Mechanism of Assessing Financial Feasibility Studies

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Abstract - Investment opportunities, markets and financial analysis are the key stone of any investment decision, for that it’s a very important to have a mechanism of assessing financial feasibility studies in due to the pre decision making process for this, the basic components that help to define, assess the project feasibility and investment opportunities. Aiming to find the components of which the project financial feasibility relies on. And the methodological steps which research must rely upon for project feasibility assessment. The study concluded that, the main purpose of any financial analyses of any investment opportunities must understand the financial impact by estimating precisely the size of the necessary financing to implement and operate the project. The literature review also identifies different sources of financing along with its costs. Finally, It is a differentiation between the proposed financing structures and selecting the most suitable procedure. The financial study, analyst must have the data and information required to formulate and analysis, in order to judge the extent of profitability of an investment.

Keywords: financial analysis, project feasibility, financial feasibility, feasibility assessment, Investment Cost, Operational Costs, Cash Flows and Financial Structure.

Introduction: The significance of a feasible study in terms of investment opportunities is revealed by determining the financial vision of any project after providing marketing and engineering components to identify costs and operation elements related to a product.

Any financial analysis begins after the confirmation for a marketing study to decide that there will be a sufficient demand on certain projects products or services. Positive results of any technical study decide the possibility to build the project from all technical aspects.

A financial study of the project is conducted to determine funds required for the establishment, operation, management and relevant obligations purposes to examine to what extent the project will achieve as a suitable return to its stakeholders.

Problem: The problem can be addressed by asking the following:

- What are the basic components that help to define assess the project feasibility and investment opportunities?

The problem rise a set of questions that can be illustrated by the following:

1. To what extent the project effectiveness is associated with the safety of selecting and incorporating the components of assessing financial feasibility?
2. What are the factors and forecasts that control financial feasibility assessment?
3. How to determine and assess the factors that control project success and acceptance along with investment decision criteria?
4. To what extent we must rely on decisions to accept or reject a particular project financially?

Hypothesis:

1. Feasibility is the basis of a set of foundations upon which all investment decisions rely on.
2. Projects assessment indicates comprehensive financial and socio-economic dimensions.
3. Each Investment decision or (financial decision) depends on ways of selecting core components and methodology Steps for assessing financial feasibility.
4. Financial assessment relies on collecting a project financial statement from technical, marketing and environmental aspects.

Objectives:

The objective can be identified by the following items;

1. Find the components of which the project financial feasibility relies on.
2. Find the methodology steps which research must rely upon for project feasibility assessment.

Based on the nature of the study, it’s divided into two parts. The first part includes the general framework of study and the basic components of assessing a financial feasibility. This part again divided into five subheadings. Each headings deals with one of the five components of the financial feasibility, namely, investment cost, operational costs, cash flows, project profitability, and national profitability of...
projects. While the second part has examined the Methodology Steps for assessing financial feasibility considered as a set of foundations followed by the stakeholder to assess the project financially. The second part has been divided into twelve subheadings, each of those headings deals with certain step to assess the financial feasibility in sequence and defined in the research plan.

1. BASIC COMPONENTS FOR ASSESSING A FINANCIAL FEASIBILITY (Abu Jamie, 2014)

Introduction: The purpose of financial analysis of a project is to determine the extent of project matching or investment thinking with the identified investing criteria, i.e, to ensure that the project achieves an acceptable level of business profitability. This could be reached by collecting and analyzing the financial statement of the market along with the technical aspects to create financial statements related to the project operation plan.

The feasibility study is based on several data and information to various aspects of project costs which are analyzed and classified as financial statements. Obviously, there is no standard pattern to financial statements. So, their numbers, types and components rely on many factors concerned with the nature of, and the requirements to any project.

Usually the statements achieved by initial financial analysis are never sufficient to make a final decision about the project as far as the investors are concerned.

