

Modernization of the Company's Fixed Assets: Critical Factors that Affect the Capital Budgeting Decisions

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Abstract: Modernization of the company's fixed assets is a necessary condition for its development and competitiveness. Assessing projects and efficient allocation of the capital depend on the project requirements. The identification of the critical factors makes it possible to compile a realistic investment budget of the company. It also contributes to the optimal solution of the problem of modernization of fixed assets. The capital investment decision of project ranking plays a crucial role in capital investment decisions. The business concerns prioritize the various projects on the base of the kind of project a firm has at a particular point of time. Project ranking is dependent on the fact as to how much would a particular project return as well as which project has the ability to provide the business, a maximum value. The development of recommendations to improve the company's policies of modernization of fixed assets under the investment budget project makes the right accents for the targeted usage of funds.

Keywords: Budget decisions, capital investment projects, fixed assets, project valuation, capital budgeting techniques, facility management.

1. INTRODUCTION

In the financial management, the efficient allocation of the capital is one of the most important functions. It involves the decisions to commit the firm's funds to the long-term assets. The investment decisions of the firm are generally known as capital budgeting, or capital expenditure decisions.

Questions of the issues associated with the theory and practice of budgeting were reflected in works of many authors. Among Russian economists, the following can be distinguished: N. Ermasova, V. Kozelskiy, V. Inozemtsev, V. Sabancieva etc. In foreign countries, the specific issues of budgeting were worked out at different times by B. Lynch, R. Jarrow, G. M. Phillips, G.P. Ryan, G. Schneider etc.

As shown in the Figure 1, capital budgeting decisions have a major effect on the value of the firm and its shareholder wealth. Capital budgeting is the process of examining, accepting and rejecting alternative capital projects considering the most profitable return on available funds, within the framework of company goals and objectives. A capital project is considered as any available alternative to purchase, build, lease, or renovate buildings, equipment, or other long-range major items of property.

2. CLASSIFICATION OF CAPITAL INVESTMENTS

Depending on the object of investment, all capital investments are divided into productive and non-productive. The first group includes investments in the construction of buildings and structures, in machinery and equipment, in increasing the stock of raw materials. The second group includes investments in social and cultural objects, urban infrastructure, libraries, children's institutions, etc.

The elements of the investments are divided by material and non-material. All costs for the construction and reconstruction of buildings, the purchase of machinery, equipment (in other words, assets that have material content) are included in tangible investments. Investments in intellectual property assets (that do not have material content like property rights, patents, licenses, software, technologies, know-how) are related to intangible investments.

Depending on the type of reproduction, capital investments are associated with intensive development (new construction and expansion of existing enterprises) and with extensive (new construction and expansion of existing enterprises). This division is rather conditional since it is impossible to carry out new construction without considering the latest achievements of science and technology.

According to the sources of financing, there are investments made at own expense, and attracted, for example with borrowed funds.

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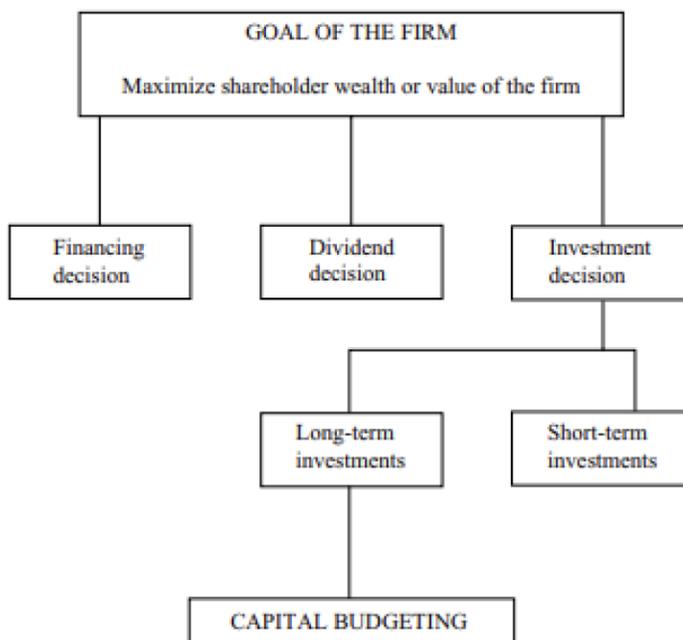


Figure 1: Corporate goal, financial management and capital budgeting.

