interest to this study, as the proposal to the entrepreneurial entity was to follow a low-cost model.

- Firm age was a negative variable to valuate, thus any new company could have a valuation equal to “old” companies.

Results regarding low-cost carriers should motivate the entrepreneurial entity to incorporate the characteristics of low-cost carriers in the company’s business plan. Critique to the study from Malighetti et al. (2011:367-368) is the usage of financial ratios based on past events. No forward-looking methods were used as advocated by this paper. The research done by Malighetti et al. (2011) was for the International Aviation Industry (IAI), and therefore its results were only incorporated partly for the decision framework, as no such study has been done for the SA market before. This concludes the first part of the section regarding value drivers in general.

Specific value drivers for the entity considered are illustrated in Figure 2.11 below. Distinction is made between financial and non-financial value drivers and is discussed accordingly.

### 2.6.2.4.1 Financial Value Drivers

- **Passenger growth**

  Passenger growth has a direct impact on revenue, as profit margins and cash flow increase. Prospective passenger growth may be targeted at 14% on an annual basis, according to the expected growth statistics of the industry.

- **Passenger load factor**

  The passenger load factor is directly linked to increased revenues and profits. If more seats are occupied per flight, it indicates higher revenues and cash flows. The same applies to cargo load factor, in the event of transfiguration to freight loading.
Figure 2.11: Value drivers for the South African Aviation Industry (SAAI)

**FINANCIAL VALUE DRIVERS**
- Passenger Growth
- Passenger Load Factor
- Growth in Freight Transportation
- Average Route Frequency
- Transition Period (From Passenger to Cargo)
- Turnaround Time
- Competitive Routes
- On-Time Arrivals
- Efficient Fuel Consumption

**NON-FINANCIAL VALUE DRIVERS**
- Ownership
- Safety
- Competent Personnel
- Efficient Infrastructure
- Number of Aircraft in Fleet

**IMPACTING ON:**
- Customer Satisfaction
- Revenue
- Operational Costs
- Cash Flow from Operations
• **Growth in freight transportation**

Higher volumes of freight transportation will lead to augmented profitability and cash flow. The same applies to the increased load factor per flight.

• **Average route frequency**

A higher average route frequency results in higher profits and cash flow. Passenger satisfaction can also be increased if more flights are available. One should however be careful with too high a frequency of a particular flight, as this could result in a lower passenger load factor, which could negatively affect revenues.

• **Transition period (from cargo to passenger)**

Time means money, thus the shorter the transition period, the more flights will take place daily, resulting in higher revenue as well as increased passenger satisfaction.

• **Turnaround time**

The shorter the turnaround time between flights, the higher the revenue should be. The transition period between passenger and cargo loading should be relatively quick to minimize turnaround time, as turnaround time could be considered as a sunk cost.

• **Competitive routes**

Fewer competitive routes will allow for increased passengers and a positive impact on profitability. Making a specific route available for the average passenger, where no other airline does, could attract passengers to make use of the service.

• **On-time arrivals**

On-time arrivals will mean happier clients as well as more frequent flights with positive effects on revenue and cash flow.

• **Efficient fuel consumption**

Pilots should be rewarded for efficient fuel consumption as this will decrease operational costs due to fuel savings.
2.6.2.4.2 Non-Financial Value Drivers

- **Ownership**

  Ownership depends on privately owned companies and/or government stakeholder involvement. Privately owned companies usually aim at shareholder and/or general wealth enhancement as an objective, thus striving to improve all value drivers mentioned so far. Ownership versus leasing also portray differences, as ownership of a fleet of aircraft improve valuation of the entity, whilst leasing has the advantage of side-stepping depreciation costs (sunk cost), as well as in some cases, save on insurance costs. In order to study the impact that owning a fleet of aircraft versus leasing one will have on the adoption or rejection of the project, it has been made available as an input in the decision framework for purposes of better decision-making.

- **Safety**

  Safety should be one of the main considerations in any aviation project. The safer the passengers feel when flying, the better their faith in the airline, resulting in a growth in patrons.

- **Competent personnel**

  Human capital is one of the biggest expenses in any business, but also one of the most important, especially in a service industry. Competency of especially the flight crew should be one of the key value drivers for any aviation company.

- **Efficient infrastructure**

  Infrastructure should be efficient for the effective flow of operations. It is very important to have access to airports where the aircraft can be stored at a reasonable price.

- **Number of aircraft in fleet**

  This value driver seems obvious, as the higher the number of aircraft in the fleet, the more flights can occur, resulting in higher profit margins. This has been tested in the financial framework as an input in order to see how many aircraft purchased will result
in the project being accepted, as well as at which number of aircraft the project will be rejected.

### 2.6.2.5 VALUATION FOR THE CASE STUDY

Ownership of the company, thus selling compared to leasing of a fleet, could also have an impact on the valuation. Another dynamic to be considered is the leverage factor of the company in computing the WACC. According to Megginson et al. (2010:319), a levered firm will earn higher returns for its shareholders during financial good times, than an unlevered firm. The opposite is also true during financial distress.

Valuation could be effectively implemented by incorporating the DCF-approach to value the project. As the DCF-approach is a value-based approach, TVM, riskiness of the project and nominal values are incorporated. Valuation of the dividends for this study was done according to the constant growth model illustrated in 2.4.2. According to the predictions of the Aviation Industry, the growth rate should be a constant 14% over the next three years. For this reason this model of valuing the dividends was utilized.

### 2.7 SUMMARY TO CHAPTER 2

By developing a decision-making framework, the author attempted to answer the research question. This framework was developed according to Value-based elements which should assist the entrepreneurial entity with decision-making, by indicating whether the proposed project could be profitable in the long run. Specific macroeconomic factors, such as fuel prices and fluctuating exchange rates, could also have an impact on profitability, but these could be a subject for another paper as it involves specific cost analyses.

