Analytical Study of Application of Capital Budgeting Techniques in the Food Industrial of Mashhad Tous Industrial Units and to Identify existing bottlenecks

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As a result, most companies are facing with constraints. Therefore, we need analytical techniques in order to evaluation of plans. Thus, we used some analytical techniques in evaluation projects in industrial town of Mashhad. A survey was done so as to collect data and final study sample consisted of 52 companies during 2000 and 2010.to test e classification and obstacles Friedman test were used and also SPSS and EXCEL were used in order to test hypotheses and analyze data respectively. The results of the test indicate companies in industrial town of Mashhad used techniques like payback period method, profitability index, payback reciprocal, IRR, ROA and NPV. Moreover, this research showed that managers used traditional techniques like personal judgment.

Key word: Investment, Capital Budgeting, Industrial Town, Payback Period Method, NPV, IRR

Introduction
With the tremendous advances of technology in the field of improving the production of goods and services, Companies invest huge sums every year in machinery, utilities and Other productive assets. Allocation of funds to different investment is one of the tasks of financial managers in today's world which involve decisions for using company's funds in long-term assets. Since almost all economic units are faced with limited resources, Project evaluation of Long-term investments becomes important.

Making decision is one of the most important tasks of the managers in a business unit, and one of the most important financial decisions is capital budgeting decisions which lack of attention to that can involve financial resources of company in high risk and uncertain projects. These decisions according to their nature can influence on growth, profitability, risk, corporate and economic units value for many years. Appropriate decisions can increase profits; moreover, increase corporate value. In contrast, poor decisions can lead to the bankruptcy of the company.

Considering the importance of these decisions, financial managers must strive to evaluate These kinds of decisions more carefully [7].

Literature Review:

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and risks associated with the committed fund for a long term project.

The basic assumption in capital budgeting in financial management is:
A) The first task of the manager is increasing the company's value that its reflection on the price of the common stock will be shown.
B) Owners would prefer current cash flow to future cash flow
C) Shareholders are fleeing the risk.
D) In evaluating capital budgeting projects, analysis is done base on incremental cash flow of project.
E) Since investment decisions estimate cash flow during different periods, it is essential to formulate process of prediction.
F) The process of acquisition assets in firm indicates Rate of management risk.
G) All of the capital projects should be funded and there are no free resources for that.
H) Capital budgeting is always looking for allocation of scarce resources in competitive opportunities for investment [5].

Previous Empirical Studies:

A study about Capital Budgeting and Political Risk was done by holmen [4]. He researched Capital budgeting techniques used by Swedish companies for foreign direct investments. He showed that the using of net present value (NPV) which is the erotically precision decreases with increasing of political risk in the host country, and uses of return on investment method which has the erotically problems increase with increasing of political risk.

A study which compared the capital budgeting process in the Netherlands and China was done by Hermes et al [3]. The goal of this study was analyzes the use of capital budgeting techniques by companies in a comparative perspective between the two countries. The results showed that financial managers of Dutch companies in comparison with Chinese financial managers use the more advanced techniques in capital budgeting, and its Cause was diagnosed the further economic development of the Netherlands than China.

Application of Capital budgeting techniques in business which examine relationship for Capital budgeting operations in commerce among 600 managers of businesses in South Africa was studied by Brijlal and Quesada [1]. the results showed that the return on investment and then net present value method are the most commonly used method among sectors and different sizes of business. In addition to, more than 60% of respondents used non-quantitative techniques considering the risk when making decision sab out investment in fixed assets; and, Only 40 % of respondents used quantitative techniques so as to consider the risk. Results suggest that managers at different levels of trade have limited influence on capital budgeting decision. Although this influence increases with increasing of business size.

Efficiency of capital budgeting in U.S. multinationals was studied by Williams et al [8]. They examined an unbalanced sample of 332 U.S. Firms from 1992 to 2000 and reached this result which large multinational corporations rather than completely domestic firms making more efficient capital budgeting decisions.

Hypotheses:

\[ H_1: \] Do companies in industrial town of Mashhad use payback period method for assessment of long-term plans?
\[ H_2: \] Do companies in industrial town of Mashhad use payback reciprocal for assessment of long-term plans?
\[ H_3: \] Do companies in industrial town of Mashhad use ROA for assessment of long-term plans?
\[ H_4: \] Do companies in industrial town of Mashhad use NPV for assessment of long-term plans?
\[ H_5: \] Do companies in industrial town of Mashhad use IRR for assessment of long-term plans?
\[ H_6: \] Do companies in industrial town of Mashhad use Profitability index for assessment of long-term plans?

