The ABCs of Financial Performance Measures and Benchmarks for Canada's Tourism Sector

Decision-making Tools for Canada's Tourism Operators

Guide 4

Discover our true nature

Canadian Tourism Commission
Commission canadienne du tourisme

Canada

The ABCs of Financial Performance Measures and Benchmarks for Canada's Tourism Sector

Decision-making Tools for Canada'sTourism Operators Guide 4

Prepared by
Professor Pierre G. Bergeron

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Scott Meis
Executive Director, Research

Preface

The tourism sector has recently experienced a slower growth in sales activities due to the slowdown in economic activities, the September 11, 2001 tragedy, the Iraqi War and most recently the outbreak of Severe Acute Respiratory Syndrome (SARS). Whether this slower growth pace will continue over the next years is still a question mark. However, one thing is certain; to stay competitive and increase profitability, tourism operators will have to be more vigilant in managing their business establishments.

We are pleased to make available *The ABCs of Financial Performance Measures and Benchmarks for Canada's Tourism Sector* Guides. There are six guides in the series:

- Guide 1 – Financial Planning: Key to Maximizing Your Bottom Line
- Guide 2 – Profiling Your Financial Statements
- Guide 3 – Financial Performance Measures and Benchmarks for Canada's Tourism Operators
- Guide 4 – Decision-making Tools for Canada's Tourism Operators
- Guide 5 – Linking Your Financial Performance Measures to Your Business Plan
- Guide 6 – Industry Financial Averages and Benchmarks for Canada's Tourism Operators.

These six financial planning guides were written for tourism operators who have little or no experience in the area of finance. These guides can be used as reference documents by tourism operators who wish to better understand the language of accounting and finance, maximize the utilization of the financial planning spreadsheet, and discuss with more self-assurance their financial plans with investors. These guides become progressively more sophisticated, ranging from the principles of finance and culminating with cutting edge performance measures and financial analysis and decision-making techniques.

In addition, to help tourism operators in improving the analysis of their business establishment and the effectiveness of their decisions, we will also be introducing a new tool; a customized tourism operators' financial planning spreadsheet in the near future. This practical and user-friendly tool can help tourism operators analyze quickly the impact of their decisions on the financial destiny of their business establishments. After taking just a few moments to input their financial statement data on the spreadsheet, tourism operators will be able to view the financial profile of their businesses from different angles: liquidity, profitability, productivity, overall financial health, growth rate, financial stability and shareholder value. The financial planning spreadsheet will not only calculate the more critical financial performance measures of their business, but will also compare them to industry averages and financial benchmarks. This way, tourism operators will be able to determine how well they are doing and what needs to be done to improve their performance in order to remain profitable and competitive. This spreadsheet also offers tourism operators several decision tools that will help better assess the viability of their investment decisions.

The CTC has made every effort to ensure the accuracy of the information contained in these guides. The CTC does not accept any legal responsibility for consequences that may arise from errors, omissions or any opinions given. These guides are not a substitute for specific professional advice on business or other matters.

These six guides and the financial planning spreadsheets will be made available on the CTC's website: www.canadatourism.com

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Introduction

The preceding three guides in this series focused on analyzing financial statements. Guide 1, *Financial Planning: Key to Maximizing Your Bottom Line*, covered the importance of financial planning and the objectives of financial management. Guide 2, *Profiling Your Financial Statements*, explained the structure and contents of the four financial statements: the income statement, the statement of retained earnings, the balance sheet and the statement of cash flows. Guide 3, *Financial Performance Measures for Canada's Tourism Operators*, described important financial performance measures that operators of tourist business establishments can use to analyze their financial performance in terms of liquidity, debt-coverage, asset management, profitability and overall financial health.

This Guide looks at business-decisions tools, and how operators can use them to confirm their "feelings" about the outcome of a particular course of action. When operators prepare their business plans, or examine different operating or investment options, it is important that they use financial tools to help them make decisions. These decisions may have to do with increasing the selling price of a product or service, hiring a new employee, spending more money on advertising, automating a service operation, buying new equipment, or introducing a new product line or service.

The three tools explained in this Guide are: break-even analysis, monthly cash budget, and capital project analysis. Essentially, *break-even analysis* examines the level of sales revenue a business establishment should achieve before it ceases to incur losses and begins to make a profit. The *monthly cash budget* looks at how much money a business establishment should have on hand in order to meet its monthly cash commitments, which include paying suppliers and employers or servicing a line of credit. *Capital project analysis* looks at whether or not an investment in a capital project can be justified in terms the cash it will generate over an extended number of years.

Break-Even Analysis

If operating costs changed in the same proportion as revenue, or if profits had a linear relationship with costs or revenue, break-even analysis would be irrelevant as a decision-making tool. However, costs do behave in a variety of ways with respect to sales revenue. If budgets and profit plans are to be prepared meaningfully and business decisions made rationally, it is important for operators to be familiar with how costs change within specific time periods, at different levels of operations, and even in response to changes in methods of providing services.

The factors that affect profit levels are:

- volume of production or level of service;
- prices;
- costs (fixed and variable); and
- changes in product or service mix.

Break-even analysis is a straightforward yet powerful financial tool that can help managers make a wide-range of important decisions that touch on all types of business activities, including those that follow.

Pricing: break-even analysis helps evaluate the effect of changing prices and volume relationships on levels of profit. For example, if a hotel decides to increase its price by 5% with no change to its variable and fixed costs, break-even analysis would make it easy to determine whether the change will have a positive or negative impact on profitability.

