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CASH FLOWS OF INVESTMENT PROJECTS – A MANAGERIAL APPROACH

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Abstract

In the context of present day economy characterized by continuous change, enterprises are forced to make a series of modernizations in order to improve technology, to access various market niches, to satisfy clients' demands. Consequently, enterprises invest annually substantial financial capital in fixed assets. These investments influence the situation of a firm over many years. A good decision may lead to a tremendous rise in profit and, as a consequence, to an increase in share price on the market. However, a bad decision may lead to bankruptcy. Thus, making decisions in the process of budget allocation, cost control and realist forecasting is vital for the future of an enterprise. Establishing investment budgets implies engaging funds in projects that will determine generating and increasing cash flow, estimated over a longer period of time. The essence of a good process of establishing a budget is to estimate correctly the cash inflows generated by the project.

Thus, the present paper analyses the basic principles of deciding on investment budgets, the modalities of estimating cash flows, making decisions for development and making decisions for replacement within investment processes.

1. INTRODUCTION

At least as important as a company's profitability is its liquidity - whether or not it is taking in enough money to meet its obligations. Companies, after all, go bankrupt because they cannot pay their bills, not because they are unprofitable. Now, that is an obvious point. Even so, many investors routinely ignore it. How? By looking only at a firm's income statement and not the cash flow statement.

Thus, the cash flow of a firm over a certain period of time is often used for appreciating both the efficiency of a business and the efficiency of investments. It is preferred over other result indicators (operating profit, current profit, self-financing capacity), especially due to the fact that it measures both potential results and available results, that is, which are supported by cash flow and allow the redistribution of participants in the firm's activities.

If you believe in the old adage, "it takes money to make money," then you can grasp the essence of cash flow and what it means to a company. The statement of cash flows reveals how a company spends its money (cash outflows) and where the money comes from (cash inflows). We know that a company's profitability, as shown by its net income , is an important investment evaluator. It would be nice to be able to think of this net income figure as a quick and easy way to judge a company's overall performance. However, although accrual accounting provides a basis for matching revenues and expenses, this system does not actually reflect the amount the company has received from the profits illustrated in this system. This can be a vital distinction. In this article, we'll explain what the cash flow statement can tell you and show you where to look to find this information.

2. SIGNIFICANCE OF INVESTMENT BUDGETS IN THE DECISION-MAKING PROCESS

As a firm grows and develops, its capacity to remain competitive and survive depends on the capacity to generate constant fluxes of ideas for new products and for new modalities to improve existing products, or to produce them at lower costs. As a consequence, a firm with good management will make substantial efforts to generate good project suggestions for investment budgets.

Investment projects that are taken into consideration by decisional management when establishing investments budgets *are created* by the firm and do not take the form of a set of assets on the securities market. For example, the sales personnel may report the fact that, on the market, clients ask for a certain type of product that the firm does not produce yet. The sales department manager discusses this idea with a research group in the marketing department in order to determine the market share for the suggested product. If, after conducting the research, there is a significant market, the cost-control personnel and the technical personnel are consulted in order to estimate production costs. If it is clear that the product is feasible and easy to sell so that sufficient profit is made, the project will be implemented.

Therefore, the next stage in the decision making process in a firm is represented by establishing the necessary investment capital. However, we must make a clear distinction between **capital** and **budget**: the term capital is used here to refer to fixed assets used in production, whereas the term budget signifies a plan that specifies in detail cash inflows and outflows over a future period of time. As a result, capital budget or investment budget of a firm comprises planned expenditure on fixed assets and establishing investment budgets or allocating capital is the entire process of analyzing projects and making decisions about choosing projects that are worth to be included in the investment budget. Obvious examples of capital expenditure are those for purchasing real estate, buildings and equipment, as well as those for permanent additional working capital when the production capacity expands. Advertising and promotion costs as well as research and development costs are seen as capital expenditure. The process of establishing investment budgets (capital allocation) has great significance for the success or failure of the firm, as decisions made regarding investment budgets, probably more than anything else, influence decisively the firm's future.