In order to develop the framework, specific information concerning operational costs, was obtained from the entity. This data was used to develop the framework which required some input variables. The outputs were consistent with the literature study done on VBM, metrics, capital budgeting and valuation.
CHAPTER 3
INTERPRETATIONS OF OUTPUTS

3.1 INTRODUCTION

A decision-making framework was developed according to a value-based management methodology for an entrepreneurial company in the Aviation Industry in South Africa. With reference to the framework, data obtained from the entrepreneurial company was utilized to assist in the calculation of specific operating costs. The categories within the framework consisted of the following: (1) input sheet; (2) costs; (3) revenue; (4) financial statements; (5) capital budgeting; (6) WACC; (7) EVA and (8) dividend growth. The input sheet provided for a more flexible approach as the model could be utilized for any array of appropriate data.

3.2 INPUT SHEET FOR FRAMEWORK

With reference to the above, the input sheet consisted of numerous data inputs, allowing the entrepreneurial entity to “test” different scenarios with regard to outputs. This is briefly discussed next.

3.2.1 GENERAL DATA INPUTS REGARDING OPERATIONS

General inputs regarding operations are listed below:

- number of aircraft in fleet;
- aircraft’s maximum take-offs per day;
- average mission range; and
- exchange rate – USD to ZAR.

With specific data obtained from the aviation entity, the following general specifications regarding operations were developed:

- duration of a typical mission (engine time) of approximately 500 km should take 82 minutes or 1.22 hours to complete; and
- **fuel burn** for a 500 km range trip was assumed to be 375 kg of fuel, resulting in a cost of R6.38 per kilometre of flight per aircraft.

With reference to the typical mission range, according to the inputs, a general indication of the time of a proposed flight was calculated. The fuel costs for the trip could also be calculated according to the distance and exchange rate as inputs.

- **Engine hot section inspection**, as part of maintenance costs, was made accessible as an input with specific reference to the **timespan of flying hours**, as well as the costs involved with specific maintenance (in $). Data indicated that costs could amount to $25 000 for every 1750 flying hours.

- **Engine overhauls**, with reference to costs and timespan, could be entered, but the general information indicated a timespan of every 3500 hours with a cost of approximately $350 000.

- **The average downtime, in days, for a minor service per 100 flying hours**, as well as the costs involved, served as inputs. The same inputs were presented for the **major services per 800 flying hours**.

- **Oil consumption** per aircraft **per kilometre** of flight was another input, resulting in the calculation of fuel and oil costs as operational costs. General indications were that the oil consumption could be calculated as R1 per kilometre of flight per aircraft.

- **Insurance costs** were made accessible as an input, but the general indication was that it could amount to R750 000 on an annual basis.

- **Landing fees per aircraft** per Maximum Take-Off Weight (MTOW) per kg of weight, was estimated at **R0.11 per kilogram**, but could vary yearly, therefore it was presented as input.

- **Parking fees per aircraft** per MTOW per kg of weight was found to be **R0.05 per kilogram**.

- **The annual airworthiness certificate** as issued by the South African Civil Aviation Authority (SACAA), was **R1 500 per aircraft**, but may also increase due to inflation.
In order to compute the *Weighted Average Cost of Capital (WACC)*, the following inputs were necessary:

- the *market rate of return* which was estimated at 12%, according to similar investment portfolios (South African Express: Annual report: 2012:6);

- the *risk-free rate*, projected at 7% after the investigation of the South African 10-year bond rate, which was estimated at 7.95%. A more realistic estimation of 7% was chosen, due to the current economic climate;

- the *Beta-Coefficient* was estimated at 1.1, after research was done on the systematic risk of similar asset portfolios; and

- the *before-tax cost of debt* was assessed at 12%, after the investigation of similar market related investments.

*Direct operating costs* was made available as an input as a percentage of the *total direct operating costs*.

Passenger services, under the heading *Capacity costs*, could be entered as a percentage of operational costs.

*Promotion and sales*, under the heading *Capacity costs*, was available as an input, as a percentage of *operational costs*.

*Cost of sales* was designed to be calculated as a percentage of *revenue*.

Inventories at hand, was a factor of cost of sales.

As illustrated above, all inputs were designed, allowing for observation of the effects on costs as well as revenues for many scenarios.

### 3.2.2 INPUTS REGARDING ASSETS AND CAPITAL STRUCTURE

The following inputs were constructed regarding assets and capital structure, for the aviation entity, in an attempt to assist in making investment decisions.
• Useful lives of the following assets were available for input in accordance to the number of years:
  - airframes and engines;
  - LD2 containers;
  - in-flight equipment;
  - plant and machinery; and
  - motor vehicles.

Regarding assumptions, the following were made concerning capital structure:

• *depreciation* on non-current assets was accounted for on the straight line basis over the assets’ expected useful lives, to their estimated residual value;

• only *ordinary shares* were issued, with no preference stock;

• *ordinary shares* were assumed to be *constant* over a 10 year period; and

• *the dividend growth rate* was assumed to be based on the 2015 *retention rate and Return On Equity (ROE)*, which was only assumed, as the 2015 rates were not available at the time of the study.

### 3.2.3 INPUTS REGARDING REVENUE

Inputs regarding projected revenue are briefly mentioned below in an attempt to illustrate the different variables concerning generating revenue with regard to the Aviation Industry:

• *the load factor* if *passenger configuration* serves as an input, but the general data from the aviation entity appears to be 87% of full seat capacity;

• *The load factor* if *freight configuration* is found to be approximately 70% of full container mass capacity;

• *passenger revenue* is made available as a percentage *mark-up* of *average total costs*; and
• freight revenue is presented as a percentage mark-up of average total costs.