New ventures: decisions about introducing new products or services, hiring new sales representatives, opening a new sales office or launching a new advertising campaign are typically of the kind that break-even analysis can help. For example, break-even analysis can help determine the incremental sales revenue level that is required to justify a major expenditure, given projected sales revenue and operating costs.

Modernization and automation: decisions about these activities can be made more clearly with break-even analysis because it discloses profit implications. All that is required within the break-even analysis framework is to determine the extent to which variable costs (e.g., raw materials, direct labour, etc.) can be substituted by fixed costs (e.g., interest charges or depreciation of capital assets). For example, if an operator wants to invest $400,000 in automating a service operation, additional costs associated with the automation program (most of them fixed, presumably) would replace the use of workers and the reduction of wages (variable costs). Break-even analysis helps study the interplay between the various types of costs affecting a business establishment and the impact those costs have on profit performance.

Expansion: decisions to do with expansion require careful study of the impact that incremental sales revenue has on profitability. When one unit of a business reaches full operating capacity, operators must decide whether to use their resources to expand the existing establishment or to build a new one. The key question is this: Will the

incremental sales revenue and cost levels have a positive or negative effect on profitability? Expansion programs affect variable costs, fixed costs, economies of scale and profitability; break-even analysis helps analyze the interplay between each of these variables.

Profit: what does a particular company need to do to achieve a certain level of profitability? For example, if a company is operating at a loss position or below profit performance and wants to achieve a profit objective of, say, a 10% return on investment, break-even analysis will help answer the following questions:

- How many more customers do we need?
- At what price should we sell our product or service?
- What should our fixed costs be?
- What should each service cost be?
- Which product or service should be pushed?

The third column in Appendix 4.1 (objective) of this Guide shows how to use the break-even point tool to make decisions. The numbers appearing there were obtained from the income statement in Appendix 2.1. To prepare profit and operating budgets when using break-even analysis, operators must first classify all costs shown on the income statement into two distinct groups: fixed costs and variable costs. The following explains the difference between fixed and variables costs and how they can be rearranged in a format that helps a business find its break-even point.

Net Sales Revenue

As shown in Appendix 4.1, the operator of the business establishment is forecasting $27,965,000 in sales revenue. If the business were a hotel establishment, this would represent sales revenue to be generated by different operating units (e.g., rooms, restaurants, parking, conventions, etc.). Although we will calculate the break-even point for the entire business establishment, this tool could also be used to make decisions for individual operating units.

Variable Costs

The second heading in Appendix 4.1 is variable costs. As indicated, the total variable costs amount to $12,724,000. These vary directly with fluctuations in production or service levels. They are also known as direct costs, out-of-pocket costs, and volume costs. As the volume of a business increases, so do these costs.

For example, if a business were to produce 100 widgets made of material A at a per-unit cost of $0.10 and of material B at $0.20, the firm would incur a total variable cost of $30. If the business were to sell 1,000 units, the costs would increase to $300. Similarly, if a hotel rented 60 rooms instead of 50, its cleaning costs would also be higher. These costs are considered variable because they change almost automatically with volume or level of service. The following are typical examples of variable costs:

• Sales commission	• Direct labour	• Packing materials
• Electricity	• Overtime premiums	• Equipment rentals
• Materials	• Freight	• Fuel

Contribution Margin

The difference between net sales revenue and total variable costs is called contribution margin (also known as marginal contribution, profit pick-up, cash margin, or margin income). As the word suggests, this amount contributes to paying fixed costs (at first). After all fixed costs are paid it contributes towards earning an incremental profit. In Appendix 4.1, the contribution margin totals $15,241,000 for TravelWorld Inc.

Simply put, when variable costs are deducted from revenues, we are left with an amount that, when cumulated, will be used to pay off fixed costs and realize a desired profit level. For example, assume that John's monthly fixed expenses for his house are $2,500 (e.g., mortgage, hydro, insurance, etc.). Let's also assume that, in his job, John works on a commission basis and earns $25 an hour on average. It takes 100 hours for John to earn enough to cover all his fixed expenses ($2,500 ÷ 25 hours). If John works 101 hours, the money that he earns in the last hour contributes to a surplus (profit). If John works 40 hours a week (or 160 hours a month), he will generate a $1,500 surplus (160 hours x $25 = $4,000 - $2,500).

Rearranging the information on an income statement (like the one in Appendix 2.1) can help determine the contribution margin. Appendix 4.1 shows how contribution margin relates to revenue and variable costs.

Net sales revenue	$27,965,000
Total variable costs	12,724,000
Contribution margin	$15,241,000

The contribution margin can also be expressed on a per-unit basis as the difference between unit selling price and unit variable cost. This information becomes extremely valuable for decision-making purposes. If the contribution margin is positive, operators know how much money is earned on each unit sold. This contributes to meeting fixed costs and eventually realizing a profit.

The contribution can also be expressed by a ratio called the profit/volume (PV) ratio. It can also be referred to as: the marginal contribution ratio, marginal contributional ratio, contribution ratio, or marginal income ratio.

Using the numbers in Appendix 4.1, we calculate TravelWorld Inc.'s PV ratio to be 0.545 ($15,241,000 ÷ $27,965,000). This means that for every dollar of net sales revenue (volume), the business establishment earns $0.545 in contribution or (profit).