Source: Real Options Analysis and the Assumptions of Corporate Finance: A Non-Technical Review. Arnold Tom, and Richard L. Shockley.

By the degree of centralization of capital investments are divided into state (at the expense of the state budget and the budgets of the subjects of the Federation, as well as ministries and departments) and decentralized (at the expense of enterprises). By origin, investments are divided into domestic and foreign.

All investment projects are classified into three categories - independent projects, mutually exclusive projects and contingent projects. The basis of this classification is their influence on the investment decision process. An independent project is one the acceptance or rejection of which does not directly affect the likelihood of the selection of other projects. Such projects can be evaluated independently. Thus, decision made to accept or reject them depending upon whether they add value to the firm. Mutually exclusive projects are investments that compete in some way for the company's resources. The firm can choose one or another but not both - the acceptance of one prevents the acceptance of an alternative proposal. A contingent project is one the acceptance or rejection of which is dependent on the decision to accept or reject one or more other projects. Contingent projects may be complementary or substitutes.

The selected projects usually involves large sums of money. Moreover, they bring a large increase in fixed costs for several years in the future. Once a company builds a plant or undertakes some other capital

expenditure, its future investment plans are less flexible. Capital budgeting decisions involve a current outlay or series of outlays of cash resources in return for an anticipated flow of future benefits. In other words, the system of capital budgeting is employed to evaluate expenditure decisions which involves current outlays but are likely to produce benefits over a period of time longer than one year. These benefits may be either in the form of increased revenue or reduced costs. Capital expenditure decisions, therefore, includes additions, disposition, modifications and replacement of fixed assets.

Special care should be taken in making these decisions because of the following reasons:

- Growth: - The effects of investment decisions in long term assets has a decisive influence on the rate and direction of its growth. A wrong decision can result in heavy operating costs to the firm and makes it difficult for the firm to compete on the market and maintain its market share.
- Risk: - Long term commitment of funds may affect the company's liquidity and even solvency if the company shows frequent fluctuations in its earnings.
- Funding: - Investment decisions generally involve large amount of funds. For this reason, it

Expansion	Replacement	Renewal
<ul style="list-style-type: none"> • Capital investment decisions are aimed at the expansion of operation levels. It's achieved through acquiring fixed assets by buying plant facilities and property, which ensure a good investment and capital investment balancing in turn. 	<ul style="list-style-type: none"> • Post the period of maturity, when the growth of a firm slows down, the firms; worn out or outdated assets need to be replaced, like machinery, vehicles, equipment, etc. Hence, an organization can turn back to its production full-fledgedly and yield the desired benefits. 	<ul style="list-style-type: none"> • As a substitute to replacing, renewal might involve rebuilding, retrofitting or overhauling an existent asset. This definitely increases the firms' profits and productions.

Figure 2: Main motives for the company's capital investment decisions.

Source: Application of the Capital Budgeting Techniques in the Decision Making Process of Croatian Banks. L Dedi, S Orsag, D Holjevac.

is crucial for the firm to plan all investments very carefully and make advance arrangement for procuring finances internally and externally.

- Irreversibility: - Most investment decisions are irreversible. As a result, the company will incur heavy losses if such assets are scrapped.
- Complexity: - Investment decisions are an evaluation of future events which are difficult to predict. It is really a complex problem to correctly estimate future cash flows of an investment because numerous external and internal factors.