3.3 CATEGORIES EXPLORED ACCORDING TO INPUTS

As indicated at the introduction to Chapter 3, the framework was organized into several categories. Depending on the inputs entered into the input sheet, certain outputs or results were obtained in different classifications. The financial model was constructed according to the formulas discussed in Chapter 2. The model was designed to deliver outputs according to different inputs. The next section indicates certain outcomes as designed according to different inputs. Financial statements are discussed to include costs and revenue.

3.3.1 FINANCIAL STATEMENTS

The financial statements consist of both the projected statement of the comprehensive revenue, as well as the projected statement of the financial position. For purposes of illustration, only the projected statement of revenue is discussed. As the mentioned statement contains information of both revenue and costs, the latter mentioned individual output classifications are not discussed independently.

3.3.1.1 Projected statement of Comprehensive Revenue

The following scenario is explained according to the effect on the revenue when passenger configuration is exercised.

3.3.1.1.1 Revenue: Passenger Configuration

The expected revenue for passenger configuration was based on the input of a 25% mark-up of the average total costs. If the number of aircraft in the fleet and the passenger and freight configurations were applied interchangeably, with the inputs being the calculation of the average total costs; the total annual revenue for passenger configuration amounted to R77 910 550.00. (See Table 7 for inputs and results).
Table 3.1:  Revenue for passenger configuration

<table>
<thead>
<tr>
<th>INPUTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot &amp; co-pilots’ monthly salaries</td>
<td>R40 000</td>
</tr>
<tr>
<td>Flight attendants’ monthly salaries</td>
<td>R20 000</td>
</tr>
<tr>
<td>Mission range in kilometres</td>
<td>500 Km</td>
</tr>
<tr>
<td>Exchange rate USD to ZAR</td>
<td>R10.50</td>
</tr>
<tr>
<td>Maximum Take-Off Weight (MTOW) per aircraft</td>
<td>13 000 Kg</td>
</tr>
<tr>
<td>Cost of aviation fuel in US cents per km</td>
<td>$0.81</td>
</tr>
<tr>
<td>Number of personnel – other than flight crew</td>
<td>100</td>
</tr>
<tr>
<td>Average monthly salary</td>
<td>R5 000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESULTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual revenue: Passenger configuration if fleet of 5 aircraft - year 2015</td>
<td>R77 910 550</td>
</tr>
<tr>
<td>Expected amount per ticket: Passengers if fleet of 5 aircraft</td>
<td>R681.52</td>
</tr>
<tr>
<td>Annual revenue: Passenger configuration if fleet of 10 aircraft - year 2015</td>
<td>R149 155 866</td>
</tr>
<tr>
<td>Expected amount per ticket: Passengers if fleet of 10 aircraft</td>
<td>R652.37</td>
</tr>
</tbody>
</table>

As displayed by the results, the expected ticket per passenger for a fleet of 5 aircraft, should amount to approximately R681.52 each. For a fleet of 10 aircraft, the ticket should be R652.37 in order to achieve a revenue of R149 155 866.

3.3.1.1.2 Revenue: Freight configuration

If all inputs in Table 3.1 were identically entered, with a fleet of 5 aircraft, the total expected revenue for 2015 should be R78 813 628, according to the assumption of the freight revenue being marked-up 20% of the average total costs. The average asking price per container should be R13 709.70. For a fleet of 10 aircraft, the expected revenue for 2015 was estimated at R151 040 532.00, with an average asking price of R13 136.82 per container.
3.3.1.3 Purchasing versus leasing assets: Effects on Net Operating Profit after Tax (NOPAT)

The inputs in Table 3.2 below were regarding the acquisition of assets. The results are indicated in Table 3.3 and graphically displayed in Figure 3.1.

Table 3.2: Inputs regarding the purchasing of assets versus leasing

<table>
<thead>
<tr>
<th>Assets bought: Number of aircraft</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average purchasing price per aircraft</td>
<td>R 12 000 000</td>
</tr>
<tr>
<td>Number of standard LD2 containers bought</td>
<td>15</td>
</tr>
<tr>
<td>Average purchasing price of LD2 containers, per container</td>
<td>R 5 000</td>
</tr>
<tr>
<td>Purchasing price of in-flight equipment</td>
<td>R 1 000 000</td>
</tr>
<tr>
<td>Amount of leased aircraft</td>
<td>10</td>
</tr>
<tr>
<td>Average leasing amount of aircraft per year</td>
<td>R 1 000 000</td>
</tr>
<tr>
<td>Number of LD2 containers leased</td>
<td>15</td>
</tr>
<tr>
<td>Average leasing amount of LD2 containers per year</td>
<td>R 15 000</td>
</tr>
<tr>
<td>Total amount of in-flight depreciable equipment leased yearly</td>
<td>R 50 000</td>
</tr>
<tr>
<td>Amount of purchased non-flight assets (motor vehicle, plant and machinery)</td>
<td>R 5 000 000</td>
</tr>
</tbody>
</table>

Table 3.3: Results of effects on NOPAT - purchasing versus leasing

<table>
<thead>
<tr>
<th>YEAR</th>
<th>NOPAT: FLEET 10 - ASSETS PURCHASED</th>
<th>NOPAT: FLEET 10 - ASSETS LEASED</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>17 342 855</td>
<td>14 387 980</td>
</tr>
<tr>
<td>2016</td>
<td>15 861 562</td>
<td>12 847 589</td>
</tr>
<tr>
<td>2017</td>
<td>26 793 210</td>
<td>23 809 377</td>
</tr>
<tr>
<td>2018</td>
<td>23 987 179</td>
<td>20 883 993</td>
</tr>
<tr>
<td>2019</td>
<td>28 187 800</td>
<td>25 053 482</td>
</tr>
<tr>
<td>2020</td>
<td>26 997 287</td>
<td>23 769 043</td>
</tr>
<tr>
<td>2021</td>
<td>48 521 925</td>
<td>45 455 092</td>
</tr>
<tr>
<td>2022</td>
<td>52 412 079</td>
<td>49 099 900</td>
</tr>
<tr>
<td>2023</td>
<td>31 190 571</td>
<td>27 414 687</td>
</tr>
<tr>
<td>2024</td>
<td>36 674 045</td>
<td>32 822 644</td>
</tr>
</tbody>
</table>
As indicated by the graph in Figure 3.1, NOPAT is slightly elevated when aircraft and containers are purchased, as opposed to being leased. Depreciation, as part of ownership costs, is lower than leasing costs, resulting in a higher NOPAT.