Materials and Methods

The research is inductive method, and it is also a periodic study because it studies a specific period of time, and it can be an applied research. Eventually, by using regression models the relationship between earnings quality and changes in stock market value is examined. Samples are selected according to the following conditions:

1) The entities should be listed before 2000.
2) Date financial firms should lead to the end of March each year.
3) The entities should be activated during 2000 to 2010.
4) The entities should not change their financial periods.
5) The entities’ availability of information is required.

Data Collecting Tools:

The present study has been divided into two parts as the following to obtain the required data.

1) **Library studies:** To study the literature of research subject we used mainly books, articles and libraries and especially central libraries of Iran.
2) **Field Researches:** Questionnaire was used to collected the required information and measure the variables of the research

Friedman test:
When the data of \( k \) has similar rating, at least in ordinal scale "two-way analysis of variance by Friedman test for ranking" is used. In the other words, points are ranked by Friedman test. "Friedman test" determines whether the sums of the ranks are significantly different or not.

\[
F = \frac{n(k-1)[\sum_{i=1}^{k} \frac{n_i^2}{n} - \frac{1}{4} nk(k+1)^2]}{\sum_{i=1}^{k} \frac{1}{n_i} - \frac{1}{4} nk(k+1)^2}
\]

\( N = \) Number of rows \( k = \) Number of columns
\( R = \) Sum of rank in the column \( I = \) Rank of numbers in each row

**Reliability and validity:**

The word validity is primarily a measurement term having to do with the relevance of a measuring instrument for a particular purpose. In other word, validity indicates the degree to which an instrument measures what it is supposed to measure. For assessing validity, the questionnaire is vetted by experienced researchers and stated that our measuring instrument is valid and will result in correct measurement.

**Table 1:** Test of the first hypothesis

<table>
<thead>
<tr>
<th>( H_1 )</th>
<th>Frequency</th>
<th>Relative to the total</th>
<th>( Z )</th>
<th>( P )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepting the hypothesis</td>
<td>49</td>
<td>94.2%</td>
<td>6.379</td>
<td>0.000</td>
</tr>
<tr>
<td>Rejection of the hypothesis</td>
<td>3</td>
<td>5.8%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on (\( P\)-value=0.000) and it is less than 0.05; it can be concluded that null hypothesis "companies in industrial town of Mashhad do not use payback period method for assessment of long-term plans" is rejected. Thus, companies in industrial town of Mashhad use payback period method for assessment of long-term plans.

**The second hypothesis:**

<table>
<thead>
<tr>
<th>( H_2 )</th>
<th>Frequency</th>
<th>total (percent)</th>
<th>( Z )</th>
<th>( P )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepting the hypothesis</td>
<td>27</td>
<td>51.9%</td>
<td>0.277</td>
<td>0.391</td>
</tr>
<tr>
<td>Rejection of the hypothesis</td>
<td>25</td>
<td>48.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on (\( P\)-value=0.319) and it is more than 0.05; it can be concluded that null hypothesis “companies in industrial town of Mashhad do not use payback reciprocal method for assessment of long-term plans” is approved. Thus, companies in industrial town of Mashhad do not use payback reciprocal method for assessment of long-term plans.

**The third hypothesis:**

A reliability measure essentially shows us if researcher does a test again and again, the test would provide the same score or the same respondent. I use Cronbach’s alpha it ranges between 0 and 1. The greater the value of alpha, the more the scale is coherent and thus reliable (alpha is actually an approximation to the reliability coefficient). Some authors have proposed a critical value for alpha of 0.70, above which the researcher can be confident that the scale is reliable. (Encyclopedia of Survey Research Methods, Lavarakas).

**Results:**

The first hypothesis is related to assessment of long-term investment projects by using payback period method in industrial city of Mashhad. To investigate this hypothesis, based on the questionnaire to assess respondents who agree and examine statistically examine whether the hypothesis is higher than 50% or not? (This means that the majority of society agrees) and in terms of statistical hypothesis tests using the above ratio can be displayed as follows:

The second hypothesis is related to companies in industrial town of Mashhad use payback reciprocal for assessment of long-term plans. To investigate this hypothesis, based on the questionnaire to assess respondents who agree and examine statistically examine whether the hypothesis is higher than 50% or not? (This means that the majority of society agrees) and in terms of statistical hypothesis tests using the above ratio can be displayed as follows:

The third hypothesis is related to companies in industrial town of Mashhad use ROA for assessment of long-term plans. To investigate this hypothesis, based on the questionnaire to assess respondents who agree and examine statistically examine whether the hypothesis is higher than 50% or not? (This means that the majority of society agrees) and in terms of statistical hypothesis tests using the above ratio can be displayed as follows:
Table 3: Test of the third hypothesis

<table>
<thead>
<tr>
<th>$H_3$</th>
<th>frequency</th>
<th>total (percent)</th>
<th>$Z$</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepting the hypothesis</td>
<td>45</td>
<td>%686.5</td>
<td>5.270</td>
<td>0.000</td>
</tr>
<tr>
<td>Rejection of the hypothesis</td>
<td>7</td>
<td>%13.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on (P-value=0.000) and it is less than 0.05; it can be concluded that null hypothesis “companies in industrial town of Mashhad do not use ROA for assessment of long-term plans” is rejected. Thus, companies in industrial town of Mashhad use ROA method for assessment of long-term plans.