Nevertheless, there is a series of factors whose combination has a significant importance on the decision-making investment

process:

∗ to determine pertinent, relevant and correct information which is necessary when applying techniques to establish investment budgets, which implies a thorough analysis of costs and estimated benefits within the projects that are analyzed on the level of all departments – production, marketing and all the others;

∗ to estimate efficiently the necessary fixed assets: an incorrect estimate may have serious consequences: if the firm has invested heavily in fixed assets it is faced with high spending, that are not really necessary. On the other hand, if the firm has invested insufficiently, there may be serious problems, such as: the equipment available is not modern enough for competitive production or production capacity is inefficient. This determines the loss of market share to completion and regaining clients may imply higher selling expenses, price cuts and product improvement which is also costly;

∗ to estimate correctly investment planning: assets must be purchased when they are needed – if assets are purchased earlier than necessary this may determine inefficient intangible capital, and in case the firm does not have fixed assets in due time, it may refuse important orders and, thus, it does not obtain a higher turnover. That is the reason why it is necessary to estimate correctly the market demand.

Thus, efficient determination of investment budgets may improve both planning of assets purchasing and quality of purchased assets. A firm that estimates correctly the necessary assets has the possibility to purchase and install them before turnover exceeds production capacity. Practically, however, many firms do not develop before they reach maximum capacity. If sales figures rise because of a general market growth, then all the firms in the respective economic sector will have the tendency to order assets approximately at the same time. As a result, there will be unfulfilled orders, longer delivery periods of equipment, deterioration of quality of the ordered goods and price rises. The firm that foresees its necessities and purchases assets in time may avoid such problems. We have to remark, however, that, if a firm estimates increasing demand and expands capacity to respond promptly to these estimations, which do not materialize, then the firm has excess capacity and unusual high costs. This may lead to significant losses or even bankruptcy. Thus, estimation is the critical point.

After generating ideas, first step in establishing investments budgets is a list with all the suggested projects together with necessary data to be analyzed. Analyzing proposal for capital expenditure is not a free operation – there may be benefits after a careful analysis, which implies some costs. For some projects, a rather comprehensive analysis must be done, for others the studies cost-benefits may lead to a simpler procedure. Consequently, firms distinguish the following categories of projects and then apply different analysis modalities:

- replacement projects: maintaining the business level;
- replacement projects: cost reductions;
- expanding existing products or markets;
- expanding new products or markets;
- projects protect the environment;
- others.

Finally, establishing investment budgets is important because expansion, development of a firm implies substantial expenses which determine the elaboration and adoption of adequate financing plans years before, in order to ensure it has the necessary funds.

3. ESTIMATING CASH FLOW OF INVESTMENT PROJECTS

The most important stage and the most difficult, at the same time, in the analysis of a investment budget project is *estimating* **its cash flows** – investment expenses and expected annual cash inflows after the investment is put into operation. Initial costs and expected cash flows are *directly related* to project acceptance.

When estimating cash flows there are many variables, and in this process many people and departments are involved. For example, forecasting sales in product units and selling prices belong to the marketing group, based on their knowledge of price elasticity, advertising effect, economy, possible reactions from competition and consumer trends. Similarly, capital expenses associated with a

new product are generally obtained by engineers and research team, human resources specialists, supply agents and so forth.

An important element in estimating cash flows is identification of *relevant* cash flows which are represented by the group of cash flows taken into consideration when making a decision. There are two rules for financial analysts to avoid mistakes:

(1)decisions which are the base for establishing investment budgets must start from cash flows and not from the net accounting level

(2)only discrete cash flows (incremental) – those that are generates by accepting the project – are relevant in making a decision to accept or reject the project

These two rules are discussed as follows.

When analyzing investment budgets, annual cash flows are used instead of registered income. Cash flows may be different from registered profit. When measuring cash flows, two problems must be solved:

→ Is the registered income in accordance with accounting requirements and income?

→ How are cash flows actually calculated?

Table 1 deals with the former problem. The profit and loss account of the firm, as it is registered in financial records, is in column 2. Column 3 presents the profit and loss account based on the taxes that have to be paid. This reflects the actual consequences of firm operations on cash, after taxes. Thus, we notice that taxes that have to be paid by the firm amount to 2.400 lei. According to those reported to shareholders the amount of 4.000 lei registered for taxation represents taxes of 2.400 lei payable in the current period plus the amount of 1.600 lei, which represents deferred taxes.

Table 1 Profit and loss account

	Profit and loss account reported to shareholders	Profit and loss account reported for tax purposes
1	2	3
Turnover	155.000	155.000
Operating costs	(110.000)	(110.000)
Income from operations, before amortization, interests and taxes	45.000	45.000
Depreciation and amortization		
According to accounting rules	(15.000)	
According to capital cost allowance		(25.000)
Net income from operations	30.000	20.000
Interest expenses	5.000	5.000
Income before taxes	25.000	15.000
Taxes (16%)	4.000	2.400
Net income	21.000	12.600

Estimated net cash flow or estimated future income from an investment must reflect the consequences on the firm of the available cash amount after taxes. So, the relevant financial document is the one used for fiscal purposes. In any investment project taxes which are used in calculating cash flows are those actually paid according to the cost of capital allocation and not to taxes that are paid when the amortization expense is applied in the balance sheet.