### 3.3.2 CAPITAL BUDGETING

The decision-making process concerning the amount to invest depends on the feasibility of a project. Table 3.4 illustrates the different inputs and possible results of a NPV analysis when the purchasing of assets is considered.
The results indicate that, in the event of purchasing a number of 9 aircraft at a cost of R20 000 000 each, as well as 15 LD2 containers at a cost of R5000 each, and in-flight equipment with a total price of R50 000, the NPV for the project is positive with an amount of R1 961 694. The project should thus be accepted according to NPV-analysis. The IRR for this project was estimated at 10.11%, whilst the MIRR, as a more realistic indicator of
the rate of return was 10%. As per this scenario, the value of the company is R684 676, according to a free cash flow DCF calculation, with a ROIC of 2.4%.

If all inputs are the same except for purchasing a total number of 10 aircraft at a cost of R20 000 000 each, the NPV for the project is negative at –R8 246 477. This indicates that the NPV is smaller than zero and thus indicates that the project should be rejected. The IRR was lower at 9.57%, but the MIRR was equal at 10%.

According to the results from this scenario, the break-even point at which profits should turn into losses is when acquiring a maximum of 9 aircraft, given the specific variable inputs. The maximum rate of return could be estimated at 10%. Dependant variables consisted of a number of aircraft, as well as the purchase price of the aircraft.

Table 3.5 below indicates the varying inputs and results of the NPV analysis, in the event of leasing the required aircraft.
### Table 3.5: NPV–analysis - leasing assets

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>OUTPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets leased: Number of aircraft</td>
<td></td>
</tr>
<tr>
<td>Average leasing amount of aircraft annually</td>
<td>NPV</td>
</tr>
<tr>
<td>Number of standard LD2 containers leased</td>
<td>R 252 660</td>
</tr>
<tr>
<td>Average leasing amount of LD2 containers, per container annually</td>
<td>NPV &gt; 0, THUS ACCEPT PROJECT</td>
</tr>
<tr>
<td>Total amount of in-flight depreciable equipment leased yearly</td>
<td>IRR</td>
</tr>
<tr>
<td></td>
<td>10.82%</td>
</tr>
<tr>
<td></td>
<td>MIRR</td>
</tr>
<tr>
<td></td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>DCF - VALUATION</td>
</tr>
<tr>
<td></td>
<td>R 28 998</td>
</tr>
<tr>
<td></td>
<td>ROIC</td>
</tr>
<tr>
<td></td>
<td>18.51%</td>
</tr>
<tr>
<td>Assets leased: Number of aircraft</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NPV</td>
</tr>
<tr>
<td></td>
<td>R 818 922</td>
</tr>
<tr>
<td></td>
<td>NPV &lt; 0, THUS REJECT PROJECT</td>
</tr>
<tr>
<td></td>
<td>IRR</td>
</tr>
<tr>
<td></td>
<td>7.4%</td>
</tr>
<tr>
<td></td>
<td>MIRR</td>
</tr>
<tr>
<td></td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>DCF - VALUATION</td>
</tr>
<tr>
<td></td>
<td>-R 796 663</td>
</tr>
<tr>
<td></td>
<td>ROIC</td>
</tr>
<tr>
<td></td>
<td>20.69%</td>
</tr>
</tbody>
</table>

The results indicate that it is possible to lease four aircraft at a leasing amount of R1 000 000 annually, 15 containers at an average amount of R5000 annually, leasing in-flight depreciable equipment of R50 000 and have a projected positive NPV of R252 660. By leasing one more aircraft, and all else staying identical, the NPV is negative at -R796 663. MIRR as well as IRR decline from 11% and 10.82%, to 10% and 7.4% respectively, due to the negative NPV of -R818 922.
Results indicate that, if leasing occurs, a maximum number of 4 aircraft should be feasible, given the variable inputs as indicated in Table 3.5. Comparing Tables 3.4 and 3.5, the valuation is much higher when assets are purchased, due to the added value of these assets to the company. Another variable influencing the valuation is the amount of debt the company has, as well as the interest rate payable. These results are obtained from an input of R10 000 000 debt at a 20% interest rate, which is relatively high. If the inputs in Table c3.4 stay the same, except for the interest rate to decline to 15%, the value is higher at R830 007.

### 3.3.3 WEIGHTED AVERAGE COST OF CAPITAL (WACC)

As the WACC is based on the relationship of the cost of debt and equity, the dependent variables are the amount of debt, interest rate of debt, share capital and overall capital structure of the company. Table 3.6 below illustrates these different variable inputs, with possible results.