Fixed Costs

The other element required to calculate the break-even point is fixed costs. These are costs that remain constant at varying levels of production. They are also known as period costs, time costs, constant costs, or standby costs. Although there are subtle variations between each of these terms, they all have an element of "fixedness" and must be paid over the passage of time; some are inescapable because they are essential for operating purposes. Fixed costs do not change as a result of variations in levels of production or service. The following are typical examples:

- Rent
- Interest on mortgage
- Property insurance
- Property taxes
- Office salaries
- Depreciation
- Protection services
- Telephone
- Professional fees

As shown in Appendix 4.1, the total fixed costs for TravelWorld Inc. amount to $10,379,000.

Semi-Variable Costs

While some costs vary directly and proportionately with volume, others have characteristics of both fixed and variable costs; in other words, they possess different degrees of variability, or they change in a disproportionate way with changes in output levels. For this reason, these types of costs are considered semi-variable (or semi-fixed).

Electricity in a house is a typical example. House owners must pay a basic fixed cost each month (say $50.00) even if they don't use any electricity; in fact, the owner could be away on holidays for several months and still receive a $50.00 bill from the hydro company. However, the owners have to pay additional costs for their use of electrical equipment (e.g., stove, toaster, heater, dryer). These extra costs tend to vary according to the number of people living in a house and the extent to which electrical appliances are used. .

Profit Before Taxes

After rearranging the information obtained from the income statement (Appendix 2.1), the level of profit (or income before taxes) should be the same as the one shown in Appendix 4.1. The only difference between the two appendices is how the cost or expenses were regrouped in the following way:

Net sales revenue	$27,965,000
Total variable costs	12,724,000
Contribution margin	15,241,000
Total fixed costs	10,379,000
Profit	$4,862,000

Break-Even Calculation

We now have all the information required to calculate the break-even point; net sales revenue, variable costs, fixed costs and the PV ratio. As shown in Appendix 4.1, TravelWorld Inc. will break even when it reaches $19,044,000 in net sales revenue (see under the heading break-even point). By dividing the total fixed costs of $10,379,000 by the PV ratio of 0.545, we get the break-even point. This means that TravelWorld Inc. is breaking even at 68% of the net sales revenue target ($19,044,000 ÷ $27,965,000).

Here are two examples of how the break-even point concept can be used as an effective decision-making tool.

Example 1

If TravelWorld Inc. wants to hire two additional employees at a cost of $50,000 each, how much more in net sales revenue must it generate to pay for these salaries without affecting its level of profit? All that is required here is to add $100,000 to the total fixed costs of $10,379,000. By dividing the 0.545 PV ratio, we get $19,227,523 ($10,479,000 ÷ 0.545). TravelWorld Inc. would therefore have to sell an extra $183,523 ($19,227,523 - $19,044,000). The question here is this: Will hiring two more employees generate an additional $183,523 in net sales revenue? Will they produce more profit or less?

Example 2

What would happen to TravelWorld Inc.'s profit level if its variable costs were reduced or increased by 5% and fixed costs remained the same? Here is the calculation:

	5% increase	5% decrease
Net sales revenue	$27,965,000	$27,965,000
Variable costs	13,360,020	12,087,800
Contribution margin	$14,604,980	$15,877,200
PV ratio	0.522	0.568

If TravelWorld Inc.'s variable costs increased by 5% due to higher wages or service costs, the company's profit would drop by $839,142 ($19,883,142 - $19,044,000). If TravelWorld Inc. wanted to maintain the same level of profitability, it would therefore have to cut back on some of its fixed costs or increase its sales revenue by $839,142.

On the other hand, if the variable costs were brought down due to a cost-reduction program, the company would increase its profit by $771,113 ($19,044,000 - $18,272,887). In this case, TravelWorld Inc. would increase its return on investment or, alternately, reduce its sales price to attract more customers and increase its share of the market.

Cash Break-Even

The break-even model can also be applied to solve cash-management problems. Most costs, such as rent, salaries, hydro, insurance, raw materials or telephone, are cash outlays. There are, however, other costs that are non-cash items, such as depreciation and amortization; even though they are treated as expenses, they do not entail an actual outflow of cash.

The cash break-even point is calculated in a similar way except that all costs related to depreciation ($2,770,000) are removed from the total fixed costs, which leaves $7,609,000 in cash fixed costs. The cash break-even point is calculated as follows:

Net sales revenue	$27,965,000
Total variable costs	12,724,000
Contribution margin	15,241,000
Total fixed costs	7,609,000
Profit before depreciation	$ 7,632,000

By dividing the cash fixed costs by the 0.545 PV ratio, we see that TravelWorld Inc. would break-even at $13,961,468 ($7,609,000 ÷ 0.545) or at 50% of the net sales revenue objective ($13,961,468 ÷ $27,965,000). This cash break-even point may be of interest to operators who open a new outlet or launch a new product or service that does not break even during the first year of operation but is able pay all cash fixed costs.

Profit Break-Even

Businesses are interested in more than just breaking even. Some establish profit objectives and determine the net sales revenue that should be obtained to reach them. When this is the case, all that is needed is to modify the break-even calculation. Referring to our base data in Appendix 4.1, and assuming that $5,500,000 is the objective (see profit objective section), the profit break-even point can be calculated as follows:

Fixed costs	$10,379,000
Profit objective	5,500,000
Total	$15,879,000 ÷ 0.545 = $29,135,780

Monthly Cash Budget

Monthly cash budgets are used for cash planning and control. They are also used for negotiating lines of credit with commercial banks. These budgets trace, on a monthly basis, the funds that will be: (1) available; and (2) required prior to their occurrence. In short, cash budgets keep track of the adequate monthly cash balances that a business needs, avoid unnecessary idle cash and possible cash shortages.