The fourth hypothesis:

Table 4: Test of the fourth hypothesis

<table>
<thead>
<tr>
<th>$H_4$</th>
<th>The estimated parameters</th>
<th>Z</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepting the hypothesis</td>
<td>40, 76.9%</td>
<td>3.883</td>
<td>0.000</td>
</tr>
<tr>
<td>Rejection of the hypothesis</td>
<td>12, 23.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on (P-value=0.000) and it is less than 0.05; it can be concluded that null hypothesis “companies in industrial town of Mashhad do not use NPV for assessment of long-term plans” is rejected. Thus, companies in industrial town of Mashhad use NPV method for assessment of long-term plans.

The fifth hypothesis:

Table 5: Test of the fifth hypothesis

<table>
<thead>
<tr>
<th>$H_6$</th>
<th>The estimated parameters</th>
<th>Z</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepting the hypothesis</td>
<td>39, 75.0%</td>
<td>3.606</td>
<td>0.000</td>
</tr>
<tr>
<td>Rejection of the hypothesis</td>
<td>13, 25.0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on (P-value=0.000) and it is less than 0.05; it can be concluded that null hypothesis “companies in industrial town of Mashhad do not use IRR for assessment of long-term plans” is rejected. Thus, companies in industrial town of Mashhad use IRR method for assessment of long-term plans.

The sixth hypothesis:

Table 6: Test of the sixth hypothesis

<table>
<thead>
<tr>
<th>$H_6$</th>
<th>estimated parameters</th>
<th>Z</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepting the hypothesis</td>
<td>44, 84.6%</td>
<td>4.992</td>
<td>0.000</td>
</tr>
<tr>
<td>Rejection of the hypothesis</td>
<td>8, 15.4%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on (P-value=0.000) and it is less than 0.05; it can be concluded that null hypothesis “companies in industrial town of Mashhad do not use profitability index for assessment of long-term plans” is rejected. Thus, companies in industrial town of Mashhad use profitability index method for assessment of long-term plans.

Four hypotheses related to companies in industrial town of Mashhad use NPV for assessment of long-term plans. To investigate this hypothesis, based on a questionnaire to assess the number of respondents who agree are discusses and statistically examine the hypothesis that it is higher than the 50% of whether (This means that the majority of society agrees) and in terms of statistical hypothesis tests using the above ratio can be displayed as follows:

Table 7: Test of the fourth hypothesis

<table>
<thead>
<tr>
<th>$H_4$</th>
<th>The estimated parameters</th>
<th>Z</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepting the hypothesis</td>
<td>40, 76.9%</td>
<td>3.883</td>
<td>0.000</td>
</tr>
<tr>
<td>Rejection of the hypothesis</td>
<td>12, 23.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on (P-value=0.000) and it is less than 0.05; it can be concluded that null hypothesis “companies in industrial town of Mashhad do not use NPV for assessment of long-term plans” is rejected. Thus, companies in industrial town of Mashhad use NPV method for assessment of long-term plans.

The fifth hypothesis:

Table 8: Test of the fifth hypothesis

<table>
<thead>
<tr>
<th>$H_6$</th>
<th>The estimated parameters</th>
<th>Z</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepting the hypothesis</td>
<td>39, 75.0%</td>
<td>3.606</td>
<td>0.000</td>
</tr>
<tr>
<td>Rejection of the hypothesis</td>
<td>13, 25.0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on (P-value=0.000) and it is less than 0.05; it can be concluded that null hypothesis “companies in industrial town of Mashhad do not use IRR for assessment of long-term plans” is rejected. Thus, companies in industrial town of Mashhad use IRR method for assessment of long-term plans.

The sixth hypothesis:

Table 9: Test of the sixth hypothesis

<table>
<thead>
<tr>
<th>$H_6$</th>
<th>estimated parameters</th>
<th>Z</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepting the hypothesis</td>
<td>44, 84.6%</td>
<td>4.992</td>
<td>0.000</td>
</tr>
<tr>
<td>Rejection of the hypothesis</td>
<td>8, 15.4%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on (P-value=0.000) and it is less than 0.05; it can be concluded that null hypothesis “companies in industrial town of Mashhad do not use profitability index for assessment of long-term plans” is rejected. Thus, companies in industrial town of Mashhad use profitability index method for assessment of long-term plans.
According to the table above and compare the probability values with 95% confidence can be said that:

Payback Period method is very important.
Rate of accounting method is very important.
NPV is very important.
Internal rate of return method is very important.
Profitability index method is very important.