**Table 3.6: WACC**

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>OUTPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term borrowings</td>
<td>R 50 000 000</td>
</tr>
<tr>
<td>Interest rate of long-term borrowings</td>
<td>12%</td>
</tr>
<tr>
<td>Ordinary share capital</td>
<td>R 50 000 000</td>
</tr>
<tr>
<td><strong>OUTPUTS</strong></td>
<td></td>
</tr>
<tr>
<td>Equity to debt %</td>
<td>50%:50%</td>
</tr>
<tr>
<td>WACC</td>
<td>9.75%</td>
</tr>
<tr>
<td><strong>INPUTS</strong></td>
<td></td>
</tr>
<tr>
<td>Long-term borrowings</td>
<td>R 0</td>
</tr>
<tr>
<td>Ordinary share capital</td>
<td>R 100 000 000</td>
</tr>
<tr>
<td><strong>OUTPUTS</strong></td>
<td></td>
</tr>
<tr>
<td>Equity to debt %</td>
<td>100%:0%</td>
</tr>
<tr>
<td>WACC</td>
<td>12.5%</td>
</tr>
<tr>
<td><strong>INPUTS</strong></td>
<td></td>
</tr>
<tr>
<td>Long-term borrowings</td>
<td>R 100 000 000</td>
</tr>
<tr>
<td>Ordinary share capital</td>
<td>R 0</td>
</tr>
<tr>
<td><strong>OUTPUTS</strong></td>
<td></td>
</tr>
<tr>
<td>Equity to debt %</td>
<td>0%:100%</td>
</tr>
<tr>
<td>WACC</td>
<td>7%</td>
</tr>
</tbody>
</table>
According to the results, the WACC for a company with a capital structure of 50% debt and 50% equity is calculated at 9.75%. An unlevered company without debt can obtain a WACC of 12.5%. A levered company with no equity or capital can probably obtain a WACC of only 7%. Calculating the WACC, the sum of the weight of the capital is multiplied by the cost of equity and the weight of debt, and multiplied by the cost of debt. Depending on the capital structure of the company, any investment made should not be at a rate less than the mentioned WACC.

3.3.4 ECONOMIC VALUE ADDED (EVA) AND SHAREHOLDER VALUE ADDED (SVA)

Dependant variables which could be influential to this metric are fluctuations in sales, as well as operating expenses. Although a constant decrease in operating costs is not a realistic scenario, it is utilized in order to effectively indicate the effect on EVA and SVA, due to the scenario of constantly increased sales. Another important factor is the tax rate. Table 3.7 below illustrates different inputs, with the resulting outputs for the period of 2015 to 2024 indicated in Table 3.8.

Table 3.7: EVA and SVA inputs - Scenario 1

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>INPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant increase in sales for 2015-2024</td>
<td>1%</td>
</tr>
<tr>
<td>Constant decrease in operating expenses for 2015-2024</td>
<td>-1%</td>
</tr>
<tr>
<td>Tax rate</td>
<td>30%</td>
</tr>
</tbody>
</table>
Table 3.8: EVA and SVA outputs - Scenario 1

<table>
<thead>
<tr>
<th>YEAR</th>
<th>EVA</th>
<th>SVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>-348 786</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>3 019 859</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>6 389 572</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>9 760 637</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>13 133 342</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>16 507 973</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>19 884 818</td>
<td></td>
</tr>
<tr>
<td>2022</td>
<td>25 821 381</td>
<td></td>
</tr>
<tr>
<td>2023</td>
<td>26 646 298</td>
<td></td>
</tr>
<tr>
<td>2024</td>
<td>29 951 290</td>
<td>R 74 097 203</td>
</tr>
</tbody>
</table>

Results indicate that with a constant 1% growth in sales over a ten-year period and a constant 1% decline in operating expenses, EVA is positive, except for 2015, which is expected as this is the start of the operations. SVA amounts to a projected R74 097 203. Figure 3.2 below indicates the EVA plotted as a percentage of operating profits.
Figure 3.2: EVA as a % of operating profits - Scenario 1

Table 3.9 below indicates a different scenario, where no increases in sales are expected, operating expenses increase with 1% annually with the same tax rate of 30%. Table 3.10 shows the results.

**Table 3.9: EVA and SVA inputs - Scenario 2**

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>INPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant increase in sales for 2015-2024</td>
<td>0%</td>
</tr>
<tr>
<td>Constant increase in operating expenses for 2015-2024</td>
<td>1%</td>
</tr>
<tr>
<td>Tax rate</td>
<td>30%</td>
</tr>
</tbody>
</table>
Table 3.10: EVA and SVA results - Scenario 2

<table>
<thead>
<tr>
<th>YEAR</th>
<th>EVA</th>
<th>SVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>-348 786</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>-1 226 420</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>-2 117 853</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>-3 023 222</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>-3 942 667</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>-4 876 329</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>-5 824 351</td>
<td></td>
</tr>
<tr>
<td>2022</td>
<td>-8 266 300</td>
<td></td>
</tr>
<tr>
<td>2023</td>
<td>-7 764 047</td>
<td></td>
</tr>
<tr>
<td>2024</td>
<td>-8 756 013</td>
<td>-R 23 060 635</td>
</tr>
</tbody>
</table>

The results indicate a negative EVA as well as SVA. Sales growth should thus be observed as a key indicator in the procurement of shareholder wealth. Expenses should be limited, especially fuel costs, as this is the major culprit in escalating operating costs when calculated at unit costs per kilometre of flight.

3.3.5 DIVIDEND GROWTH ACCORDING TO GORDON GROWTH MODEL

Dependant variables for inputs with regard to the Gordon Growth Model of constant dividend growth, consists of WACC, retention rate and ROE. Growth rate is based on 2015’s expected figures, as indicated in Table 3.11 below. Table 3.12 indicates the results according to the dividend growth model.

Table 3.11: Dividend growth; inputs - Scenario 1

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>INPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WACC</td>
<td>10.45%</td>
</tr>
<tr>
<td>Retention rate</td>
<td>100%</td>
</tr>
<tr>
<td>ROE</td>
<td>50%</td>
</tr>
</tbody>
</table>
### Table 3.12: Dividend growth; results - Scenario 1

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CONSTANT GROWTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>R -2.52</td>
</tr>
<tr>
<td>2016</td>
<td>R 6.41</td>
</tr>
<tr>
<td>2017</td>
<td>R -16.29</td>
</tr>
<tr>
<td>2018</td>
<td>R 41.41</td>
</tr>
<tr>
<td>2019</td>
<td>R -105.27</td>
</tr>
<tr>
<td>2020</td>
<td>R 267.60</td>
</tr>
<tr>
<td>2021</td>
<td>R -680.26</td>
</tr>
<tr>
<td>2022</td>
<td>R 1 729.31</td>
</tr>
<tr>
<td>2023</td>
<td>R -4 396.13</td>
</tr>
<tr>
<td>2024</td>
<td>R 11 175.49</td>
</tr>
</tbody>
</table>

Value of price per share data

R 8 020

Tables 3.13 and 3.14 indicate the second scenario for dividend growth where 20% of the dividends are paid, indicative of an 80% retention rate.