The company's aim by making capital investment decisions is to maximize the wealth of the shareholder by acquiring assets and yielding profit. To achieve this goal, the company's management should make many steps starting with finding out and determining as to what projects of capital investment would yield a cash flow which is positive and when there are constrained resources.

3. THE CAPITAL BUDGETING PROCESS BY STEPS

The capital budgeting process has several stages in the process. For typical investment proposals, the first stage is strategic planning. A strategic plan clearly translates the firm's corporate goal into specific policies and directions. This step sets priorities, specifies the structural, strategic and tactical areas of business development. Moreover, this stage guides the planning process in the pursuit of solid objectives. There are feedback loops at different stages. For this reason, the feedback to 'strategic planning' at the project evaluation and decision stages is vital. This feedback may suggest changes to the future direction of the firm

which may cause changes to the firm's strategic plan. The identification of investment opportunities and generation of investment project proposals is an important step in the capital budgeting process. Project proposals should fit in with a firm's corporate goals. Also project proposals should reflect the company's vision, mission and long-term strategic plan.

A profitable investment proposal is an efficient combination of careful search and identified potentially lucrative investment opportunities. Some firms have research and development (R&D) divisions that constantly search for new products, services and processes and identify attractive investment opportunities. However, sometimes excellent investment suggestions come through informal processes such as employee chats during lunch time.

Despite numerous potential investment proposals generated daily, all opportunities must be carefully examined by management to isolate the unsound proposals. The stage of preliminary screening involves judgements based on intuitive feelings and experience and preliminary quantitative analysis.

After the preliminary screening phase, investment projects should ascertain their added value to the company. This stage is also called project evaluation, quantitative analysis, economic and financial appraisal, or simply project analysis. The analysts make prediction about possible risks, future cash flow of the potential project. At this stage it is essential to examine the company's sensitivity to the changes and develop alternative cash flow forecasts. Thus, the project analysis can involve the application of mathematical programming techniques such as linear programming.

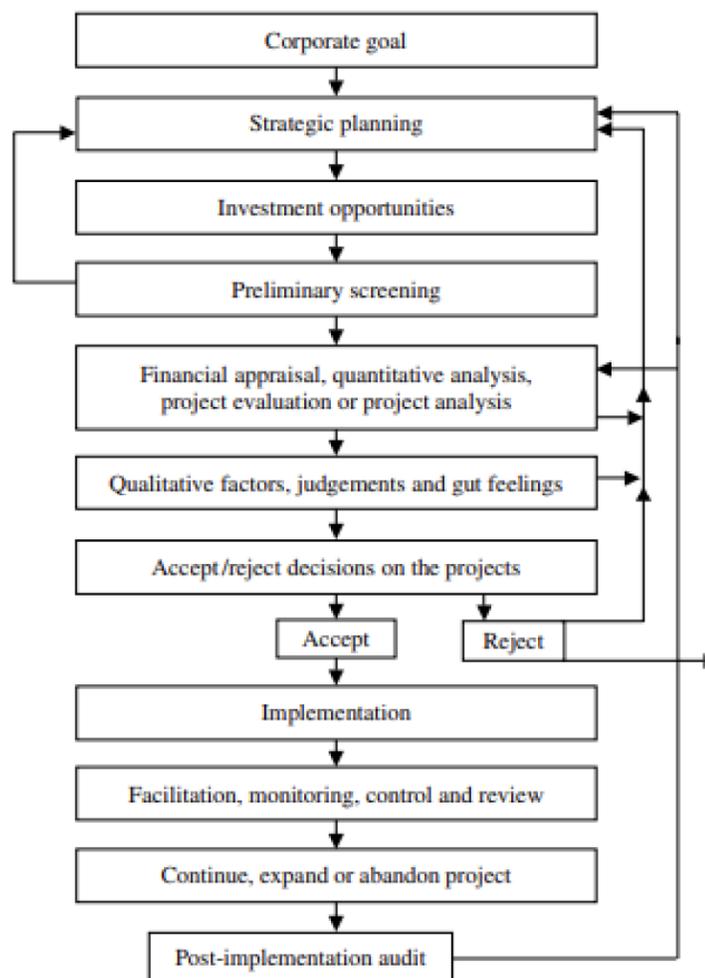


Figure 3: The capital budgeting process.