This requires what is so-called a sensitivity analysis, which includes access to further data and information on the relevant aspects of profitability, probability, risks, sensitivity analysis, opportunities, environmental variables and changes occur to such aspects.

Definition of Basic Components for Assessing a Financial Feasibility (Abu Jamie, and migdad, 2016)

Set of Components through which the financial study is analyzed, as follows:

- Investment Cost
- Operational Costs
- Cash Flows and Financial Structure
- Project Profitability
- National Profitability of Projects

1.1 Investment Cost (Abu Jamie, and migdad, 2016)

Represented by the total amounts required to establish any project. Investment cost is usually estimated by:

- The Investment Cost of Productive Assets
- Incorporation Expenses
- Working Capital
- External Financing Cost during Project Establishment

1.1.1 The Investment Cost of Productive Assets

To estimate any investment cost of productive assets is to determine the project site, productivity, equipment, set all technical specifications, consider the prices, what is locally manufactured and supplied.

Usually the data and information are provided by a team to discuss all data and information to be assessed based on certain specifications of financial and economic experts.

1.1.2 Incorporation Expenses

The incorporation expenses are represented by the expenses planned during project construction, whether for advertisement promotion, licensing, project feasibility studies, expenses of legal advisors, registration fees, loan interests during construction or implementation or any extra losses resulting from project startup and operation, etc.

The cost of external financing during project construction and before starting of production is considered as an element for an investment cost, incorporation expenses unlike funding in normal operation of the project period. In addition to administrative and financial costs which is annually deducted from revenues before determining the net profit.

1.1.3 Working Capital

The working capital is an amount required to create an appropriate stockpile of production of various types, and an acceptable cash to meet other expenses, such as personnel wages, etc.

1.1.4 External Financing Cost during Project Establishment

One of the major sources for project financing. As long as such sources would charge amounts offered to the projects, which come into effect from the date of obtaining funds; therefore the cost, during project construction and before starting production, is included within the investment cost of the project items. However, this cost post the project carries on its activity, is considered one of the financing expenses.

Consequently, having completed all the aforementioned measures, any investment cost of any project can be estimated based on annual prices and feasibility conducted.
1.2 Operational Costs (Abdul Aziz Samir, 1994)

For the purpose of preparing a feasible study, the operating costs may be divided into the following groups:

- Operating expenses.
- General and administrative expenses.
- Financing expenses.

Operating expenses are considered to be the largest part among all project expenses. While raw materials and production requirements of various brands together with the employment may be considered as the largest among operating costs and should be estimated.

1.2.1 Estimating the cost of raw materials

The presence of raw materials should be determined first in domestic market through contacting sources of production and articulate raw supply, deadlines, supply conditions, supply prices, and place of delivery, etc.

In case the domestic market cannot provide all or some of such raw materials, they might be imported based on financial analysis obtained by other projects using same materials, or contact other suppliers to check prices and all other expenses ending to place of delivery.

1.2.2 Estimating the cost of production inputs

It can be reached through the following measures:

1. Restrict types of production inputs, and how much is needed to produce one unit item of each type.
2. Identify the requirements of a produced unit item of each type of production requirements to estimate and determine the overall percentage needed of such items annually.
3. Set prices to evaluate each item.

1.2.3 Estimate labour cost

The estimate labour cost can be reached through following measures:

1. Determine the type of labour needed by the project. The labour department can be divided into the following categories:
   - High management
   - Administrators
   - Skilled workers
   - Semi-skilled workers
   - Unskilled workers
2. Identify needs to each sector, administration, section, and category of employment groups for each year of the project, as the number of workers should be closely related to the size and development of each activity from one year to another.
3. Determine the annual remuneration for workers based on prevailing wage levels and taking into consideration laws and legislations governing these levels.
4. Determine the cost of social insurance and allowances of certain categories, bonuses, additional wages and other benefits,
5. Estimate the cost of labour, which is the most important items of operating costs, in total. It is worth mentioning that the operating cost requires preparing some detailed statements, particularly when the project consisting several sections each of which carries on a different activity.