As shown in Appendix 4.2, the cash budget is usually broken down in four sections:

1. the cash receipt section;
2. the cash disbursement section;
3. the cash surplus or deficit section; and
4. the financing section.

The cash budget is prepared in two steps. The first step requires that all future receipts from cash sales and collections be identified for each month. The second step requires that all cash disbursements for individual expense items be pinpointed. The difference between the receipts and the disbursements gives either a net cash surplus or a deficiency.

Several departments must participate in the preparation of the cash budget, which requires a certain degree of judgment. For example, the sales department provides sales revenue figures, while the credit manager provides a breakdown of the approximate percentage of sales revenue that will be made on a cash basis, on credit, or paid within

30, 60, or 90 days. Various departmental heads also provide information on operating expenses related to purchases, wages, salaries, lease payments, etc.

The financial officer then determines the amount of cash that should be:

- kept in the bank at all times (cash at start of month);
- invested in short-term securities (surplus cash); and
- required from the bank in the form of a line of credit (outstanding loans).

The cash budget allows for deliberate planning for the efficient acquisition of funds and for short-term investments.

As shown in Appendix 4.2, total net sales revenue and expenses under the heading 'total' for the year (objective) are drawn from the income statement (Appendix 2.1).

In section 1 of Appendix 4.2 (cash receipts), the total amount of net sales revenue of $27,965,000 is broken down under each month. This allocation is based on the sales department's best estimates. The next step is to determine how much sales revenue is paid on a cash basis within 30 days and 60 days. As shown in the Appendix, 80% of TravelWorld Inc.'s sales are paid in cash; 15% within 30 days; and 5% in 60 days. As indicated in the Appendix, while $27,965,000 will be realized in net sales revenue, $27,932,000 represents the cash receipts.

In section 2 (cash disbursement), under the heading 'total', is a list of all expenses shown in Appendix 2.1. The only expense excluded is depreciation, which is not a cash disbursement. Additionally, one expense item needs to be adjusted: purchases. As shown, 20% of purchases are paid during the first month and the remaining 80%, during the second month. All other expenses listed in this section are drawn from Appendix 2.1, with the exception of the "purchase of assets" for the amount of $4,380,000. This is not an operating expense and therefore is not included in the income statement. Instead, it is a capital expense, and would be included in the capital budget. Nevertheless, during the year, TravelWorld Inc. will want to pay for the purchase of these assets in cash – unless, of course, the operator decides to obtain a loan to pay in part for some of them.

Section 3 shows the monthly differences between the total receipts and total disbursements. TravelWorld Inc. records surpluses during the months of April and May and from July to December. All other months (January, February, March and June) show deficit amounts. During the budget year, TravelWorld Inc. shows a surplus of $1,474,000.

Section 4 (financing) shows how much cash TravelWorld Inc. will require from the bank and how much will be invested in term deposits. The total surplus in this section is $1,574,000 – which is $100,000 more than the amount shown in section 3. The reason for this difference is the $100,000 cash balance that TravelWorld Inc. will have in the bank (see January column under the line, "beginning bank balance"). As can be seen, TravelWorld Inc. will require a working capital loan during the first three months of operations.

Capital Project Analysis

The third decision-making tool measures the economic desirability of investments in capital assets. The concept is easy to understand. If TravelWorld Inc. invests $100,000 in capital assets and generates a $15,000 profit a year, the project generates a 15% ($15,000 ÷ $100,000) return on its investment. If the cost of capital (money raised from investors, lenders and shareholders) were 10%, the company would probably go ahead with the project. However, to justify such important investment decisions, several more sophisticated capital budgeting tools can be used. These tools have to do with time-value of money; four of them are covered in this Guide:

1. The net present value (NPV)
2. The internal rate of return (IRR)
3. The payback period
4. The profitability index (PI).

The bottom of Appendix 4.3 shows the results of the calculations for these four decision-making tools.

Before exploring each of the above, it is important to understand the concept of the time-value of money. Money has a time value because of the existence of interest. If someone deposits $1,000 in the bank bearing a 10% interest rate, the passage of time allows the investor to earn $100 during the first year. This is called compounding, which means that a dollar earned today will be worth more tomorrow. To be sure, the element dealing with inflation must also be taken into consideration. If the inflation rate is 2%, the net amount that the investor earns would be 8%. Inflation within the context of capital investment will be examined later in this section.

The opposite also applies when a business invests in a capital project. For example, if a company invests $100,000 (cash outflow) to earn $20,000 (cash inflow) each year during the next five years, it would be unreasonable to compare the cumulative $100,000 cash inflow ($20,000 x 5 years) to the $100,000 initial cash

outflow. We would assume here that money would not have a time value. To make a reasonable comparison between the cash outflow and cash inflow, the investor would have to compound or discount (because of the time-value of money) all future cash inflows ($100,000)*.