Source: Computing present values- Capital budgeting done correctly. Robert Jarrow.

Without any doubts, there are basic concepts, principles and techniques that are efficient for all types of projects. However, it should be taken into account that application of these principles to particular types of projects requires special knowledge and expertise. The results of the quantitative project analyses should not be underestimated as it directly affects the future success of the project.

After carrying out the quantitative analysis test, the project will be examined considering qualitative factors. Qualitative factors are those that are virtually impossible to evaluate accurately in monetary terms. They are factors such as political attitudes towards the project or positive or negative relationships with labor unions.

4. FACTORS AFFECTING THE EFFECTIVENESS OF CAPITAL INVESTMENTS

Without any doubts, the capital investment decisions aren't regularized by one or two factors. It

can be explained by the nature of the problem of investments – it does not just one of the problems of substituting old equipment with new one, but it's related to implementation of new procedures that makes the whole system better and much more effective.

All factors affecting the effectiveness of capital investments can be classified according to the scale of the impact:

- Factors affecting the efficiency of capital investments at the macro level;
- Factors affecting the effectiveness of capital investments at the regional level;
- Factors affecting the efficiency of capital investments at the enterprise level.

Factors affecting the efficiency of capital investments at the macro level include:

- the effectiveness of the state's economic and social policies;
- investment risk;
- perfection of the tax system;
- the level of inflation;
- political and social situation in the country;
- the Central Bank's refinancing rate and interest rate;
- investment attractiveness;
- perfection of normative base in the field of investment activity;
- degree of perfection of the investment infrastructure;
- created conditions for attracting foreign investments;
- the effectiveness of the investment policy pursued by the state.

Factors influencing the efficiency of capital investments at the regional level include:

- the effectiveness of economic and social policies;
- investment attractiveness of the region;
- created conditions for attracting foreign investments;
- improvement of the tax system at the regional level;
- the effectiveness of the regional investment policy;
- the degree of perfection of the regional investment infrastructure;
- level of investment risk, etc.

Factors affecting the efficiency of capital investments at the enterprise level include:

- the efficiency of the economic and social policy conducted by the enterprise;
- the existence of an effective investment policy;
- quality and competitiveness of the products;
- level of use of basic production assets and production capacities;

- the degree of rationality of the use of available resources in the enterprise;
- competence of enterprise managers and the degree of perfection of enterprise management;
- quality and efficiency of investment projects being implemented, etc.

5. METHODS FOR PROJECT EVALUATIONS

When evaluating investments, top managers can choose among many capital budgeting methods, some recommended in textbooks, others not. We distinguish twelve capital budgeting methods with their pros and cons:

1. Net present value (NPV). This method incorporates all cash-flows that the investment generates as well as the time value of money. The first step to making decisions based on the net present value is understanding the type of project to be evaluated. Independent projects, which are not affected by other projects' cash flows should be accepted if the net present value is greater than \$0. In the case of mutually exclusive projects represent projects, the project with the greater net present value should be accepted. If the net present value of both projects is negative, then both should be rejected. The great benefit of this method is that it provides a concrete number that managers can use to easily compare an initial outlay of cash against the present value of the return.
2. Internal rate of return (IRR). Internal rate of return is a discount rate that makes the net present value (NPV) of all cash flows from a project equal to zero. To calculate IRR, the analysts use the same formula as for NPV. IRR cannot be calculated analytically and must instead be calculated either through trial-and-error or using software programmed to calculate IRR. It can be explained by the nature of the formula. The higher a project's internal rate of return, the more desirable it is to undertake. This method can be used to rank multiple prospective projects on a relatively even basis. Assuming the costs of investment are equal among the various projects, the project with the highest IRR would probably be considered the best, and as a result, be undertaken first. Some analyst confirm that IRR can be misleading when a choice is made among mutually exclusive projects. The same