### Table 3.13: Dividend growth; inputs - Scenario 2

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>INPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WACC</td>
<td>10.45%</td>
</tr>
<tr>
<td>Retention rate</td>
<td>80%</td>
</tr>
<tr>
<td>ROE</td>
<td>44%</td>
</tr>
</tbody>
</table>
Table 3.14: Dividend growth; results - Scenario 2

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CONSTANT GROWTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>R -3.98</td>
</tr>
<tr>
<td>2016</td>
<td>R 16.00</td>
</tr>
<tr>
<td>2017</td>
<td>R -64.26</td>
</tr>
<tr>
<td>2018</td>
<td>R 258.13</td>
</tr>
<tr>
<td>2019</td>
<td>R -1 036.85</td>
</tr>
<tr>
<td>2020</td>
<td>R 4 164.84</td>
</tr>
<tr>
<td>2021</td>
<td>R -16 729.43</td>
</tr>
<tr>
<td>2022</td>
<td>R 67 199.13</td>
</tr>
<tr>
<td>2023</td>
<td>R -269 926.90</td>
</tr>
<tr>
<td>2024</td>
<td>R 1 084 248.08</td>
</tr>
<tr>
<td>Value of price per share data</td>
<td>R 868 125</td>
</tr>
</tbody>
</table>

A comparison of the two scenarios indicates a direct interaction between the retention rate, the ROE and the price per share data. As growth is the product of the retention rate and the ROE, the higher the retention rate, the higher the ROE, but the lower the price per share data. This occurs because the dividends are held back, and not distributed to the shareholders.

3.4 SUMMARY TO CHAPTER 3

Available inputs were described in an attempt to illustrate the different scenarios which could be tested by utilization of the model. Different categories of available output sheets, consisting of financial statements, capital budgeting, WACC, EVA and dividend growth, according to the constant growth model, were used as the outlay of Chapter 3. This was done in order to sketch different scenarios and illustrate the various outputs. Dependant variables were recognised for each category. Chapter 4 is an overview of the paper.
CHAPTER 4
RESULTS AND RECOMMENDATIONS

4.1 INTRODUCTION

Chapter 4 consists of research findings in view of the literature study done. By revisiting the main objective of the study, a decision framework was developed for the purpose of assisting with investment decision-making for an aviation entity. This framework was constructed in context of the value-based management and capital budgeting techniques. Possible outcomes could include effects on profitability, and either long-term success or failure if the entrepreneurial entity decides to invest.

The first sub-objective was a literature study on the value-based management theory, capital budgeting techniques and the general financial information with regard to the Aviation Industry in South Africa. The second sub-objective was an empirical study. With the usage of Excel programming and specific data from the aviation entity, a financial decision framework was created for decision-making purposes.

4.2 RESULTS AND RECOMMENDATIONS OF THE MAIN OBJECTIVE

The main objective of this dissertation was achieved, as a framework was constructed which should support the participating aviation entity in decision-making. The framework consisted of different sections or categories; including assumptions, inputs, costs, revenue, financial statements, capital budgeting, WACC, EVA and a dividend growth model.

Different inputs were entered into the framework, which resulted in the different outputs that are addressed next.

4.2.1 RESULTS AND RECOMMENDATIONS: REVENUE AND TICKET PRICES

With reference to the revenue and the prospective issuing of ticket prices, the following results are revisited.
4.2.1.1 Results: Revenue and ticket prices

Certain inputs were made which led to the following results, according to a scenario of passenger configuration (See Table 3.1 for inputs). Results indicated that a passenger ticket should not be sold for less than R681.52 when owning a fleet of 5 aircraft, and at no less than R652.37 per ticket when owning a fleet of 10 aircraft. A revenue of R77 910 550 could then be achieved for a fleet of 5 aircraft and R149 155 866 for a fleet of 10 aircraft.

Configuring to freight transportation, whilst all other inputs remain the same, the price per container for a fleet of 5 aircraft should not be less than R13 709.70 per container, while for a fleet of 10 aircraft, no less than R13 136.82 each. Approximate revenues indicated by these scenarios were R78 813 628 and R151 040 532, according to the fleet size.

4.2.1.2 Recommendations: Revenue and ticket prices

The recommendations are as follow:

- For a distance of approximately 500 km and with 5-10 aircraft, the price per ticket should range between R600 and R750 each, in order to achieve an average potential income of R109 500 000, if only passengers were transported.

- For a distance of approximately 500 km and with 5–10 aircraft, the price per container should range between R13 000 and R14 000 per container, in order to achieve an average potential income of R114 930 000 if only freight was transported.

- Ticket and container prices are directly interrelated with the number of aircraft in the fleet. According to this scenario, passenger transportation generates a higher income than freight hauling.

4.2.2 RESULTS AND RECOMMENDATIONS REGARDING PURCHASING VERSUS LEASING OF AIRCRAFT

Results regarding the purchasing of aircraft versus the leasing thereof, are discussed below.
4.2.2.1 Results regarding purchasing versus leasing of aircraft

NOPAT is slightly higher when aircraft are purchased, compared to being leased. The reason being that leasing costs are higher than depreciation costs; the latter being an ownership cost.