The second problem is the actual calculation of net cash flow. This calculation starts from the profit and loss account in the second column of table 1, is presented in table 2 – because net cash flows are used to pay used financing sources and there is no deduction[1].

[1] In fact, net cash flows should be adjusted to reflect all non-cash expenses, not only the expense with capital allocation cost. However, for most of the firms, the most important non-cash expense is the amortization expense. Moreover, in table 2 there is no decrease in interest expenses which would appear in case the firm uses credit financing. Most of the firms that use credit consequently finance part of their capital budget from credits. Thus, there is the question if interest expenses should be reflected or not in the analysis of cash flow for capital budgets. It is generally agreed that interest expenses are not introduced explicitly in establishing capital budgets because the effects of credit financing are reflected in the cost of capital rate used to update capital flows.

Table 2 Calculating cash flow

1	2	3
Turnover	155.000	155.000
Operating costs	(110.000)	(110.000)
Income from operations, before amortization, interests and taxes	45.000	45.000
Capital cost allowance expenses	(25.000)	-
Net income from operations	20.000	45.000
Taxes (16%)	(3.200)	(3.200)
Net income from operations after taxes	16.800	41.800
Capital cost allowance expenses	25.000	-
Net cash flow	41.800	41.800

In column 2, net cash flow is equal to net income from operation after taxes, that is, 16.800 lei plus amortization. These are added together as there is no consequence on cash flow, other than its impact on taxable income. In column 3, net cash flow is calculated directly as income from operation before taxes, 45.000 lei minus taxes actually paid, an amount of 3.200 lei.

In other words, net cash flow after taxes may be expressed as follows:

$$\text{Net cash flow after taxes} = \text{Net income from operations after taxes} + \text{Amortization} = \quad (1)$$

=	[Turnover – Operating expenses (including amortization)] (1-T)	+	Amortization

where T is the marginal corporate tax rate that applies to the firm. For the example in the table, the net operating flow after tax equals:

(155.000 – 135.000)(1-0,16) + 25.000 = 41.800

Thus, net cash flow after taxes should represent the consequences in cash of the firm's activities over a certain period, including any new investment made. So, the general expression for net cash flow after taxes is:

Net cash flow after taxes	Net operating income (1-T)	capital cost allowance	New investment,	

where net operating income includes amortization expenses[2].

Apart from calculating net cash flow after taxes for a firm, when evaluating an investment project it is important to determine only those cash flows that result directly from that investment. These cash flows are called **incremental** cash flows and represent modifications in the total cash flows of a firm that have as a direct result acceptance or denial of an investment project.

Incremental cash flow is the additional operating cash flow that an organization receives from taking on a new project. A positive incremental cash flow means that the company's cash flow will increase with the acceptance of the project. There are several components that must be identified when looking at incremental cash flows: the initial outlay, cash flows from taking on the project, terminal cost (or value) and the scale and timing of the project. A positive incremental cash flow is a good indication that an organization should spend some time and money investing in the project.

When determining incremental cash flows from a new project, several problems arise: sunk costs, opportunity costs, externalities, transport and installation costs and residual value (for scrapping):

- Sunk Costs - these are the initial outlays required to analyze a project that cannot be recovered even if a project is accepted. As such, these costs will not affect the future cash flows of the project and should not be considered when making capital-budgeting decisions.
- Opportunity Cost - this is the cost of not going forward with a project or the cash outflows that will not be earned as a result of utilizing an asset for another alternative.
- Externality - in the consideration of incremental cash flows of a new project, there may be effects on the existing operations of the company to consider, known as "externalities."
- Transport and installation costs – when a firm purchases fixed assets, it often has to cover transport

Net cash flow after taxes	(Operating income) (1-T)		T (Amortization)		=			
Net cash flow after taxes	(45.000 lei) (1-0,16)		0.16 (25.000)		41.800			(2)

An equivalent formula of cash flow after tax is obtained by taking into consideration the operating income which does not reflect non-cash expenses. Thus, the calculation modality is formulated as follows:

