

ABSTRACT

International Project Valuation: A Capital Budgeting Decision

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In order to compete with heightened international competition, companies must diversify their operations into foreign markets. Baylor's I5 program serves to facilitate the expansion efforts of these companies by providing them with innovative projects, market research, and consultation. This thesis is intended to provide the students of the program with a guide on approaching the finance portion of their responsibilities. The guide is split into two parts. Part One explains how hyper-competition and a global economy have affected business' competitive landscape. It explains how various companies have responded by expanding internationally via different modes of entry. Part Two examines how to determine the financial health of a business. Next, the guide leads the students through a financial valuation of an international capital budgeting decision. Lastly, the guide explains how to interpret the results through the perspective of a potential lender who will finance the project.

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INTERNATIONAL PROJECT VALUATION: A CAPITAL BUDGETING DECISION

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by
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CHAPTER ONE

I5 Program Introduction

While the typical study abroad program enables its students to experience a new culture and to take courses abroad, it fails to provide them with a stimulating challenge. The I5 Program or Immersion into International Interdisciplinary Innovation is anything but the typical study abroad opportunity. It is an international journey, a challenge, and a team-driven value generator for the companies it serves. What makes the program unique is the international application and hands-on experience the students acquire working for a company overseas. In return, the companies receive innovative revenue-generating consultation and international research, a real bargain. The exponential growth and success of the program has enabled it to be selective, attracting only the sharpest business, computer science, and engineering majors Baylor University has to offer. These entrepreneurial-minded students have a strong desire to serve in the future as international leaders and the program prepares them to do just that. Working for their assigned businesses, the students dive into the business models and become ingrained in the mindset of upper management. They are challenged to utilize their creative thinking skills and problem-solving skills to enhance the company's growth through various innovative projects. The students have superb leadership via pre-trained MBA and Masters students, whom actively lead their company group. Students also benefit from Baylor professors, representing numerous departments, who guide them in interactive in-class preparation and case studies. The students conclude their five-week experience by presenting to the top management of the company, whom they have so arduously been

serving. In some cases, the companies have been so impressed by their student advisors, they have been known to ultimately offer job and internship placements.

CHAPTER TWO

Onset of a Competitive Global Environment

2.1 A Global Economy: The I5 Response to the Flattening of the World

“We are amid the flattening of the world,” according to Thomas L. Friedman. What he meant by ‘flattening’ was the rapid development of the world into a competitive arena, in which businesses have to compete not only domestically, but against foreign competitors thousands of miles away. He states “we are now in the process of connecting all the knowledge pools in the world together.” [1] This calls for celebration as the world seems to contract forming a global economy, an economy where products, human capital, labor, talent, and ideas move without restraint across geographic borders. These unfettered markets provide various advantages to companies such as the ability to obtain resources more cheaply abroad than internally. It also contains a downside; however, heightened supply has increased the competitive nature within most industries. As the opportunity to establish first-mover advantage presents itself, firms aggressively try to position themselves as efficiently and quickly as possible to reap as much market share as they can.

Besides the emergence of a global economy, the second driver of this hypercompetitive environment is the rapid pace of technological change. The global economy is increasingly being driven by these constant innovations. The rate of technological diffusion, or speed to which new technologies become used and are available, has been bullish in recent years. Also, perpetual innovativeness has caused a

shortening in product lives as new technology-intensive products are replaced that much sooner. Reaping the value from these innovations now depend heavily on the speed to the market because product differentiation is not indistinguishable. Due to this increasing rate of technological diffusion, even patents that once were a source of competitive advantage cannot be sustained.

2.2 Hyper Competition

As you can see in light of this hyper competition, margins have never been so tightly squeezed. Obtaining above-average returns on investment projects has become more difficult and companies cannot afford the sunk costs from large investments in research and development spending for a product that becomes obsolete within days. Without investments in research and development, the United States will have difficulty competing in a knowledge-based global economy.

The likelihood of maintaining a competitive advantage for most companies relies heavily on their ability to compete on a global scale. Now more than ever, companies are realizing the importance of mitigating the risks that are inherent with this global economy. They are aware that international competition results in greater volatility within their markets and that much of the growth will come from within emerging economies such as Brazil, India, and, most importantly per our purposes, China.