1.3 Cash Flows

Items concerned with receipts and payments and related to cash movement regardless the realization principle. Accordingly, cash flow is often defined by financial analysts as a profit laced with consumption, it equals net cash resources of the institution throughout the year.

From a logical point of view, cash flow is the difference between cash receipts and cash payments of specific period. It also includes two components; cash outflows and cash inflows.

1.3.1 Cash Outflows (Zahruddin, Harmaizar, 2008)

Cash outflows are capital investment costs as an investment expense for the purposes of acquisition of capital assets to construct any investment project.

It is considered as a burden and obligations since of thinking of a project, starting of actual operation, performance of all production operation and activities of project functions. Any error in estimation to cash outflows is disadvantageous to the investor because it affects the return expected from any investment opportunity under study when carrying out the differentiation and assessment. It also reduces the effectiveness of cash inflows which cover the cost of capital investment. The process of estimating any cash outflow requires the following:

1. Estimate the investment expenses in fixed assets (lands, buildings, transportation, machinery, etc) along with all expenses of installation, shipping and insurance since contracting and purchasing the assets till possession.
2. Estimate the deferred receipts expenditures or so-called preliminary expenses, which are all capital expenditures spent during project construction up to actual operation phase.

3. Estimate the working capital or the minimum current assets required for the production cycle.

4. Long-term interests as a reliable financial source of the investment during construction period, if any.

5. Direct taxes on wealth or incomes are a cash outflow item to be included within the net cash flows. It is worth mentioning that there are limitations must be considered when estimating cash outflows and are as follows:
   a) The cash outflow is annually accounted to determine the share of each year of construction costs as a single unit with the assumption that they have spent at zero, i.e. hour start actual operations; therefore it is seen as the overall amount.
   b) The investment value of the project at the end of its chronological (economic and productive) age as a residual value. Such value has two choices:
      i. Discounting the value of the cash outflows after calculating the current value, at current value equal to the last proportion of the productive life of the project.
      ii. This value is considered as a cash inflow, and it treated like a capital in the last year of life of the project.
   c) If long-term loans are used to finance the project in the construction period, the repayment of loan principal is not considered a cash outflow, added to the total investment costs, such interests may be added to reach the total investment costs in the construction period; therefore they are considered as an cash inflow when calculating the cash inflow, although it is a financial expense of a double-counting process.
   d) All additional cash outflows must be anticipated and considered as an investment expense. This process requires comparing sources of funding with the total investment costs whenever estimating cash out flows.

1.3.2 Cash Inflows

Cash inflows include proceeds or income of project operated subtracting cash operating costs which are paid in the revenue period and are calculated for each year during the economic life of the project separately.

Cash inflows are most important components of net cash flow, they are determined by shape and pattern according to the objective as follows:

1. The cash inflow is represented in the expansion, replacement and renewal project as follows:
   a) The actual amount of investment return post covering investment costs.
   b) The amount of decrease in operating costs and production, or the amount of the increase in the output of production and production capacity.

2. Cash inflow is determined by net profit on sales in external and domestic market, if the purpose of investment targets producing a new product or creating a new line of production.

3. Cash inflow is indicated by the difference between cost of purchase and cost of manufacturing machinery parts, if the purpose of investment targets comparison between machinery parts and manufacture in facility.

4. All premiums paid for renting machines are considered part of cash inflow when comparing between purchase and leasing machineries.

Cash inflows include the following items:

a) Current Annual Revenue

Any anticipated value for project annual sales during project useful life. Whenever calculating cash flows out of sales of goods and services, the significance will be in actual value of sales outcomes. Therefore, all amounts collected in advance, will be treated as cash inflows in year of revenue.

b) Value of working capital at end of expected useful life of a project

Any value of inventory of raw materials, production requirements, spares parts, etc.

c) Value of remaining assets

Any value of depreciable and non-depreciable assets at end of expected useful life of a project; after indicating all items of cash inflows and cash outflows during years of construction and operation of the proposed project. The annual cash flow is calculated through the following equation.