- "misleading" results can be obtained because of so-called multiple rates of return.
3. Annuity. The annuity method is also a variant of NPV. An annuity is a series of cash flows of equal amounts in each period of the total planning period. If there is information about the annuity of an investment, and how many years it should generate net cash-inflows or outflows, it is easy to calculate its NPV. It calculates by discounting the annuity with the relevant weighted average cost of capital. Absolute profitability is achieved if an investment project's annuity is greater than zero. An investment project is preferred if it has a higher annuity than the alternative investment projects. A limitation of this approach is that the annuity method is not suitable for the assessment of relative profitability.
 4. Earnings multiple (P/E). The earnings multiple or price/earnings (P/E) method calculates how many years it will take until the initial investment will be paid back by earnings. It is a variation on pay-back method. This method considers earnings instead of cash-flows and only considers one earnings figure (instead of many). The price-earnings ratio indicates the dollar amount an investor can expect to invest in a company in order to receive one dollar of that company's earnings. For this reason, this method is sometimes referred to as the price multiple because it shows how much investors are willing to pay per dollar of earnings. The drawback is that it does not take the time value of money into consideration.
 5. Adjusted present value (APV). The adjusted present value is the net present value (NPV) of a project or company if financed solely by equity plus the present value (PV) of any financing benefits, which are the additional effects of debt. By taking into account financing benefits, APV includes tax shields such as those provided by deductible interest. The adjusted present value (APV) method adds the value of any financial side-effects of an investment to NPV, and should in principle have no drawbacks.
 6. Pay-back. Pay-back methods are determined by counting the number of years it takes to recover the funds invested. It does not consider the time value of money. This method also ignores cash-flows that occur after the maximum pay-back time. However, some analysts favor the payback method for its simplicity.
 7. Discounted pay-back. A discounted payback period gives the number of years it takes to break even from undertaking the initial expenditure, by discounting future cash flows and recognizing the time value of money. Discounted pay-back does not ignore the time value of money, but still ignores cash-flows after the maximum pay-back point.
 8. Profitability index. Profitability index is also called cost-benefit ratio, benefit-cost ratio, or capital rationing. When the highest net present value per monetary unit of the initial outlay is calculated, a so-called profitability index has been established. This is known as the profitability index, which is calculated by dividing the initial investment by the current value of a project's future cash flows. If the profitability index is greater than 1.0, the profitability is positive and the project is likely a good investment. If it is less than 1.0, the proposed project will lose value. A profitability index equaling 1.0 indicates that the projects cash gains or losses will be minimal. A potential limitation is that, if applied carelessly and investment resources are constrained, it can give bad advice.
 9. Accounting rate of return (ARR). ARR is the average net income an asset is expected to generate divided by its average capital cost, expressed as an annual percentage. If the ARR is equal to 5%, this means that the project is expected to earn five cents for every dollar invested per year. In terms of decision making, if the ARR is equal to or greater than the required rate of return, the project is acceptable because the company will earn at least the required rate of return. The main disadvantage of ARR method is that it uses accounting numbers instead of cash-flows. Besides, this method does not consider the time value of money.
 10. Sensitivity analysis. The sensitivity analysis is based on the variables impacting valuation, which a financial model can describe using the variables' price and earnings per share. The sensitivity analysis isolates these variables and then records the range of possible outcomes.

This method is applied to see whether an investment will still be profitable if one or more variables are changed. It is also important to note that a sensitivity analysis is not the same as a scenario analysis. In principal, sensitivity analysis has no drawbacks.

