
Understanding the Cost and Benefit in the Acquisition of Machinery

The nature of the project under consideration is to determine the cost benefit (loss minimization) to cash flow from the purchase a new piece of equipment. This project will take into account the cash flow repercussions from making this investment over a ten-year period of time which is detailed by the new machine's life plus the initial year of the purchase.

By purchasing a new machine, a smaller workforce is needed to operate such equipment, less losses will come from more efficient material usage, and overhead is reduced. These will be taken into consideration when looking at reduced projected costs (cost benefit) over this ten-year period. Also cash flow will receive gains from the sale of the old equipment previously used in the original production method if new machinery is purchased. The old machinery has 3 years of straight-line depreciation remaining. This means that the projects cash flows within the first three years will take into account depreciation opportunity costs.

The ultimate objective behind this analysis is to compare the Cash Flow benefits (Cost Saving) from both projects. Cost saving analysis will be the only method used because the

When looking at the cash flow expression, we disregard revenue gains because each year both processes produce the same amount of units. Change in net working capital remains at zero because differences between current assets and current liabilities in the production of units in both process remain the same year to year. All steps of the cash flow can be seen in Exhibit 1.

$$CF_t = -CAPEX + (\text{Cost Savings} - (D_{\text{new}} - D_{\text{old}}))(1 - \text{Tax Rate}) + D_{\text{new}}$$

If a new machine is purchased in the Principle year, it will cost a total of 25,500,000 € (25,000,000 for machine purchase, 500,000 for delivery). This will be multiplied by the spot rate cost of the INR/Euro of 72.951 because book keeping costs are account for in the INR. Selling the old machinery will generate 285,000 ZAR on the market, generating 758,302 INR (after 35% tax) of profits in capital expenditures. The total change in capital expenditures in the initial year will generate an outflow of cash (1,859,619) INR. Changes in capital expenditures only happen in the principle year because that is when all of the purchasing and selling of assets take place.

Next, cost savings will come from the difference of total operations cost (Materials, Labor, Overhead) of both process when run-at-rate. The cost savings will be denoted as a positive number because reduction of costs in the new process mean less cash needed to pay for in

Need help with the assignment?

Our professionals are ready to assist with any writing!

GET HELP

operating expenses. These specific cost differentials are detailed in Exhibit 2.

The net of the depreciation is then subtracted from cost savings inside of the EBIT. The net depreciation is the difference from the depreciation on the new machinery minus the depreciation on the old machinery. After the first three years of operating, the tax benefit opportunity from depreciation of the old machinery is lost. Then for the remaining seven-year life of the new machinery, the depreciation is subtracted from EBIT without any potential tax benefit. The positive cash flow in depreciation of the old machinery serves as place holder for the opportunity cost of selling that machine in the principle year. That cash flow is the only cash flow not defined in the traditional cash flow expression but must be accounted for.

Because Tiger Brand SA operates in many countries worldwide, market conditions are important to pay attention to when thinking about investing in a new project. Tiger, operating in both India and South Africa, must be concerned about a price inflation. In India, the growing middle class has started to goods at a rate that is outstripping supply, thus raising price inflation. Efforts by the Indian government to increase interest rates in order to slow down the economy where enacted.

South Africa at this time was facing mild inflation across a long term, but still maintained stable interest rates. Ultimately, this caused the Indian Rupee to weaken relative to the South African Rand. Rising appreciation of the Rupee should concern Tiger Brand because their operations in India could prove to be more costly than before. Because their headquarters is in South Africa, Tiger needs to financially analyze if investing in this new project is worth the cost.

Currently the Rupee is facing 7% inflation compared to the Rand which is inflating at only 4% for the next year. For years 2015 to 2021, the forecasted exchange rate is 4.0934 for the INR/ZAR. The following years from 2021 to 2025, the forecasted exchange rate is 5.25 for the INR/ZAR.

If Tiger wishes to invest in this new project in India, the net cash flow (not including the time value of money) is -1,168,602,493 INR. This takes account the cost reduction of investing in more efficient machinery. This can be seen in Exhibit 2. Before taking this negative number into account, the net present value of the cash flows must be analyzed.

There are two ways to calculate the net present value of the cash flows. There is the Parent View of finding the NPV and the Subsidiary View.

Using the Parent View, the spot exchange rate at any time can be forecasted using the purchase power parity. This says at the spot rate at time "t" can be found by this formula:

$$S_t = S_0 \frac{(1 + \text{inflation rate of the INR})}{(1 + \text{inflation rate of the ZAR})^t}$$

Need help with the assignment?

Our professionals are ready to assist with any writing!

GET HELP

Though the forecasted exchange rate can be found, the exchange rates are supposed to hold at 4.0934 INR/ZAR from 2015-2021 and 5.25 INR/ZAR from 2021-2025. These rates will be used to find the domestic value of the INR cash flow for each year of the new project.

The cash flow of every year from 2015-2021 is divided by 4.0934 and 2021-2025 is divided by 5.25 INR/ZAR. These yearly values (in ZAR) will be used when put into the net present value equation shown in Exhibit 5. The NPV used the discount rate of 12% to calculate the time value of money. The NPV (ZAR) for the new project is -367,204,203 ZAR. This is shown in Exhibit 3.

Using the Subsidiary View, the discount rate in INR (WACC) is calculated using the International Fisher Effect. The equation used to calculate the WACC is as follows and uses 12% discount rate for WACC of ZAR:

$$\text{WACC_INR} = ((1 + \text{WACC of ZAR}) * ((1 + \text{INF_INR}) / (1 + \text{INF_ZAR}))) - 1$$

The WACC used in finding the NPV is calculated out to 15.2308%. First to find the NPV using the subsidiary view, the NPV of the cash flow uses 15.2308% as the discount rate. After the NPV is found, it is divided by the spot rate of the currency at t=0. In this case, NPV of -1,518,407,368 INR is divided by 4.0934 to find the NPV of -370,940,384 ZAR. This is shown in Exhibit 4.

Given that all International Parity Relations hold, both methods of finding the NPV do not produce equal results. Even though these NPVs are very close, the inflation rates of both countries skew their equality (Exhibit 5). In this case we would look at the Parent View to make an analysis. But in both cases they yield a negative result in cash flow for the investment in the new project. The cash benefits provided by the increase in production efficiency do not outweigh the cost.

Significant variance in results may be derived by these two views if the parity relationship between these two currencies are violated. If inflation were to increase from 4% to 10% in South Africa, the Relative Purchase Power Parity says that the spot price of the INR should decrease.

If the ZAR inflated from 4% to 10%, the new expected spot rate for the INR/ZAR would be 3.981762. This changes the NPV of the ZAR in the Subsidiary View from -370,940,383 to -355,901,817.

In the Parent View, the new spot rate at t=0 would change the NPV of the ZAR from -367,204,203 to -379,940,610. The change in inflation would cause the NPV in the subsidiary view to increase and the NPV in the parent view to decrease further negative. This would happen in short range and eventually smooth out as the spot rates adjusted for the inflation

Need help with the assignment?

Our professionals are ready to assist with any writing!

GET HELP

shock in the parent view. (Shown in Exhibit 6).

gradesfixer.com

Need help with the assignment?

Our professionals are ready to assist with any writing!

GET HELP