Compounding

Using the above example, and assuming that the cost of money is 10%, here is how the concepts of compounding and discounting work. A $100,000 initial amount received as a gift at the beginning of the first year would be worth $161,100 at the end of the fifth year. The factor used to make this calculation is 1.611 (future value of a single sum). A yearly $20,000 amount received as gifts at the beginning of each year would be worth $132,520 at the end of five years. The factors used to do these calculations are drawn from interest tables. The $20,000 received at the beginning of Year One would be worth $32,220 at the end of Year Five. The $20,000 amount received at the beginning of Year Five would be worth $22,000 at the end of that year. In this particular case, it is more economically advantageous to receive the $100,000 lump sum at the beginning of Year One than the $20,000 yearly receipts.

The following shows how the compounding calculation works by using this illustration.

Year	One-time gift	Yearly gift		Compound factors		Compounded at 10%
1	$100,000	$20,000	x	(1.611)	=	$32,220
2	X	20,000	x	(1.464)	=	29,280
3	(1.611)	20,000	x	(1.331)	=	26,620
4		20,000	x	(1.120)	=	22,400
5		20,000	x	(1.100)	=	$ 22,000
Future Value	$161,100	$100,000				$132,520

Discounting

The same calculation could be made with discount factors. Instead of bringing the amounts to the future, we bring them down to the present. If you were to receive $20,000 at the end of each year instead of $100,000 today, the $20,000 amounts (or $100,000) would be worth $75,816 today, if discounted at 10%. The initial $100,000 is not discounted because it is received today. However, because the $20,000 amounts will be received in the future, they have to be discounted by using the annual discount factors shown below.

Years	One-time gift	Yearly gift	Discount factors	Present value at 10%
0	$100,000			
1		$20,000	(.90909)	$18,182
2		20,000	(.82645)	16,529
3		20,000	(.75131)	15,026
4		20,000	(.68301)	13,660
5		20,000	(.62092)	$12,419
Present value	$100,000	$100,000		$75,816

The bottom line is this: if you were to invest $100,000 in a capital project this year (or in Year Zero) that generate $20,000 annually over the next five years, the net present value (NPV) would be negative by $24,184 ($100,000 - $75,816). Who would want to invest $100,000 in a project that generates $20,000 each year (for a total of $100,000) during the next five years? As shown, the business would lose $24,184 if the cost of money was 10%.

If the investment generated $26,400 each year instead of $20,000, the present value of the yearly receipts would be $100,000 – i.e. the net present value would be ($100,000 - $100,000). If that were the case, the investor would make 10%. If the project's cost of capital was 10%, then the investor would break even after paying interest charges to the bank. If the project generated $30,000, the present value would be $113,724 and thus generate an extra $13,724 by using the same 10% discount rate. In this case, the investor would make more than 10%; to be exact he would earn 13%. This 13% discount rate makes the initial $100,000 investment equal the discounted cash inflows.

Now that we have a basic understanding of the conceptual framework of time-value of money, let's examine the time-value capital investment tools in terms of: (1) what they are; (2) what they do; and (3) how they are calculated.

Appendix 4.3 shows several steps and assumptions used for calculating the cash outflows, the cash inflows and the time value of money tools.

* To have a better understanding of the concept of compounding and discounting, refer to the financial management textbook, Pierre G. Bergeron, *Finance for Non-Financial Managers*, Third edition, Nelson Thomson Learning, 2002, pp. 249-263.

In Step One, TravelWorld Inc. identifies the amount of funds it invests. The amount shown in the Appendix is $2,600,000 (cash outflow), comprising the following assets:

Land	$350,000
Buildings	650,000
Machinery/equipment	500,000
Research and development	300,000
Other assets	200,000
Working capital	600,000
Total	$2,600,000

As shown, TravelWorld Inc. invests $2,000,000 in capital and intangible assets and an extra $600,000 in working capital (accounts receivable, inventory less accounts payable) during Years One and Two.

Another assumption is that the TravelWorld Inc. is in the 50% corporate income tax bracket.

Each asset has a different capital cost allowance rate (CCA), which is allowed by Canada Customs and Revenue Agency as a tax-deductible expense. As shown, the CCA rate used for buildings is 5%; for machinery and equipment, 20%; for research and equipment, 40%; and for other assets, 30%. The yearly total capital cost allowance (used for income tax deductions) is shown opposite the line with the heading, "Total capital cost allowance." As can be seen, the CCA amount for Year One is $156,000, for Year Two, $269,000, etc.

The second step focuses on the amount of cash inflow that the project will generate each year during its life span. TravelWorld Inc.'s yearly cash inflows for a 10-year period are shown in bold letters opposite the line with the heading 'cash flow'. As seen, in Year One TravelWorld Inc.'s project generates $253,000 in cash inflow, which is made up of the following:

Sales revenue	$1,300,000
Cost of goods sold	600,000
Gross margin	700,000
Selling and adm. expenses	350,000
CCA	156,000
Total tax deductible expenses	506,000
Income before taxes	194,000
Income taxes	97,000
Income after taxes	97,000
Add back CCA	156,000
Cash flow	$253,000

Inflation for both sales revenue and all costs (cost of goods sold, other expenses) are included in the forecast.

The fact that CCA is not a cash outflow expense (it is simply used for tax-relief purposes) is the reason for adding it back to the income after taxes amount.

As shown in the Appendix, the third step deals with calculating the net cash flow, or the difference between the cash outflows and the cash inflows. The total cash outflow in Year Zero is $2,000,000 and negative $47,000 in Year One. This records the difference between the investment of $300,000 in working capital and the cash inflow amounting to $253,000. The project shows positive cash inflows from years two to 10.