11. Value-at-risk (VAR). Value at Risk (VAR) calculates the maximum loss expected (or worst-case scenario) on an investment, over a given time period and given a specified degree of confidence. A VAR statistic has three components: a time period, a confidence level and a loss amount (or loss percentage). There are three methods of calculating VAR: the historical method, the variance-covariance method and the Monte Carlo simulation. A disadvantage is that it does not estimate how bad the loss might be if market conditions turn abnormal.
12. Real options. Real options reasoning is based on logical financial options in the sense that those financial options create a certain amount of valuable flexibility. Various management choices to make investments can give companies real options to take additional actions in the future, based on existing market conditions. The reason why the management accept and realize many projects which look unprofitable at first glance is the possibility of making subsequent investments (conditioned on the current project). This is method with no obvious drawbacks. However, the precise value of real options can be difficult to establish or estimate.

Difficulties with the usual "text-book" methods of capital expenditure evaluation, e.g., internal rate of return or present value, arise when the independence assumption between projects does not hold. How strong this assumption is may be seen when one considers that alternative to almost every project is the possibility of its postponement for one or more periods, with concomitant changes in outlays and payoffs. These, of course, form a mutually-exclusive set of alternatives since it would be deemed uneconomical, if not impossible, to carry out more than one of them. Mutual exclusion is by no means the only alternative to independence, even though this is the only other possibility which is usually raised in the literature. Contingent or dependent projects can arise, for instance, when "acceptance of one proposal is dependent on acceptance of one or more other

proposals. In practice, however, this is likely to prove an undesirable way of handling them, for the number of compound projects may be very large.

All factors affecting the effectiveness of capital investments, depending on the time of their occurrence, can be delineated into temporary and permanently acting ones. The lack of comparability of unequal funds in different time periods is a serious drawback when the analysts use the simplest methods of calculating the effectiveness of capital investments. The time factor must be considered, since the one-time costs are carried out over the years for a number of years, and the current costs and final results of the economic activities of the industrial enterprise significantly change over the years of operation of the enterprise as a result of capital investments.

The implementation starts after the decision stage – acceptance or rejection of the project. It is vital to trace all implementation process to avoid any deviations from the estimated cash flows.

Post-implementation audit deals with a revision the performance of already implemented projects. An examination of past decisions can influence greatly to the improvement of current investment decision-making by analyzing the past errors and successes. Moreover, if already implemented projects do not prove to be as lucrative as predicted, such information can prompt management to consider a thorough review of the firm's current strategic plan.

6. CONCLUSIONS

One of the challenges is to find the balance between strategic planning and investment opportunities. On the one hand, some investments have mandatory character that can be explained some regulatory, health and safety requirements. On the other hand, investment project can occur because of opportunities for the company's growth or for cost reduction.

It is common when companies are ready to invest and absorb a new technology but due to external factors their investment activity is significantly reduced. In our opinion, the most important and commonly acknowledged external factors influencing are those that relate to macroeconomic prospects and monetary policy conducted in a country, which are manifested in expected gross domestic product growth and interest rates. Their role is so widespread that it might be

assumed that all companies are influenced by them in their investment decisions. Other important factors that strongly affect the investment possibilities are the liquidity and pattern of debt repayment observed among the companies in the economy. If companies suffer from delays in obtaining their receivables, then their costs are likely to incline and new investment projects might be to a large extent reduced. Then, investment actions are usually influenced by external decisions associated with the government performance. Among those, the most important are tax policy which directly influences the rate of return on investment. However, it has been shown that they are more important for large firms than for small ones and in the case of the latter they might be not even comprised in the investment decision process. Finally, the rate of return, though not explicitly, can be influenced by the performance of institutions in the country.

There might be many different criteria's for choosing the appropriate and right capital investment decision. Management carefully examines all available information using their routine information sources, experience, expertise and accept or reject the proposed investment project. The final decision should be achieved by pursuing the important aim - increasing the firms' value by taking on a good project at the perfect time.

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