As students of the I5 Program, these companies have confided in you in hopes that you can provide insightful, results-driven guidance to make them better poised within their industry to compete within this global economy. The main challenge you

face is working together as a team and combining your unique educational expertise to form innovative solutions. The team is to expound upon those ideas and commercialize or produce a process that converts those ideas into viable business instruments.

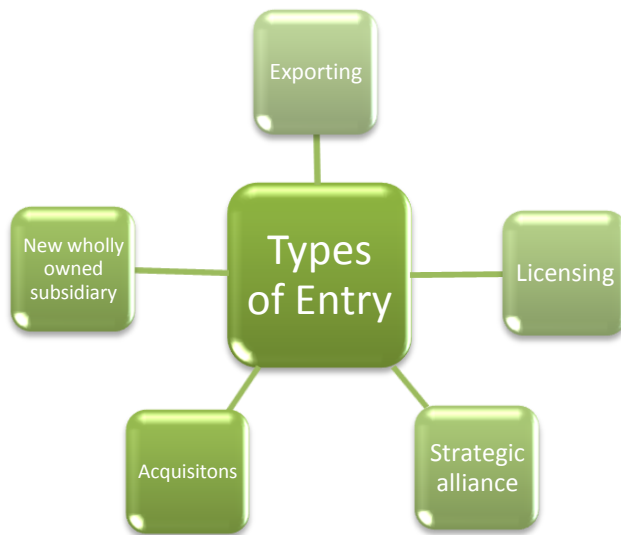
Prior to determining your company's investment and financing decisions that will lead it to higher margins, you must analyze the options your company weighed prior to expanding internationally.

2.3 Entry into Foreign Markets

Presently, the companies represented might have either already initiated certain entry methods within Southeast Asia or are valuing the decision whether to attempt additional alternatives. For this reason, understanding the way your companies have or attempt to successfully enter foreign markets is vital. Companies have several international modes of entry and can indulge in multiple avenues simultaneously. These various methods range significantly in terms of overall cost to initiate, control of operations, risks inherent, and potential returns. Until a firm is confident in their abilities to handle overseas operations, they should greatly weigh their options before possibly borrowing the funds to expand internationally.

2.4 Modes of entry

The five major forms of international market entry are exporting, licensing/franchising, strategic alliance, mergers and acquisitions, and new wholly-owned subsidiary.



For our purposes, the first three tactics of exporting, licensing, and strategic alliances are the best tactics for early market development. Exporting is the initial avenue of entry into foreign markets for the small, to mid-sized firms, applicable to a large portion of I5 participants. According to U.S. News World and Report: “The number of small U.S. firms using an international strategy is increasing, with some predicting that up to 50 percent of small U.S. firms will be involved in international trade by 2018, most of them through export.” [2] Exporting can increase revenues greatly; however, high transportation costs can rapidly eliminate healthy margins.

An entry mode where companies of foreign nations purchase the right to produce and sell your company's products is called "licensing." Usually, the licensor, (i.e., your company) would receive a royalty per unit sold in the foreign market. The disadvantage of this method is the low amount of control your firm has on how their products are portrayed in the foreign market. The host licensee may manufacture a low-quality version of your product with a low mean-time- before-failure when your company worked so hard to maintain the reputation of a durable brand. [3]

In light of all the inherent risks, for the seed companies that some of you represent, strategic alliances serve to mitigate risk by sharing costs. For the majority of I5 companies, this mode of entry is appealing because strategic alliances enable two companies to partner and share resources which might serve to enhance technology-based capabilities. This could lead your firm to develop new core competencies; however, the downside is that your company might not share a common culture with its potential partner.

In countries known to have a corrupt nature, a joint venture might serve as the best mode of entry. Joint ventures are a form of strategic alliance where two or more companies create a legally independent company and share resources and capabilities to operate it. [3] Alternatively, in countries where corruption is not an issue, cross-border acquisitions serve to be the quickest way to enter international markets.

Lastly, forming a new wholly-owned subsidiary may be preferred if intellectual property (IP) rights in the emerging economy are in danger of being infringed upon. Many of the high-tech companies that the I5Program serves could potentially benefit from this form of entry to safeguard their proprietary innovations. Also, in an emerging

economy where intellectual property is not well protected, wholly-owned subsidiaries are preferred when the number of firms in the industry is increasing, and global integration risk is high.

2.5 Managing Intellectual Property within Foreign Markets

Companies that participate in the I5 Program also benefit from its consultants' industry knowledge in foreign intellectual property protection. Many companies are surprisingly unaware of the importance and complexity of obtaining patent protection in foreign countries. Being unaware subjects these companies to great losses in proprietary knowledge and priceless intangible assets.

On one occasion, the I5 Program was advising a well-known international large company. The company was adamant about keeping their knowledge a trade secret. They did not file domestically because of this; however, the company had filed an application in the United States. They were unaware that the patent would be published in eighteen months. With a simple internet search of the company, domestic competitors would be able to reach their unprotected confidential information. This mishap could have potentially cost the company large losses, while simultaneously lowering their enterprise value. There are also many cases where the I5 Program will recognize patentable knowledge or methodologies unbeknownst to firm management.

Corporations are consistently undervaluing the importance of their intellectual property. It is very easy to recognize patentable material. The invention/innovation must

solve a problem, meet a need, and be the first mover. With some exceptions, these are the general guidelines on qualification.

The United States arguably has the most sophisticated intellectual law in the world. The process of obtaining a patent in the United States is not only cheap compared to other countries, but it is also a very good investment because of strict enforcement. Companies can expect to spend around \$50,000 in the United States, while in other countries, the process could cost between 1-2 million dollars. The worst part about foreign investment in patents is the risk of spending extensive funds on patent protection just to find that the enforcement of the patent is ineffective. For example, in China, it is very difficult to obtain a patent, and although enforcement is strengthening, infringement is prevalent.

Thus, when deciding whether to file for patent protection in foreign nations there are multiple factors to consider. It is important to identify what markets will the invention target. Next, are the high costs of protection justified? Lastly, how effective will enforcement be in the foreign nation?

In summary, firms must consult a patent lawyer before disclosing their invention in any foreign nation.

CHAPTER THREE

Investment and Analyst Outlook

Firms use these five ways to break into foreign nation's markets in essence diversifying their investments and mitigating their specific country risk. According to the Journal of International Business Studies, "as firms diversify their investments internationally their returns take a temporary dip initially." [4] After crafting the appropriate methods to managing their operations overseas, returns increase quickly. Looking backward at the time of the international diversification, if your company is publically traded, they might have experienced a positive leap in the value of their equity. The analysts that had been following your company most likely regarded this international expansion a positive thing, increasing overall growth potentials and possibly rendering the company with higher projected free-cash-flows in the future. Analysts generally find the news especially appealing when the firms that are choosing to initiate the strategy are diversifying into core business areas.

The main benefit sparking analyst's positive evaluations stems from the new products and processes that are acquired by firms when they move into new markets. Firms reap the highest intangible benefits when they absorb these new ideas and in turn incorporate them into their own research and development operations. Witnessing and observing foreign firm's unique functionality enhances their innovative thinking. The enlightenment may cause the firm to suddenly become aware of some hidden weaknesses or strengths. Firms fully capitalize on this new knowledge through new innovations.

This is an example of how firms practice technology commercialization abroad to create additional revenue-generating projects. “Innovative firms on average boast high profit margin growth on average around 3 percent higher than their comparable peers.” [3] Through the trial and error of technology commercialization, firms often successfully invest in effective research and development. As a result, their success will incentivize additional investment into their technology development. The future projects risks are mitigated and discounted at a lesser percentage by potential investors. The rationale behind the now ever more attentive investors is because of the decrease in the perceived risk inherent in the investment option. Post financial crisis of 2007-2008 investors are more cautious when evaluating risky investments. Investing in companies whose value is contingent upon its capital expenditures in technology commercialization projects, however, provides them with an international investment option. They successfully diversify their risks by investing in this company and simultaneously in a purely domestic comparable firm. Through diversification firms allocate only a portion of their available funds for investment in the risky project and mitigate their portfolio’s overall perceived risk.

Summary

Thus far we have described the current global economy in which we live in accompanied by hyper competition. We have also analyzed the multiple ways by which our respective firms entered their foreign market segments. Next, we deciphered how this market penetration served to commercialize their technology into above average investment returns. In addition, we discussed how increasingly efficient capital

expenditures in research and development help to replenish and steadily increase working capital to serve in funding for added projects.

CHAPTER FOUR

International Capital Budgeting

4.1 Analyzing Financial Performance

Once you understand the strategy your company has employed to obtain the opportunity to expand into foreign markets, you must work to comprehend your company's financial status and how future decisions will affect it financially. Also, you must work to understand how your team's projects or innovative strategy recommendations translate into an increase in financial risk to the company's health and its future existence. The ways in which you ensure the successful implementation of your project or innovation require that you understand several financial concepts: the current financial situation of the company, how each of your recommendations will generate eventual profits for the company, the options the company has to fund its projects, and how an inadequate borrowing base can constrain the possibility of project implementation.

In order to provide effective guidance as consultants of your company, you must be up to speed on the current financial position of the company you represent. The executives of your company, who you will likely meet, are very familiar with their financial performance and interested on how to improve. They are interested in these metrics for several reasons. Their compensation could be tied to the fulfillment of certain financial metrics, they could have vesting options of the company, but most likely they

are interesting in generating wealth for their stakeholders. [5] The ability to have an intelligent conversation on these matters might present itself, thus you should prepare with this in mind. Financial Analysis is the tool by which you can identify financial strengths and weaknesses of your company. We can effectively prepare this analysis through the use of financial ratios. You can use these ratios to answer some important questions about your firm's operations, which in turn, could help you to tailor your project recommendations. We can interpret our findings by comparing the ratios to both the company's historical year's ratios and also to industry norms. The Risk Management Association publishes a book that details every industry average ratio you would need to compare to. You might be able to find a copy in the library or in the Finance/Risk Management departments prior to the trip. You would only need to copy one page from the book that includes all the necessary ratios. The last way one could compare would be to find a comparable company publically-traded and determine its ratios for comparison. Be sure to compare companies that are near in total enterprise value and which have the same financial structure. [6]

First, we will observe the liquidity of the company. Liquidity is a measure of the firm's ability to meet its short-term obligations or meet maturing debt obligations.

Compute the current ratio and the quick ratio in order to measure liquidity.

$$\text{Current Ratio} = \text{Current Assets} / \text{Current Liabilities}$$

Look to the balance sheet to find these figures. The current ratio examines the ability of the company to convert its assets within a year to meet its short-term liabilities. The second ratio you should use to calculate liquidity is the quick ratio.

$$\text{Quick Ratio} = \text{Cash} + \text{Accounts Receivable} / \text{Current Liabilities}$$

In the Quick Ratio, also called the Acid-test ratio, we can view the company's liquidity excluding the least liquid current asset inventory.

The second set of ratios you should examine will assist you in understanding how effectively the firm is managing their operations and assets.

The best way to analyze the company's profitability is by comparing profits to sales. Do this by calculating the gross profit margin and operating profit margin:

$$\text{Gross Profit Margin} = \text{Gross Profits} / \text{Sales}$$

$$\text{Operating Profit Margin} = \text{Operating Profits} / \text{Sales}$$

Look to the income statement to analyze these figures. The value drivers of the gross profit margin are the sales price per unit or service sold and the costs included in manufacturing or obtaining the firm's products. When analyzing this ratio, keep in mind that gross profit margin does not incorporate such costs as marketing and distributing the firm's products. Operating profit margins are often preferred because it does incorporate these vital costs, although, excludes financing policies. The operating expenses such as general and administrative, and marketing and distribution drive this margin.

Analyzing how the firm is managing its assets enables you to measure asset efficiency. The main ratio we use to calculate this is the Total Asset Turnover Ratio:

$$\text{Total Asset Turnover} = \text{Sales} / \text{Total Assets}$$

You must reference both the balance sheet and income statement for this calculation.

This tells you the amount of sales the company is generating from assets. (For every dollar of assets the firm has, it produces x dollars of revenue.)