(Mohammed Quadri, 1996-1997).

Net annual cash flow = cash inflow - cash outflow

So,

- If the cash inflows are greater than the cash outflows, the value of the equation "net cash flow" will be positive.
If the cash inflows are smaller than the cash outflows, the net cash flow will be negative.

In terms of the structure of financing, the investment needs of any project are met with various sources of financing by laying out the proper perception and determining the size of capital and loans.


Among the most important financial objectives of the study is to ensure the success of the project commercially, i.e. to what extent will the project achieve a sufficient return to stakeholders. There is a set of financial instrument that can be used to determine whether the investment return earned by stakeholders is sufficient or not. Some instruments are only appropriate for a particular project while others are suitable for multiple projects. However, some instruments seem appropriate only for a particular project which operates under certainty, or may be for a project which operates under uncertainty.

The main instruments used in commercial study of projects include:

- The payback period
- Net present value la valeuractuellenette –VAN
- Cost - benefit analysis
- Investment revenue or.rruter fo etar egarevA
- Rate of return and income
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1.5 Projects national Profitability (Public Private Partnership (PPP cell, 2016))

Economy projects can be measured based on the following pivots:

1.5.1 Annual Output of Foreign Exchange for Project Operation

It requires calculation of project expenses of foreign exchange, taking into account the consequences of construction indicated by revenues from exchange earnings due to exporting, foreign exchange surplus or stop importing goods produced by the project. It is good to have one table to include all the needs, surplus and revenues to be scheduled based on dates of appearance. Consequently, this may help to plan measures of project needs out of its resources from foreign exchange.

Project needs of foreign exchange are estimated from the reality of document information in technical study with its various details. While resources and surplus anticipated are identified by reality of document information in market study and estimating marketing opportunity with all relevant incomes and returns.

1.5.2 Estimating Social Profitability for a Project (Society Profit)

It requires a feasibility study to calculate the annual net return of society by preparing a statement of receipts and expenses to determine the accounting profit after making certain amendments on net revenue achieved by a community when constructing a project or bearing an additional burden due to project construction. Such amendments could be by addition or omission.

So, if part of project revenues are in foreign exchange, and the official price is higher than market price, it means that this part of revenue may worth less than its true value. Therefore, an amount equal to the difference between par value of foreign exchange and current value in the market should be added to project revenue. Showing a real income of a project in a community may require reduce in revenues appeared while calculating an accounting profit, in case of prices calculated on revenue basis were higher than alternative prices that can be recovered or imported before project implementation.

With respect to expenses, some additions may take place to amend the cost of imported supplies if only calculated on the basis of official exchange so as to show the real price in foreign currency then being imported. While other expenses that considered part of the annual costs, such as taxes, customs duties, production fees, and all other amounts charged by the state are to be excluded as they are not costs but an income to the society. Some expense items might have cuts, such as fuel and land lease if it had been calculated in market prices at a time when the price was equaled to zero prior to project construction to ensure the accuracy of estimating the real profit to society.

II. METHODOLOGY STEPS FOR ASSESSING FINANCIAL FEASIBILITY (Abu Jamie Naseem. and Mohammed Migdad, 2016)

The assessment of the financial feasibility relies on methodology and foundations, which is considered as pillars that show the extent of the validity of the proposed project. Studying such methodology represents a significant branch of feasibility studies as well as labor management so as to take the decision whether to accept or reject of the project financially.
2.1 Preparation of General and Administrative Expenses Plan

It includes preparation of a plan with all other expenses that do neither fall under sales and distribution expenses shown by sales plan consequent to market analysis, nor under production expenses shown by manufacturing plan consequent to technical analysis and achieved by plant operation, i.e., any general and administrative expenses, such as salaries of administrative, publications, taxes, insurance, and researches, etc.