The fourth step deals with identifying the amount of cash that the company will receive at the end of the project's life span (Year Ten). As shown in the Appendix, TravelWorld Inc. expects to sell its assets for $1,000,000 and recover its entire working capital for the amount of $600,000.

Now that the project's estimates and assumptions have been pinned down and calculated, as shown at the bottom of Appendix 4.3, the spreadsheet calculates the payback period, the net present value, the internal rate of return and the profitability index.

Payback Period

What it is

This tool measures the period of time it takes for the cash outflows of the project to be totally recovered by the projected cash inflows.

What it does

Payback period measures 'time risk' rather than 'risk conditions'. The longer it takes for the initial investment to be recovered, the greater the risk. A firm engaged in a relatively stable industry (most tourist businesses fall in this category) will be more likely to accept projects with a longer payback period. However, a business establishment engaged in an industry where product obsolescence is a factor, and where there are abrupt technological changes (high-tech businesses), will require a shorter payback period.

How it works

This calculation is simple. If a project costs $100,000 and generates $25,000 in cash each year, the payback is 4 years ($100,000 ÷ $25,000).

As shown in Appendix 4.3, TravelWorld Inc.'s payback period is 4.8 years. This is the time period during which the cash flow turns from a negative (-$657,000) to a positive (+$144,000). On average, the project generates $66,750 each month ($801,000 ÷ 12) and it is during the tenth month that the $657,000 is totally recovered.

Net Present Value (NPV)

What it is

The net present value (NPV) tool measures the "difference" between the sum of all cash inflow and the cash outflow discounted at a predetermined interest rate, which sometimes reflects the company's weighted cost of capital.

What it does

This tool helps establish whether a project will yield a return that exceeds the cost of borrowing funds to undertake it. The rationale is relatively straightforward. If the net present value of a project, discounted at the company's cost of capital rate, is positive, the project may be classified as acceptable. If the resulting net amount is negative, it would be economically unattractive and therefore rejected.

How it works

Referring to WorldTravel Inc.'s project, the net present value of the $2,000,000 initial investment gives a positive $1,417,000. This means that if the yearly cash flows (from Year One to Year Ten) are discounted at the company's cost of capital (which in this case happens to be 11.46%), it gives $3,417,000. When the initial $2,000,000 initial cash outflow is deducted from the positive discounted cash inflow, it gives us a difference of $1,417,000. This simply means that TravelWorld Inc.'s project generates more than its cost of capital. The internal rate of return tool will tell us exactly how much more.

Internal Rate of Return (IRR)

What it is

The internal rate of return (IRR) tool can be described as the specific interest rate used to discount all future cash inflows, so that their present value "equals" the initial cash outflow.

What it does

This tool shows the economic merits of a project and helps compare its return to other financial indicators, such as the weighted cost of capital.

How it works

The internal rate of return is calculated in the same way as net present value, with one exception: when the initial cash disbursement "equals" the projected cash inflow (when discounted at a predetermined interest rate), it is referred to as the IRR. As shown in Appendix 4.3, the discount rate that makes all of WorldTrade Inc.'s cash inflows (that is, the undiscounted amount of $7,621,000) becomes $2,000,000 when a 22.18% rate is used. When this discounted amount is deducted from the $2,000,000 initial cash investment, it gives 0.

Profitability Index (PI)

What it is

The profitability index (PI), also known as the benefit-cost ratio, shows the ratio of the present value of the cash inflow to the present value of the cash outflow, discounted at a predetermined discount rate.

What it does

This tool helps gauge the economic attractiveness of a project by using a ratio.

How it works

Referring to TravelWorld Inc.'s project, for which the initial cash outflow is $2,000,000, and dividing this amount into the $3,417,000 discounted cash flow (using the cost of capital of 11.46%) gives 1.7. If the index is greater than 1.0, it means that the flow of cash discounted at a predetermined discount factor (e.g., cost of capital) is more than the disbursement. If it is less than 1.0, it means that the incoming cash flow of the project gives less than the discounted factor.

TravelWorld Inc.

Appendix 4.1

Break-Even Analysis

Break-Even Analysis In thousands of $	2000	2001	Objective
Net sales revenue	**22,342**	**25,082**	**27,965**
Variable costs			
Purchases	5,545	6,730	7,104
Freight In	123	210	290
Salaries (cost of goods sold)	4,621	4,765	5,140
Other charges (cost of goods sold)	22	32	40
Commissions	123	130	150
Total variable cost	**10,434**	**11,867**	**12,724**
Contribution margin	**11,908**	**13,215**	**15,241**
Fixed costs			
Salaries (selling)	3,603	3,904	4,304
Salaries (administrative expenses)	1,545	1,850	2,100
Travelling	37	40	45
Advertising	34	47	55
Other charges (selling)	21	25	30
Other charges (administration)	23	30	35
Leasing	123	130	140
rest income, interest changes, ext. expenses	1,155	949	900
Cash fixed costs	6,541	6,975	7,609
Depreciation (cogs, selling, administrative)	1,700	2,060	2,770
Total fixed costs	**8,241**	**9,035**	**10,379**
Profit (loss)	**3,667**	**4,180**	**4,862**
PV ratio	**0.533**	**0.527**	**0.545**
Break-even point			
Regular break-even	15,462	17,148	19,044
% of sales	69%	68%	68%
Cash break-even	12,272	13,239	13,961
% of sales	55%	53%	50%
Profit objective			
to make	4,500	5,000	5,500
you need to sell	23,905	26,638	29,136
to make	5,000	5,500	6,000
you need to sell	24,843	27,587	30,053
to make	5,500	6,000	6,500
you need to sell	25,781	28,536	30,970

TravelWorld Inc.