[2] More frequently we observe that firms add to gross value of fixed assets a value that every year is equal to amortization in order to maintain asset earning power. If investment equals capital cost allowance amortization expenses registered for fiscal purposes, then investment in new assets cancels the decrease of the asset value with the deducted sum for amortization. The net cash flow after taxes would be, in this case, equal with Net operating income (1-T). In our example, the net cash flow after taxes would be 20.000. If we suppose that the new investment equals the registered amortization in the profit and loss account, then the net cash flow after taxes can be written as:

Net cash flow after taxes = Net operating income (1-T) + Capital cost allowance - Amortization

and installation costs which are quite substantial. These expenses are added to the invoice that contains the price of equipment when the project cost is determined.

- Residual value – is the value that an asset has at the end of a specific period of time. This value is important in the analysis of investment budgets, for two reasons: first, an asset that is purchased at present will be sold after some years for a certain amount of money that has to be forecast; secondly, if the asset taken into consideration is a replacement of an older one, it is possible that the firm plans to sell the older one. In this case residual value of the old asset represents the market value at present.

4. CAPITAL RATIONING

Investment budgets are accepted, generally, if their values are positive in case of independent projects; in case of projects that exclude each other, the one that has the highest net value is selected. If the firm has many good projects in one year, the managerial team appeals to financial markets in order to raise capital to finance all accepted projects. At the same time, there are fund limits that are established. In such a case, investment budget must also be limited. This situation is known as capital rationing.

Managers could be or not interested in being engaged in an external fund financing, for various reasons. Some want to avoid any risk (a higher degree of risk intolerance), and simply refuse to issue credit instruments. Others agree with issuing and selling financial instruments of credit but do not want to issue or sell shares, being afraid to lose control over the company, at a certain extent. Others refuse to use any external financing because they consider that safety and control possibility are more important than extra profit. Finally, some know the limited experience of their firm as far as managerial ability is concerned or limited human resources and that is why they prefer that the investment budget should be limited to a number of projects that can be controlled by the managerial team.

Capital rationing leads to a limitation of the growth rate, to a lower rhythm than that dictated by rational reasons related to maximizing firm value. It is important to acknowledge the fact that capital rationing could be a short-term problem. If the managerial team of a firm decides to limit investment budgets and thus, does not accept profitable projects, the firm becomes the target for a takeover by another firm or the managerial team will be confronted with opposition from shareholders in the General Meeting. From the point of view of the competition, competitors do not act similarly because such a measure will offer competitive advantage.

5. CONCLUSIONS

In the present economic environment, firms are frequently faced with the decision to develop or to improve their activity or products continuously in order to create competitive advantage on the market and finally to maximize value.

The investment decision raises a series of issues that managers face when establishing investment budgets: estimating cash flows, expansion decisions and replacement decisions. Thus, from what we have presented there are some main conclusions:

→ the most important and the most difficult stage in analyzing capital budget is estimating incremental increase in cash flow after taxes, which will be a consequence of the project;

→ net cash flow for investment projects are formed of income from sales without operating costs, minus taxes plus cash flows based on payable CCA, which equals the payable CCA value multiplied with the taxation rate applied to the firm;

→ in determining incremental increases in cash flow, opportunity costs should be included (the profit that can be obtained by investing in another project with the same risk), but unrecoverable costs should not be included (cash expenses that were made and cannot be recovered). Any type of externality (that is effects that the investment project could have on other parts of the firm) must be included in the analysis;

→ capital rationing takes place when the managerial team places

investment budget under constraints on a certain time period. A selection of projects can be made in case of capital rationing, by classifying projects according to the report VAN/investment cost and by selecting a project group that has positive net values and that uses entirely the limited capital budget.

Due to the fact that it is difficult to estimate exactly the costs and incomes for a larger and more complex investment project, estimation errors may be quite important (for example, errors regarding estimating production costs, errors of estimated costs with large buildings etc). Moreover, although costs of production unit construction and costs of purchasing equipment are difficult to estimate correctly, income from sales and operating costs for the entire lifespan of the project generally have a higher degree of uncertainty. The degree of uncertainty is higher if estimating cash flows is done a more distant point in time. However, if estimating cash flow has no reasonable degree of accuracy, any analytical technique, regardless of its complexity degree may lead to wrong decisions and to operating losses and a reduction of the share price on the market. This does not mean that firms are not allowed to make estimation errors, only that estimation of cash flows should be the best, if possible, for the moment when the project is evaluated.

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