2.2 Estimation of Total Project Costs

It includes the estimate of an overall cost of a project by collecting information of sales plan, manufacturing plan, and general and administrative expenses plan so as to determine the cost required to start the project.

The total capital expenditure for any project may consist of:

- Fixed investment such as cost of lands, buildings, equipment and machinery.
- Overall working capital, current assets required such as cash, inventories, accounts receivable, errands and prepaid expenses like rent, insurance, water, etc.

At this stage, there must be "project cost summary", which is the basis of any financial planning, as it is directed to potential financing parties before making funding request.

2.3 Determination of Financial Requirements

It includes prepare a preliminary assessment of financial needs or requirements to be modified later on in advanced stage, after preparation of cash flows estimates. At this stage, the following items should be studies:

- The amount of money obtained from external funding sources
- Funding required
- Sources of finance

2.4 Preparation of an Estimated Profit and Loss Statement

This step includes preparing estimates to income statement for the project, i.e., any estimates of machinery, profits, expenses, and losses, by using the following profit equation. (Aqeel Jassim Abdullah, PhD, Projects, 1999).

Profit after-tax profit = total sales - sales allowances - cost of sold merchandise - operating expenses + other income expenses - interests - income taxes.

Such estimates, especially those of new projects, should be calculated on monthly basis or an annual basis for the first year, and annual estimates for four more years.

2.5 Preparation of Cash Flow Estimates

This step includes preparing cash budget forecasts to help determine the monetary amount needed to start the project, and time needed to obtain loans layout, and make sure that the cash will be available to meet the liabilities.

Cash budget estimates include the following:

2.5.1 Cash Proceeds

All estimates of cash inflows from all cash sources, such as proceed receivables, cash sales, sale of property rights, etc.

2.5.2 Cash Payments

Cash estimates of payments like raw materials payments, labour payments, cash manufacturing costs, etc.

It is preferable to prepare estimates of cash flow on monthly basis during the phase precedes project operation, and on monthly basis and quarterly basis for the following years.

2.6 Preparation of Balance Sheet (Overton, Rodney, 2007)

To prepare resources statement in addition to share of ownership and personnel is significant for any project. It indicates the financial situation of any facility in a limited history to forecast what situation the facility will have after a certain period of time of operation.

It is quite often preferable to prepare estimates for balance sheet items for a period of five years at least after starting operation and prepare these estimates on monthly basis for the first year of operation.

2.7 Project Feasibility Assessment (Abu Jamie Naseem and Mohammed Migdad, 2016)

It involves a project feasibility assessment in light of collected data of technical analysis proposed, market analysis and financial analysis, through project analysis to determine whether the project is accepted or rejected by analyzing estimates of operation conditions and finally through sensitivity analysis and risk analysis by studying the impact of change in key variables (revenues and costs) on the final costs (profits) as well as studying all expected values of alternatives and select accordingly.
2.8 Determine Whether the Project Meets the Investment Criteria (Public Private Partnership (PPP cell), 2016)

Up to this stage of a feasibility study, the study is focused on "one project" but it is known that in order to assess any project objectively, there must be some other alternatives comparable to this project, for example, project subject to the study might be constructing a new plant for the production of a particular commodity, while the alternative might be the expansion of the current plant for the production of such item. In this case, proposals for investment expenses are arranged to choose the best investment proposal, in light of the criteria of an investment decision.

There are several methods used to arrange investment expenses proposals, some of which do not take into account the time value of money, such as method of degree of necessity, the average rate of return method, the method of recovery period, and others take into account the time value of money, such as method of net present value, the method of internal rate of return, and profitability style guide. The last sets of methods are preferred, in fact, from the viewpoint of proper financial assessment.

2.9 Forecasts Analysis of Operating Conditions

If we assume that we have taken a decision to accept the project based on defined investment criteria, the next step will be to shed light on the operational aspects of the project, especially if the project is establishing a factory for the production of a particular commodity, and this is done by analyzing estimated statements of income, balance sheet and cash flow.