Appendix 4.2

Monthly Cash Budget

Monthly Cash Budget

In thousands of $

	Oct.	Nov.	Dec.
Sales revenue (previous year)	2000	1900	1700
Purchases			400
Payment schedule			
Cash sales = 80%	80%		
30-day payment = 15%	15%		
60-day payment = 5%	5%		
Purchase schedule			
Paid in 1st month = 20%	20%		
Paid during 2nd 60 days = 80%	80%		

		Jan.	Feb.	March	April	May	June	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1	**Cash Receipt Section**													
	Net sales revenue	1,000	1,800	2,100	2,300	2,500	2,400	3,500	3,400	2,900	2,300	1,900	1,865	27,965
	Cash sales = 80%	800	1,440	1,680	1,840	2,000	1,920	2,800	2,720	2,320	1,840	1,520	1,492	22,372
	30-payment = 15 %	255	150	270	315	345	375	360	525	510	435	345	285	4,170
	60-day payment = 5%	95	85	50	90	105	115	125	120	175	170	145	115	1,390
	Total monthly receipts	**1,150**	**1,675**	**2,000**	**2,245**	**2,450**	**2,410**	**3,285**	**3,365**	**3,005**	**2,445**	**2,010**	**1,892**	**27,932**
2	**Cash Disbursement Section**													
	Purchases	**500**	**350**	**400**	**450**	**760**	**700**	**900**	**1,000**	**700**	**650**	**350**	**344**	**7,104**
	Paid during 1st month = 20 %	100	70	80	90	152	140	180	200	140	130	70	69	1,421
	Paid during 2nd monty = 80 %	320	400	280	320	360	608	560	720	800	560	520	280	5,728
	Total monthly purchases	420	470	360	410	512	748	740	920	940	690	590	349	7,149
	Freight in	12	14	19	20	35	35	45	20	23	21	23	23	290
	Salaries (cost of goods sold)	300	350	400	425	500	500	450	456	439	440	450	430	5,140
	Other charges (cost of goods sold)	4	4	4	4	4	5	4	3	2	2	2	2	40
	Salaries (selling expenses)	350	375	350	415	420	410	340	402	310	322	310	300	4,304
	Commissions	10	10	11	10	13	17	17	15	14	11	11	11	150
	Travelling	4	4	5	4	5	4	4	4	4	3	2	2	45
	Advertising	2	2	2	4	5	6	7	7	6	5	5	4	55
	Other charges (selling, adm.)	3	2	2	3	2	3	2	3	2	3	2	3	30
	Salaries (administration)	150	180	170	170	150	180	170	145	155	220	200	210	2,100
	Other charges (administrative)	3	3	3	3	3	3	3	3	3	3	3	2	35
	Leasing	12	12	12	12	12	12	12	12	11	11	11	11	140
	Interest income	-1	-1	-1	-1	-1	-1	-1	-1	-1	-2	-2	-2	-15
	Interest charges	80	80	75	75	75	65	80	80	80	70	70	70	900
	Extraordinary expenses	0	0	10	0	0	0	5	0	0	0	0	0	15
	Taxes	0	0	450	0	0	400	0	0	450	0	0	400	1,700
	Purchase of assets	30	230	220	100	500	500	1,000	1,000	500	200	100	0	4,380
	Total cash disbursements	**1,379**	**1,735**	**2,092**	**1,654**	**2,235**	**2,887**	**2,878**	**3,069**	**2,938**	**1,999**	**1,777**	**1,815**	**26,458**
3	**Cash Surplus or Deficit Section**													
	Total receipts	1,150	1,675	2,000	2,245	2,450	2,410	3,285	3,365	3,005	2,445	2,010	1,892	27,932
	Total disbursements	1,379	1,735	2,092	1,654	2,235	2,887	2,878	3,069	2,938	1,999	1,777	1,815	26,458
	Surplus (deficit) month	**-229**	**-60**	**-92**	**591**	**215**	**-477**	**407**	**296**	**67**	**446**	**233**	**77**	**1,474**
4	**Financing Section**													
	Beginning bank balance	100	-129	-189	-281	310	525	48	455	751	818	1,264	1,497	
	Surplus (-deficit) month	-229	-60	-92	591	215	-477	407	296	67	446	233	77	
	Cumulative surplus (gain) deficit (-loan)	**-129**	**-189**	**-281**	**310**	**525**	**48**	**455**	**751**	**818**	**1,264**	**1,497**	**1,574**	

TravelWorld Inc.

Appendix 4.3

Capital Project Analysis

Capital Project Analysis

Years	Cost	Year 1	Year 2	Year 3	CCA
Capital assets					
Land	-350				0%
Buildings	-650				5%
Machinery/equipment	-500				20%
R&D	-300				40%
Other assets	-200				30%
Total assets	**-2,000**				
Working capital		**-300**	**-300**	**0**	
Total capital employed	**-2,600**				
Corporate tax rate				**50%**	

Years	0	1	2	3	4	5	6	7	8	9	10
Capital cost allowance											
Buildings		-16	-32	-30	-29	-27	-26	-25	-23	-22	-21
Machinery/equipment		-50	-90	-72	-58	-46	-37	-29	-24	-19	-15
R&D		-60	-96	-58	-35	-21	-12	-7	-4	-3	-2
Other assets		-30	-51	-36	-25	-17	-12	-9	-6	-4	-3
Total capital cost allowance		-156	-269	-195	-146	-111	-87	-70	-57	-48	-41
Total cumulative CCA		-156	-425	-620	-766	-878	-965	-1,035	-1,092	-1,140	-1,181
Res. value of assets based on CCA		-1,844	-1,575	-1,380	-1,234	-1,122	-1,035	-965	-908	-860	-819
Sales revenue		1,300	1,700	2,400	3,000	3,700	3,700	3,700	3,700	3,700	3,700
Cost of goods sold		600	700	990	1,240	1,560	1,560	1,560	1,560	1,560	1,560
Gross margin		700	1,000	1,410	1,760	2,140	2,140	2,140	2,140	2,140	2,140
Selling and administrative expenses		350	400	400	600	650	650	650	650	650	650
Income before CCA		350	600	1,010	1,160	1,490	1,490	1,490	1,490	1,490	1,490
CCA		156	269	195	146	111	87	70	57	48	41
Income before taxes		194	331	815	1,014	1,379	1,403	1,420	1,433	1,442	1,449
Income taxes		97	166	407	507	689	701	710	716	721	725
Income after taxes		**97**	**166**	**407**	**507**	**689**	**701**	**710**	**716**	**721**	**725**
Add back CCA		156	269	195	146	111	87	70	57	48	41
Cash flow		**253**	**434**	**603**	**653**	**801**	**789**	**780**	**774**	**769**	**765**
Pro-forma cash flow											
Purchase of assets	-2,000	0	0	0	0	0	0	0	0	0	0
Working capital	0	-300	-300	0	0	0	0	0	0	0	0
Pro-forma cash flow	0	253	434	603	653	801	789	780	774	769	765
Sale of assets	0	0	0	0	0	0	0	0	0	0	1,000
Recovery of working capital	0	0	0	0	0	0	0	0	0	0	600
Total cash flow	**-2,000**	**-47**	**134**	**603**	**653**	**801**	**789**	**780**	**774**	**769**	**2,365**

Payback period calculation											
Years	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Payback period (years)		-2,047	-1,913	-1,310	-657	144	932	1,712	2,486	3,255	5,620

NPV calculation	
Discount rate	11.46%
Net present value	**1,417**
IRR calculation	**22.18%**
Cost of capital	**11.46%**
PI index	**1.79**

Glossary for This Guide

After-tax cash flow: Total cash generated by an investment annually, defined as profit after tax plus depreciation.

Amortization: (1) A reduction in a debt or fund by period payments covering interest and part of principal. (2) Prorating the cost of an intangible asset over a specified number of years.

Assets: Resources that a business owns to produce goods and provide services; there are tangible assets, such as cash, inventory, land, and buildings, and intangible assets, such as patents and goodwill.

Break-even analysis: An analytical technique for studying the relationship among fixed cost, variable cost, and profit. The break-even point represents the value of sales at which total costs equal total revenues (that is, profit equals zero).

Budget: A quantitative expression of a plan of action against which future performance can be gauged.

Capital budget: Budget that shows how much will be spent for the purchase of capital assets.

Capital cost allowance (CCA): An allowable deduction under Canadian tax law for a capital asset's loss in value due to obsolescence and wear and tear.

Capital investment: Project that requires a significant amount of money (cash outflow) to generate a return (cash inflow).

Cash break-even: Number of units or amount of sales revenue that must be reached in order to cover total cash fixed costs (total fixed less depreciation).

Cash budget: A treasury function that determines the cash flow of business at the micro level; used to determine level of liquidity.

Cash flow: Income after taxes plus depreciation.

Cash inflow: Represents the receipt of money generated by sales revenue less expenses.

Compound interest: Interest rate applied to initial principal and accumulated interest of prior. Compounding is the process of determining the total amount of payments including all interest.

Contribution margin: The difference between sales revenue and variable costs.

Cost of capital: The cost of borrowing from investors (lenders and shareholders).

Discounting: The process of finding the present value of a series of future cash flows.

Fixed costs: Costs that remain constant at various levels of production.

Future value: The projected amount of a payment based on a specified interest rate and time period. How much a payment or series of payments will grow by a given future date when compounded by a given interest rate.

Inflation: A price rise characteristic of periods of prosperity.

Interest tables: Numbers found in compound or discount interest and annuity tables.

Internal rate of return (IRR): The interest rate used to discount all future cash inflows so that their present value equals the initial cash outflows.

Net present value (NPV): The present value of the future cash flows of an investment, less the initial cash outflows.

Payback period: The number of years required for a capital investment to generate enough undiscounted cash inflow to cover initial cash outflow.

Present value: The current value of a future payment or payments, discounted by an appropriate rate.

Profitability index: Ratio of the present values of cash inflow and cash outflow discounted at a predetermined interest rate.

PV ratio: Profit-volume ratio; the contribution margin expressed on per-unit basis.

Residual value: Value of an asset or business at the end of its physical life.

Revenue break-even: Sales revenue needed to cover total costs.

Time value of money: Rate at which the value of money is traded off as a function of time.

Variable cost: Costs that fluctuate according to changes in volume of production.