In contrast:
Payback reciprocal is not very important.

Comparison capital budgeting methods:
In following table, rank of methods will be compared by Friedman non-parametric test:

### Table 8: Comparison of capital budgeting

<table>
<thead>
<tr>
<th>Methods</th>
<th>Rank</th>
<th>Chi-square</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payback Period</td>
<td>4.38</td>
<td>98.99</td>
<td>0.000</td>
</tr>
<tr>
<td>Profitability index</td>
<td>4.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal rate of return</td>
<td>3.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>3.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPV</td>
<td>3.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payback reciprocal</td>
<td>1.77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 9: Summary of Hypotheses results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>The statistical Z</th>
<th>P-Value</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>6.379</td>
<td>0.000</td>
<td>Reject</td>
</tr>
<tr>
<td>H2</td>
<td>0.277</td>
<td>0.391</td>
<td>Approved</td>
</tr>
<tr>
<td>H3</td>
<td>3.270</td>
<td>0.000</td>
<td>Reject</td>
</tr>
<tr>
<td>H4</td>
<td>3.883</td>
<td>0.000</td>
<td>Reject</td>
</tr>
<tr>
<td>H5</td>
<td>3.606</td>
<td>0.000</td>
<td>Reject</td>
</tr>
<tr>
<td>H6</td>
<td>4.992</td>
<td>0.000</td>
<td>Reject</td>
</tr>
</tbody>
</table>

### Conclusion:

According to the results of the research units of the industrial town of Mashhad some methods like Capital recovery period, ROA, PV, IRR and profitability index are very important, whereas, asset recovery and reverse procedure is not very important.

Among the methods for assessing long-term investment projects, capital recovery method with the 94.2% and the reverse method of capital recovery with 17.3 percent were the most and least important methods respectively.

If the methods are classified according to degree of importance, it can be reviewed as follows:
1-payback period method 2- Profitability Index 3-IRR4-ROA 5- NPV  6- payback reciprocal

These results, is consistent with Arthur HatzuPlolus indicated that discount methods are complementary of traditional methods rather than replace traditional methods and also capital recovery is still widely applicable. The results of Nasirzadeh’s study showed that firms use more capital recovery and other methods are less applicable.

The results showed that the capital budgeting techniques are used by companies in most industries and to assess the long-term investment plans and it is inconsistent with results of Nakhahaes who concluded that majority of companies do not use capital budgeting technique in order to Acquisition of capital assets. The researchers believe the reasons for these differences in results can be stated in several cases: (1) the economic circumstances (2) lack of sufficient knowledge of managers about finance issues and equipments.

-The results indicate that large units that were more extensive facilities and experienced managers were more familiar with the finances than other the units. They use more capital budgeting methods and also making more efficient decisions. Following, the results of research of William and et al showed that multinationals and large companies use more efficient capital budgeting decisions in comparison with small firms and domestic firms.

Our research shows that 54 percent of long-term investment projects before being implemented. Due to economic conditions have stopped and actual return rate is less than expected return. This study also examined and identified the factors (barriers) in using of capital budgeting techniques in the industrial town of Mashhad barriers and obstacles can be divided into two categories interior (management, personnel accounting and budgeting system) and exterior. Results show that 90% of respondents, internal barriers and 69% external barriers were considered important. Consequently, it can be said that internal and external barriers to the use of capital
budgeting techniques are effective. We compared obstacles by using non-parametric Friedman test and the results indicated that importance of internal and external barriers are essential and importance of internal barriers is more than external.

Obstacles can be classified based on importance degree as follow:
1. Making decisions based on personal judgment.
2. Lack of budgetary controls
3. Inflation and instability of money value
4. Ignoring concept of "accountability" and "responsibility" in the structure.
5. Lack of qualified and experienced personnel in order to analyze financial information
6. The lack of information about similar organizations and economic indicators
7. Ignoring financial information for making decisions
8. Lack of adequate training for using financial techniques in universities

Consequently, making decisions based on personal judgment, lack of budgetary control and lack of the value of money are the most important capital budgeting methods. In contrast, lack of general accounting accepted principle and financial association management is the least important obstacle of using capital budgeting techniques.

Limitations:

According to the method of data gathering was questionnaire; it can be definite that all of information are clear and correct.

Material limitations (economical) will affect the results.

Lack of resources and lack of the required background about Industrial town of Mashhad

References