The instruments that can be used in this analysis are financial ratios, liquidity ratios, activity ratios, profitability ratios, where such percentages are calculated (on a discretionary basis), then compared with industry rates, or facility-based ratios to identify the aspects, such as estimated competitiveness and liquidity position of the project, etc.

It also can be used for cash flow analysis method to identify whether the project will meet a problem of liquidity, or it will be able to cover current obligations in terms of their maturity dates.

2.10 Sensitivity Analysis (Abdul Aziz Samir, 1994)

Confirming safety of investment expenses decision may require conducting sensitive analysis. The sensitivity analysis includes determination of the impact of any potential changes in key variables, i.e. item prices, cost of raw materials, or operating cost on the overall outcome of the project (profitability or total costs) and to identify variables that have an impact on the project results.

In short, sensitivity analysis aims at determining the sensitivity taking into account all changes (internal or external) that occur in future, such as, reduction in prices, rise in prices of raw materials, etc.

Sensitivity analysis may use one of the following methods:

2.10.1 Break-even Analysis (Abu Jamie, 2015)

This analysis is used to show the impact of changes in cost, size of production and prices on profits, and determine the margin of safety with respect to variables like cost, production, and price, which allows the facility to continue operations.

2.10.2 Discounted Cash Flow Models

This analysis is used to show the impact of changes occurred in the discount rate on the net present value of project profitability.

2.11 Risk Analysis (Abu Jamie, 2014)

As a result of all variables used to determine project profitability depend on future events and cannot be predicted precisely; therefore it is highly required to get more accurate results with respect to project profitability and make risk analysis, where any risk associated with the investment project is considered and taken into account. The risk analysis should be expressed on a quantitative basis (probabilities) and used within scale when providing project results.

In such analysis, several decisions scenarios and possibilities for each scenario are determined while studying the project. Bayes’ theorem is usually used to reach expected value of various alternatives used as selected criterion.

2.12 Decision to Accept or Reject a Project Financially (Abu Jamie Naseem and Mohammed Migdad, 2016)

In light of data and information of financial analysis, the analysis may stop at some point when the project shows no progress such as the project may be inappropriate financially, in other words if financial returns and risks are not suitable for all parties investing in the project.

On the other hand, if the project is appropriate financially and suitable in terms of financial returns or risks for all investing parties, then it will be accepted financially.

Moreover, if the government is in charge of financial feasibility, planning, and investment, the decision will
continue the feasibility analysis of the project by moving to final stage of feasibility analysis, i.e, social and national profitability. Yet if a businessman is in charge, then the decision here will be definitely accepting the project. At this point, the project will move to its final stage, i.e, the stage of preparing an investment report to include all data accessed during analysis phases (logistic, technical and financial) along with results and recommendations.

The figure below shows the successive relations of alternative steps and decisions.

![Figure 1: Performing risk analysis](image)

1Dr. Samir Mohammed Abdul Aziz, Economic Feasibility Studies and Projects Assessment, Shihab University Institute, 1994, p 240.

Steps followed to evaluate the financial viability are considered as the foundations and criteria to be taken into account, which is necessary for any investment decision, particularly which relates to the financial aspects of the project. Thus, the effectiveness of any project related to the safety assessment of methodology selection of appropriate standards for evaluation process.

### III. CONCLUDING REMARKS

The main purpose of any financial feasibility study for any investment opportunities is to have and understand the financial impact by estimating precisely the size of the necessary financing to implement and operate a project.

The literature review also identifies different sources of financing along with its costs. Finally, it is a differentiation between the proposed financing structures and selecting the most suitable procedure.

The financial study, analyst faces by sum of data and information required to formulate and analysis, in order to judge the extent of profitability of an investment project through following aspects:
- The liquidity of the project and how internal cash structure matches the cash outflows.
- The adequacy of the capital structure.

REFERENCES


Citation of this Article: