

# AN INTERNATIONAL CAPITAL BUDGETING EXPERIENTIAL EXERCISE

**Lee Tangedahl**  
**The University of Montana**  
**lee.tangedahl@business.umt.edu**

**Tim Manuel**  
**The University of Montana**

## ABSTRACT

*This paper describes an experiential exercise, based on a simulation model, which is intended to introduce students to the financial concepts arising from investments in foreign countries.*

## INTRODUCTION

This experiential exercise is intended for use in a Multinational Financial Management and Accounting course to give the students an insight into the important financial concepts of multinational business without delving into all the underlying financial theory. Specifically, the exercise will include the following financial concepts:

1. Inflation
2. Exchange rates
3. Hedging exchange rate risk
4. Borrowing in foreign country versus borrowing in U.S.
5. Economies of scale from operating in one country versus flexibility from operating in multiple countries
6. Labor cost advantages from incorporating low foreign wage rates
7. Government subsidies to operate in a given country
8. Ethical considerations, e.g. exploitation of cheap labor, paying bribes, good citizenship spending

The framework for the exercise is an international capital budgeting model (see below) in which the students make investment decisions that will require them to consider the concepts above. The students will be provided with a planning spreadsheet that will enable them to evaluate their possible investment decisions. The students will first estimate the stochastic environmental variables (inflation rates, variable costs, and productivity) based on information provided by the instructor and then manipulate decision variables to achieve the maximum adjusted present value of the resulting cash flows. The spreadsheet does much of the work (conversions, calculations, etc.) and produces the necessary financial statements including adjusted present value of the investment decisions. After the students have used their planning spreadsheet to establish a set of investment decisions, the instructor will generate a set of “actual” environmental

conditions including the stochastic variables (inflation rates, variable costs, and productivity) and the students will go back to their spreadsheet to re-evaluate their decisions in light of these conditions. The exercise is not intended to be a study in financial theory, rather it is intended to bring the above concepts into play so the students may observe the (simulated) financial outcomes and discuss the consequences of their investment decisions in class. Hopefully the students will get a feel for both the financial “truths” (e.g. currency conversion or the adjusted present value of a series of cash flows) and the financial uncertainties (future inflation and exchange rates or the financial value of good citizenship spending) that exist in the real world.

## THE MODEL

The simulation model is written in Microsoft Excel with Visual Basic for Applications macro subroutines. The model includes the following decision variables:

1. Investment in one or two foreign countries
2. Level of investment in each country
3. Borrowing in the local country or in the U.S.
4. Opportunity to hedge exchange rate risk
5. Level of good citizenship spending
6. Payment of bribes

The two foreign countries will be a “medium developed country” and a “lower developed country”. Investment in the lower developed country will benefit from lower wage rates and higher government subsidy but face a greater volatility in variable costs, output per hour, inflation and exchange rates in comparison to the medium developed country. The level of investment determines the capital required and leads to the level of revenue generated. A higher level of investment in one country also leads to economies of scale by providing a higher level of revenue per dollar invested. The option to borrow in the local country enables the student to receive government subsidies but subjects the repayment to exchange rate risk. The student may escape at least some of this exchange rate risk by opting to hedge the borrowing costs and “lock in” the rates for some of the value of the loan. Ethical decisions, e.g. good citizenship spending or payment of bribes, will stochastically influence the productivity and variable cost environmental

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variables. Class discussion of the ethical decisions will consider both the financial and ethical consequences.

The model includes the following stochastic environmental variables:

1. Inflation rates
2. Exchange rates
3. Productivity
4. Variable costs

The inflation rates are higher and more volatile for investments in the lower developed country. The exchange rates are based on the difference in inflation rates over the long run (purchasing power parity), but with short-term volatility. Productivity and variable costs are influenced by the level of good citizenship spending and by the payment of bribes. The stochastic variables are randomly generated to follow a normal distribution with the mean, standard deviation, and limits set by the instructor, setting limits effectively truncates the normal distribution. The instructor may also set the correlation between inflation rates and between exchange rates for the two countries. The stochastic variables should provide a range of outcomes that will influence the optimal decision and yet be valid in comparison with real world examples. The generation of stochastic variables is the primary difference between the simulation model (which is run by the instructor) and the students' planning spreadsheet. The instructor may create and save a scenario (including values for all stochastic variables) and the students can read that scenario into their worksheet.

Finally, model and the student planning spreadsheet also include numerous environmental constants (e.g. tax rates and interest rates in the foreign countries and in the U.S., price per unit sold, financing subsidy from the foreign countries, etc.). Note that this model is not a marketing simulation so price is fixed, demand is not a stochastic variable, and it is assumed that all production will be sold.

## RESULTS

The simulation model was first used in a Multinational Financial Management class this past semester. The students first got a feel for the model using constant data and then with various scenarios created by the instructor. The students were then divided into teams and each team was provided with a scenario to thoroughly analyze and determine the optimal set of decisions. Each team made a presentation to the class including their scenario, their analysis, and their optimal decisions. Finally the class discussed the effects of the various scenarios on the set of optimal decisions and seemed to have gained an understanding for the financial concepts involved in multinational financial decision-making. The class discussion focused on both financial and ethical considerations that would affect the decision-making. There were minor glitches, particularly in reading scenarios into the student worksheet, but overall the student evaluation of the exercise was very favorable.