Next as the analyst, you must determine how the firm has been financing its assets. Are they using debt or equity? The debt ratio gives us the percentage of debt that finances the company. All you have to do to find the amount of equity is $1 - \text{Debt Ratio}$.

$$\text{Debt Ratio} = \text{Total Debt} / \text{Total Assets}$$

Look to the balance sheet to obtain these figures. The second ratio examines your firm's ability to service debt obligations as portions of long-term financing come due. The times interest earned ratio shows the number of times we are able to earn our interest.

$$\text{Times Interest Earned} = \text{Operating Profit} / \text{Interest Expense}$$

Lastly, you can determine if the profitability on the owner's (stockholders) investment is attractive. You calculate this via the Return on Equity ratio.

$$\text{Return on Equity} = \text{Net Income} / \text{Common Equity}$$

Utilize both the balance sheet and income statement for this calculation. Remember that the return on equity is highly affected by the amount of leverage as well. In order to compare this and use the information correctly, it is mandatory that you compare to a benchmark that has comparable financial structure as your firm.

Analyzing the financials by calculating these specific financial ratios will provide you with an understanding of the company's historical performance compared to its last twelve months and give you an idea of their prospective growth. It will also help you as we will determine later how the size of projects affects these ratios.

4.2 Financial Evaluation of Project

Once you have developed innovative projects for the firm to implement, you must then evaluate whether each project will be profitable for the company. You can analyze the desirability of the project via capital budgeting. This process is particularly crucial for management as accepting unprofitable projects destroys their goal in creating shareholder value. Through the capital budgeting process, the company will determine each project investment's rate of return. Due to the high risk associated with developing international expansion or growth projects, it is imperative for these companies to provide stakeholders confidence with their decisions. Capital budgeting provides an effective way to portray the merits of their investments.

4.3 Capital Budgeting – The Investment Decision

Capital budgeting is valuable because it allows high-growth companies to formulate and plan out long-term decisions and goals for the future. The process not only helps you to determine the profitability of your project, but also provides you with calculations that you can use to compare competing projects. Since there is most-likely a constraint on how much capital you can borrow to fund projects, you must determine which project will generate the highest return while holding the funding amount constant.

Taking on your project will affect the future cash flows of the company. The capital budgeting process assists you in forecasting and estimating the project's future cash flows and monitoring and controlling the appropriate capital expenditures necessary to implement the project. In summary, the process portrays the projected cash outflows

and inflows of the implementation of your project or resource. The unique nature of your international capital budgeting should include foreign risk within its calculations. You can include these risks throughout your evaluations when modeling your forecasts. This will be detailed later in the paper as well. You can use Microsoft Excel in order to model your project's forecasted financials.

4.4 Project Revenues

A large part of your research that contributed to your final project choices entailed analyzing the opportunity for potential market share and customers. Use this research to develop a reasonable operating revenue from sales of the product/service. Depending on your project's life time, forecast annual sales growth that match your predictions, but remain realistic. It is common to decrease incremental sales growth in later years to portray the greater difficulty of reaching untapped market share.

4.5 Project Costs

The first and most basic task for verifying the validity of a project stems from estimating the project's costs. All pertinent costs of the project must be included within this forecast. The timeframe for the costs should range from the beginning of product development to full implementation capabilities. Do not withhold any uncertain costs in order to compensate for the inherent uncertainty of international risk. You can use this list below to uncover potential costs for your project: [7]

- Include the actual purchase price of any assets your company will need to require
 - As well as any future investments for the assets
- Development Costs/Fees
- Personnel costs
 - Cost of labor
 - Travel costs
 - Staff overhead
- Costs for equipment
 - Also you want to realize the depreciation schedule to incorporate this cost in the model. An example on page* will illustrate this principle.
- Costs for permits and licenses
- Costs for patents and patent protection applicable
- Engineer costs
- Training costs
- Insurance
- Working capital requirements
 - Cash company utilize prior to receiving revenue
 - Time difference between payment of operating costs and receipt of project's revenue
 - Note: remember to increase cost requirements as they correlate with sales increases
- Inventories
- Taxes

- Financing Fees
 - Loan Underwriting
 - Cost of lender's advisement
 - Interest
 - Commitment fees
 - Other

Projects can run into delays, cost overruns, and regulatory restrictions that can all delay or increase the projected cost of the project.

In order to forecast the potential future profits of your project, your team must make some assumptions. You must refer to your research as evidence to support the assumptions that contributed to the projected financials. You can provide your company with a range of forecasts by creating several models. You can forecast project revenue and costs using best case, average, and worst case assumptions.

You can provide the insight of your projects' impact by adding its incremental operating cash flows to your company's forecasted financials. Check to see if they have provided you with projected financial information including estimated sales growth or projected cash flow or profit and loss statements.

The incremental operating cash flow after taxes for a project in a firm is given by:

$$\begin{aligned} &\text{Change in Operating Cash Flow} \\ &= (\text{Change in Revenues} - \text{Change in Costs}) * (1 - \text{Tax Rate}) + \text{Tax Rate} * \text{Change} \\ &\quad \text{in Depreciation} \end{aligned}$$

After calculating the change in operating cash flow, you should calculate the project's change in net cash flow to reflect the total impact of the project.

4.6 Three Methods of Evaluating Investment Decision

There are three main tools used by organizations to financially determine whether or not to proceed with investment decisions. The three methods are by means of calculation are the payback period, the net present value, and the internal rate of return.

[7]

4.6.1 Payback Period

The basic and quick method commonly used to evaluate the merits of a project is the payback period method. The payback period represents the length of time it takes the firm to recover the project's initial investment.

$$\text{Payback Period} = \text{Total Project Cost} / \text{Annual Cash Inflow}$$

Despite the fact that this calculation ignores returns after the end of the payback period, it provides a useful check for firms that aim for a benchmark project payback period. This evaluation method is most commonly used by small firms in correlation with small and simple investments. Below is an example to help understand this method:

Clothing International is considering the purchase of a new packaging machine for \$150,000. The machine will generate \$30,000 annually in operating cost savings. What is the machine's payback period?

Answer: $\$150,000 / \$30,000 = 5$ years

The net present value analysis is the second method used to analyze the profitability of a project. The method is more comprehensive and requires greater

calculation, but provides a more efficient form of evaluation. The net present value is the value of a specific stream of future cash flows presented in today's dollars.* To calculate the net present value you must compare the initial cost of the project to the total value of future revenue or the difference between project cash outflows and inflows. This method is more effective because it takes into consideration the time value of money. The analysis includes discounting future cash flows to represent their uncertainty and the fact that receiving cash in the future is less than receiving it today. After calculating the discounted cash flows, subtract the cash inflows and outflows to receive the net present value. Typically companies accept the project if the value of the net present value is positive.

4.6.2 Calculating Net Present Value for an International Project

Helicopter International Associates, a US based company, has traditionally only conducted projects domestically. However, they are currently considering launching a project in Hong Kong in which all funds will be repatriated back to the firm. It has been determined that the opportunity cost of capital (or discount rate) for the project is 18.22%. As of today, the 1-year forward rate for the Hong Kong Dollar (HKD) is 0.121300 with a spot rate of 0.128385. Based on the cash flows in the chart below, what is the project's net present value?

Year	Cash Flow (Dollar (HKD))
0	(44,653)

1	29,785
2	31,423
3	33,391
4	34,212

Steps to Answer:

First you must change from Hong Kong Dollars to US Dollars:

1. Calculate the interest differential:

$$0.121300/0.128385 = 0.944814$$

2. Calculate forward exchange rates:

$$\text{Year 0: } 0.128385 * (0.944814)^0 = 0.128385$$

$$\text{Year 1: } 0.128385 * (0.944814)^1 = 0.121300$$

$$\text{Year 2: } 0.128385 * (0.944814)^2 = 0.114606$$

$$\text{Year 3: } 0.128385 * (0.944814)^3 = 0.108281$$

$$\text{Year 4: } 0.128385 * (0.944814)^4 = 0.102306$$

3. Convert to per US from in US\$

$$\text{Year 0: } 1/0.128385 = 7.789072$$

$$\text{Year 1: } 1/0.128385 = 8.244023$$

$$\text{Year 2: } 1/0.114606 = 8.725547$$

$$\text{Year 3: } 1/0.108281 = 9.235231$$

$$\text{Year 4: } 1/0.102306 = 9.774598$$

4. Convert cash flows to USD:

$$\text{Year 0: } 7.789072 * -44,653 = -347,805.43$$

Year 1: $8.244023 * 29,785 = 245,248.23$

Year 2: $8.725547 * 31,423 = 274,182.86$

Year 3: $9.235231 * 33,391 = 308,373.60$

Year 4: $9.774598 * 34,212 = 334,408.55$

After obtaining the cash flows in USD you can use two methods to calculate the net present value.

Using the Calculator:

- First, enter 18.22 into the for your discount rate
- Next, enter the negative initial cash outlay of -347,805.43 by pressing the CF button on the calculator it should read CF0
- Enter cash flows for the next years and press the button again and after each entry
- Lastly, press the 2nd command and choose the NPV button
- Net Present Value should equal
 - $NPV = \$413,924.38$

If you do not have the luxury of a financial calculator manually discount each year's future cash flow by using this equation. t = time period of cash flow

$$NPV_t = \text{CashFlow}_t / (1 + \text{discount rate})^t$$

4.6.3 Internal Rate of Return

The internal rate of return method is used to determine the expected return on your project over its life. It is the discount rate at which the net present value of the project's cash flows equal to zero. Using the internal rates of return of multiple projects is useful for comparison.

Year	Cash Flows
0	-347,805.43
1	245,248.23
2	274,182.86
3	308,373.60
4	334,408.55

Using the same cash flows from the aforementioned net present value problem, we can determine the project's internal rate of return.

- Simply, enter all of the cash flows using your financial calculator as explained above
- Then, press the second button and then the IRR button
- $IRR = 66.26$

Again if you do not have the luxury of a financial calculator, you must practice trial and error to find the appropriate internal rate of return.

$$CF_0 + CF_1/(1+IRR) + CF_2/(1+IRR)^2 + CF_3/(1+IRR)^3 = 0$$

- If your calculation comes out above zero then adjust your assumed internal rate of return downward. If you retrieve a negative net present value adjust upward.

You can assume a reasonable benchmark required rate of return, or hurdle rate, for your firm's international projects, however, you should check with your firm to ensure that you use their preference to discount the cash flows.

You can refer to these criteria when determining whether to accept or reject projects.

Technique	Accept	Reject	Indifferent
NPV	> 0	< 0	$= 0$
IRR	$> k^*$	$< k^*$	$= k^*$

*Where k is the required rate of return on the project

CHAPTER FIVE

Project Finance

5.1 Financing Decision

Even though your project may produce a positive net present value and a high internal rate of return with a short payback period, these characteristics do not ensure that it is feasible. The capital requirements to implement your project might exceed the amount of debt you are able to take on. It is necessary to understand the proper source of financing for your project, what lenders are looking for, and how to judge the correct amount of financing your project is able to shoulder.

5.2 Where to Obtain Project Funding

Typically, international projects in developing countries have been financed via raising large corporate loans. Commercial banks in the past have provided private-sector companies with the majority of capital they need to fund their international projects. In 2001, 82% of private-sector companies sought out commercial banks to fund their international projects. [7]

Large commercial banks will typically have an international lending division or global lending division that focus on extending capital to assist with international expansion.

Commercial banks prefer to lend to existing companies that have a proven track record, steady sales and profits, and satisfied customers. These lenders are also looking for companies that have assets that they can place liens on. They use these assets as

collateral to the loan in case their clients are unable to service the debt payments.

Commercial banks also prefer to lend to companies with positive cash flows, in healthy industries and markets. Commercial banks are wary capital providers because they typically only earn around 1% on any one loan. [5]

Sometimes if the loan for your project is perceived to be very risky, commercial banks will require personal guarantees. One way commercial banks will alleviate its risk is by splitting the capital raise for your project with another bank. This essentially reduces their losses in case the borrower is unable to repay them. A large portion of the loans are intermediate-term loans that mature between 2-5 years. [5]

The amount of debt your project can raise will be based on its ability to pay interest and repay loan principal installments. Lenders are concerned with maintaining a comfortable margin of safety. They calculate several coverage ratios to help them quantify their risk exposure.

5.3 Coverage Ratio Analysis

The coverage ratios used are: [7]

- Annual Debt Service Coverage Ratio (ADSCR)
- Loan Life Coverage Ratio (LLCR)
- Project Life Coverage Ratio

5.3.1 Annual Debt Service Coverage Ratio

The projected annual debt service coverage ratio calculates the company's ability to service the debt from its annual cash flows.

$$\text{Annual Debt Service Coverage Ratio} = \text{Operating Cash Flow} / \text{Debt Service}$$

- Operating cash flow of the project over the year is the difference between operating revenues and operating expenses and ignoring any non-cash items such as depreciation. Corporate finance would use EBITDA in place of the cash flow, but this ratio should be based on cash flow rather than accounting results.
- Debt service of the project over a year refers to the interest payments and principle repayments due
- For example, if your project produces 120 in operating cash flows, 55 in interest payments, and loan repayments of 45 then your annual debt service coverage ratio would equal 1.2 ($120/(55+45)$)

Lenders might require a minimum ADSCR for each year so you have to ensure that the project will not fall to low in one year. The required ADSCRs fluctuate by project type and risk, however, higher cover levels would be required for most international projects. High cover requirements are also prevalent for projects commencing in foreign countries with high credit risk.

5.3.2 Loan Life Coverage Ratio

This calculation is very similar to the ADSCR, although, it is calculated over the whole term of the loan.

Loan Life Coverage Ratio = Projected Operating Cash flow/Debt Outstanding

- Projected operating cash flows are calculated the same as for ADSCR and are discounted to its net present value at the assumed interest rate for debt
- Debt outstanding is the amount of debt your firm has presently

Requirements for the loan life coverage ratio are normally 10% higher than the annual debt service coverage ratio requirements.*

5.3.3 Project Life Cover Ratio

The project life coverage ratio identifies how many times the cash flows after the project life can repay the debt outstanding. It shows whether the project has capacity to make repayments after the original final maturity of the debt. The extra amount of debt service is known as the “tail.” Lenders expect tails to be worth at least a year or two of cash flow coverage.

Characteristics that affect lender’s calculations of the tail are uncertainty of the cash flows in the years after the loan is due and the likely-hood that certain contracts or licenses remain valid. To calculate the tail the lenders use this formulate:

= Tail = Net Present Value of Total Project Cash Flows/Debt Outstanding

- To find the net present value of all future cash flows you must discount them all back to the future.

Lenders expect to see a higher project life coverage ratio compared to the project’s loan life coverage ratio and annual debt service coverage ratio. They are hopeful for at least a 15-20% higher LLCR than the minimum ADSCR.*

5.4 Calculating Coverage Ratios

Observing the example below we can see how our project cash flow projections, investing decisions, and ratio calculations all combine to form a cohesive financial decision. [7]

The example makes several assumptions:

- There is an even cash flow before debt service of \$220
- Assumes your company will require a \$1000 dollar loan
- The loan will be repaid in equal annual principal installments over a 10 year period
- Lastly, it assumes a 10% interest rate on the loan (= NPV discount rate)

In order to calculate the project life coverage ratio we can assume that the project will generate

\$200 of cash from years 11-13 after the loan matures. The net present value of these cash flows will be \$1499. So your project's life coverage ratio would equal 1.5 or (\$1499/\$1000).

Year:	0	1	2	3	4	5	6	7	8	9	10
(a) Operating Cash Flow		220	220	220	220	220	220	220	220	220	220
(b) NPV of Operating Cash Flow	1352	1267	1174	1071	958	834	697	547	382	200	
(c) Loan Repayments		100	100	100	100	100	100	100	100	100	100
(d) Loan Outstanding	1000	900	800	700	600	500	400	300	200	100	0
e Interest Payments		100	90	80	70	60	50	40	30	20	10
(f) Total Debt Service		200	190	180	170	160	150	140	130	120	110
ADSCR = (a/f)		1.10	1.16	1.22	1.29	1.38	1.47	1.57	1.7	1.83	2.00
LLCR (b/d)		1.35	1.41	1.47	1.53	1.60	1.67	1.74	1.82	1.91	2.00

Preferred coverage ratios exceed 1.0. The lower the discount rate, the higher the coverage ratios should be. International projects should have high ratios to entice lenders to provide the needed capital.

CHAPTER SIX

Conclusion

6.1 Conclusion

This paper is meant to provide the I5 participants with a guide on how to approach their project's financials and make the numbers talk. Many of the calculations used will be based on subjective assumptions, so it is necessary to include sufficient market research to contribute to the legitimacy of those assumptions. Students can leverage simple financial knowledge to complement their innovative international project ideas. They can evaluate the potential of a project by projecting its estimated net present value and determining if it has a sufficient internal rate of return. Lastly through the financing decision, they can determine the probability of their project receiving funding.

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