4.2.2.2 Recommendations regarding purchasing versus leasing of aircraft

The recommendations for the aviation entity regarding whether to purchase aircraft as opposed to leasing, considering the specific input variables, are as follows:

- If financing is available, purchasing aircraft seem to be more profitable than leasing. If the aircraft is owned, positive contributions could be made to the statement of the financial position. Any company with a strong asset-base, seem to be more attractive to potential investors.

- Leasing costs are deductible from taxes, and could therefore mean a decrease in taxes for the company when leasing aircraft. Interest and wear and tear are also tax deductible though, thus creating an opportunity for a new study to compare the differences.

4.2.3 RESULTS AND RECOMMENDATIONS ON CAPITAL BUDGETING: NPV ANALYSIS PURCHASING AIRCRAFT

By using a NPV analysis, the results should indicate to the aviation entity whether to invest or not in the proposed project.

4.2.3.1 Results on capital budgeting: NPV analysis: purchasing aircraft

According to the different inputs as indicated in Table 3.4, the following results have been calculated for a fleet of 9 aircraft if bought at a price of R20 000 000 per aircraft, 15 LD2 containers at a purchase price of R5 000 each, and in-flight equipment with a total purchasing price of R50 000:

- NPV was positive at R1 961 694 (>0); thus accept the project;
• IRR was 10.11% and MIRR was 10%; depending on hurdle rate - either accept or reject the project if the MIRR is higher than the hurdle rate; and

• the DCF valuation of the company was R684 676.00 according to inputs.

According to the same inputs, but purchasing a fleet of 10 aircraft at a price of R20 000 000 per aircraft, the following results were revealed:

• NPV was negative at –R8 246 477 (<0); thus reject the project;

• IRR was 9.57% and MIRR was 10%; depending on the hurdle rate, either accept or reject the project if the MIRR is higher than hurdle rate; and

• the DCF valuation of the company was -R2 897 146, according to inputs.

4.2.3.2 Recommendations on capital budgeting: NPV analysis: Purchasing aircraft

The following recommendations were made regarding the NPV analysis:

• In the event of purchasing aircraft, a total of 10 aircraft could indicate a negative NPV, which should result in rejecting the project on basis of the negative NPV rule.

• Depending on the hurdle rate, decisions could be made regarding IRR and MIRR; if MIRR is higher than hurdle rate, accept the project. MIRR is a better indicator of the rate of return than IRR, because of modification.

• The scenario of 9 aircraft purchased should be considered, given that a positive DCF valuation is obtained.

4.2.4 RESULTS AND RECOMMENDATIONS ON CAPITAL BUDGETING: NPV ANALYSIS LEASING AIRCRAFT

Results concerning the leasing of aircraft according to the NPV analysis are discussed next.
4.2.4.1 Results on capital budgeting: NPV analysis: leasing aircraft

Given the different inputs in Table 3.5, the following results are indicated for a fleet of 4 leased aircraft at a leasing amount of R1 000 000 annually:

- NPV was positive at R252 660 (<0); thus acceptance of the project is advised, according to the NPV decision rule;
- IRR was 10.82% and MIRR 11%; which indicates that, depending on the hurdle rate, the project should either be accepted or rejected; and
- the DCF valuation of the company is R505 314.

According to the identical inputs, the only difference being 5 aircraft leased, the following results were obtained:

- NPV was negative with an amount of R818 922 (<0); reject the project;
- IRR was 7.4% and MIRR 10%, which indicates that, depending on the hurdle rate, the project should either be accepted or rejected.
- the DCF valuation was negative at R796 663 and should thus be rejected.

4.2.4.2 Recommendations on capital budgeting: NPV analysis: Leasing aircraft

The following recommendations are made regarding capital budgeting in the event of leasing aircraft:

- If all inputs replicate real world scenarios, a maximum of 4 aircraft should be leased for this to be a successful project. Changing the inputs could result in different recommendations.

4.2.5 RESULTS AND RECOMMENDATIONS ON WEIGHTED AVERAGE COST OF CAPITAL (WACC)

As the WACC is indicative of the minimum rate for investment purposes, it is necessary to enable the entrepreneurial entity to establish this rate.
4.2.5.1 Results on Weighted Average Cost of Capital (WACC)

WACC is based on the relationship of the cost of debt and equity; therefore the dependent variables should be the amount of debt, the interest rate of the debt, share capital and overall capital structure of the company. Table 4.1 below illustrates these different variable inputs, with possible results.

Table 4.1: WACC

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>OUTPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term borrowings</td>
<td>Equity to debt %</td>
</tr>
<tr>
<td>R 50 000 000</td>
<td>50%:50%</td>
</tr>
<tr>
<td>Interest rate of long-term borrowings</td>
<td>WACC</td>
</tr>
<tr>
<td>12%</td>
<td>9.75%</td>
</tr>
<tr>
<td>Ordinary share capital</td>
<td></td>
</tr>
<tr>
<td>R 50 000 000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>OUTPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term borrowings</td>
<td>Equity to debt %</td>
</tr>
<tr>
<td>R 0</td>
<td>100%:0%</td>
</tr>
<tr>
<td>Ordinary share capital</td>
<td>WACC</td>
</tr>
<tr>
<td>R 100 000 000</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

The results indicate that for a company with a capital structure of 50% debt and 50% equity, the WACC is calculated at 9.75%. An unlevered company without debt can obtain a WACC of 12.5%. A levered company with no equity or capital can probably obtain a WACC of 7%. Depending on the capital structure of the company, any investment made should not be at a rate less than the mentioned WACC.
4.2.5.2 Recommendations on Weighted Average Cost of Capital (WACC)

Recommendations are as follows:

- Depending on the capital structure, the higher the equity, the higher the WACC; and
- The expected rate of return should not be less than the WACC as a variant of the capital structure and the interest rate of debt if it is a levered company.

4.2.6 RESULTS AND RECOMMENDATIONS ON ECONOMIC VALUE ADDED (EVA) AND SHAREHOLDER VALUE ADDED (SVA)

Using EVA as a metric should illustrate the economic value added to the company on a long-term basis, discounted to the present by using WACC as a discount rate.

4.2.6.1 Results on Economic Value Added (EVA) and Shareholder Value Added (SVA)

According to Table 3.7, the inputs in the calculation of EVA, indicates a constant increase of 1% in sales, whilst a constant decrease of 1% in operating expenses was entered. The results in Table 3.8 point towards a positive EVA, as well as a SVA of R74 097 203. The second scenario indicates no increase in sales over a 10 year period, with a constant 1% increase in operating expenses. Results indicate a negative EVA as well as a negative SVA of -R23 060 635.

4.2.6.2 Recommendations on Economic Value Added (EVA) and Shareholder Value Added (SVA)

Recommendations regarding EVA and SVA:

- sales growth is one of the most important indicators of shareholder wealth creation; and
- while sales should increase, the other important factor is the containment of operating expenses.
4.2.7 RESULTS AND RECOMMENDATIONS ON DIVIDEND GROWTH

Prospective dividend growth could be of essential interest to investors, thus important to this study.

4.2.7.1 Results on dividend growth

Table 3.11 indicates the dependant variable inputs of WACC, the retention rate and ROE to be 10.45%, 100% and 50% respectively. According to these inputs, the value per price of share amounts to R8 020. By adjusting the variables to 10.45%, 80% and 44% respectively in Table 3.12, the value per share price increases to R868 125. This is a considerable increase as a result of the lower retention rate and ROE.

4.2.7.2 Recommendations on dividend growth

- The retention rate and ROE are inversely linked to the share price, as the higher the retention rate and ROE, the lower the price per share.
- Retention of dividends could have a negative effect on the price per share.

4.3 RECOMMENDATIONS OF SUB OBJECTIVES

The following recommendations are made in accordance to sub objectives, as indicated at the beginning of this chapter.

4.3.1 RECOMMENDATIONS REGARDING SUB OBJECTIVES

The first sub objective was to conduct a literature study on the value-based management theory, capital budgeting techniques, dividend growth models and the AI in South Africa in general.

4.3.1.1 Recommendations on VBM theory

The following recommendations could be made if the aviation entity strives to adopt value-based management as management model:

- the core objective of company should be the creation of sustainable value;
- objectives should be aligned from top managers down to employees;
- a corporate culture of value-creation should be engraved into the company; and
- all decisions made should be based only on the creation of value, especially for shareholders.

A framework created by Ittner and Larcker (2001:353) consists of the following 6 generic steps which need to be followed for the successful implementation of the VBM model:

- **Step 1**: Setting specific organisational goals with the overall objective of creating shareholder value;
- **Step 2**: Developing policies and the selection of organisational goals;
- **Step 3**: Development of value drivers;
- **Step 4**: Developing action plans, selection of measures and setting targets;
- **Step 5**: Evaluating performance; and
- **Step 6**: In the case of underperformance, revisit steps 1 to 5.

Development of financial as well as non-financial value drivers should be of importance in order to develop pertinent action plans. Evaluation of performance should be on an ongoing basis in order to be pro-active in identifying problems.

Consultancy firms have developed metrics which are available for use by VBM-firms. These include:

- Discounted Cash Flows (DCF);
- Cash Flow Return on Investment (CFROI);
- Return on Invested Capital (ROIC); and
- Economic Value Added (EVA).
The most important metrics are the DCF for the valuation of the company and the EVA for the calculation of the value added to the company from an economic, and not an accounting point of view. The calculation of the Weighted Average Cost of Capital (WACC) is examined and utilized within the decision framework.

**4.3.1.2 Recommendations on dividend growth**

Dividend growth models were studied, with the constant growth model, also known as Gordon Growth Model, as the main choice. This model assumes that the company’s dividends will grow at a constant rate for a certain period in the future. This model was chosen due to the Aviation Industry in South Africa’s expectations of a 14% constant growth within the next three years.

**4.3.1.3 Recommendations on capital budgeting**

Capital budgeting techniques are examined with Net Present Value (NPV) and Modified Internal Rate of Return (MIRR) being the most prominent. Internal Rate of Return (IRR) is also mentioned, but the problem of errors due to multiple IRR’s as well as unusual cash flows, proved that MIRR is the more appropriate rate of return. The author attempted to answer questions regarding the acceptance or rejection of the project, according to the results of the NPV and MIRR. The golden rule regarding the NPV is to accept the project if the NPV is greater than zero. A rate of return chosen by the company, or hurdle rate, should be compared to the MIRR in order to supply a definite answer; whether to accept or reject the project.

If MIRR > Hurdle rate; accept the project.

**4.3.1.4 Recommendations on AI in South Africa and its value drivers**

Lastly the Aviation Industry in South Africa is explored with certain statistics revealed. Most important is the projected 14% expected growth within the next three years.

A recommended illustration of the value drivers for the Aviation Industry in South Africa is illustrated in Figure 3.7, with the following key drivers:
• Financial drivers: Passenger growth, passenger load factor, freight growth, average route frequency, transition period and turnaround time; and

• Non-financial drivers: Ownership, safety, competent personnel, efficient infrastructure and the number of aircraft in the fleet.

4.4 SUMMARY TO CHAPTER 4

In summary to this chapter, recommendations were made with regard to the main as well as the sub objectives to this study. VBM as a management model should enable a company to have a futuristic outlook and all decisions should be based on the term “value-creation”. Even though the wealth creation of shareholders should be the core objective of any company, other stakeholders must also be considered in any attempt to improve overall value.

Managers’ objectives have to be aligned with those of the shareholders in order to obtain a universal amalgamation of value-creation.
REFERENCES


