IMPACT OF CAPITAL BUDGETING TECHNIQUES ON AUTOMOBILE INDUSTRIES IN INDIA- An Empirical Study

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ABSTRACT: ***Capital budgeting is concerned with allocation of the firm's scarce financial resources among the available favorable circumstances. The return of investment opportunities involves the comparison of the expected future returns from a project with immediate and subsequent return for it. The problems in capital budgeting decisions may be*** *Future uncertainty, Time Element, Difficulty in Quantification of impact etc.* ***Since we all know that automobiles companies requires large investment. So In this research, Researcher would like to study the impact of various capital budgeting techniques on the financial variables of the selected company. There is very less study done in India regarding the same. So, there is a need to study the various issues involve in Capital Budgeting Practices in India.***

Keywords- Capital budgeting Techniques, NPV, IRR

INTRODUCTION OF CAPITAL BUDGETING

As all we know that finance is the life blood of every business. In this competitive era the optimal usage of finance is crucial issue. Almost in every business huge amount of funds are required to purchase various assets and for the expansion of business. So before investing huge funds, every organization must know in advance the viability of the assets/projects. Capital Budgeting techniques are used to evaluate the profitability/viability of the concerned projects.

Capital budgeting or **investment appraisal**, is the planning process, which is used to determine whether an organization's long term investments in new machinery, replacement of old machinery with new one, installation of other manufacturing equipment, lunching of new products and research development projects are worth-full for the organization or not. In other words we can say that Capital budgeting is the process in which a business determines and evaluates projected investments that are large in nature.
There are number of **evaluation techniques** which may be recommended for evaluating the capital investment proposals. These methods can be classified into the following categories:

I. Traditional Techniques:
Traditional techniques are grouped in to the following:
(1) Pay-back period method.
(2) Improvement of Traditional Approach to Pay-back Period Method.
(a) Post Pay-back profitability Method.

(b)Reciprocal Pay-back Period Method.
(3) Rate of Return Method or Accounting Rate of Return Method.

II. Time Adjusted Technique or Discounted Cash Flow Techniques
Time Adjusted Method further classified into:
(1) Net Present Value Method.
(2) Internal Rate of Return Method. (IRR)
(3) Profitability Index Method.
(4) Modified Internal Rate of Return (MIRR)
(5) Hurdle Rate
(6) Earnings Multiple Approach
(7) Adjusted Present Value (APV)
(8) Discounted Payback-Period

INTRODUCTION OF AUTOMOBILIE COMPANIES

The **automotive industry in India** is one of the largest in the world with an annual production of 23.37 million vehicles in FY 2015-16, following a growth of 8.68 per cent over the last year. The automobile industry accounts for 7.1 per cent of the country's gross domestic product (GDP). The Two Wheelers segment, with 81 per cent market share, is the leader of the Indian Automobile market, owing to a growing middle class and a young population. Moreover, the growing interest of companies in exploring the rural markets further aided the growth of the sector. The overall Passenger Vehicle (PV) segment has 13 per cent market share.

India is also a prominent auto exporter and has strong export growth expectations for the near future. In FY 2014-15, automobile exports grew by 15 per cent over the last year. In addition, several initiatives by the Government of India and the major automobile players in the Indian market are expected to make India a leader in the Two Wheeler (2W) and Four Wheeler (4W) market in the world by 2020.

Role of Automobile Industry in India GDP-Facts

- India has become one of the international players in the automobile market
- The four wheelers include passenger cars, multi-utility vehicles, sports utility vehicles, light, medium and heavy commercial vehicles, etc
- The three wheelers include mopeds, motor-cycles, scooters, and three wheelers
- India ranks 2nd in the global two-wheeler market
- India is the 4th biggest commercial vehicle market in the world
- India ranks 11th in the international passenger car market
- India ranks 5th pertaining to the number of bus and truck sold in the world
- It is expected that the Automobile Industry in India would be the 7th largest automobile market within the year 2016

(Source:www.business.mapofindia.com/india/gdp/industries/automobile)

LIST OF 40 COMPAINES UNDER STUDY

S.NO	COMPANY NAME
1	ATUL AUTO LIMITED
2	ASHOK LEYLAND LTD
2	AUDI INDIA PVT LTD
4	BAJAJ AUTO LIMITED
5	BMW
6	BHARAT BENZ LTD.
7	BAVINA CARS
8	DATSUN
9	DAIMLER AG
10	DECCAN AUTO LIMITED
11	ESCORT LTD
12	EICHER MOTORS LTD.
13	FORCE MOTORS LTD
14	FIAT INDIA AUTOMOBILIES
15	HINDUSTAN MOTORS (HML)
16	HERO MOTOR CORP:
17	HONDA CARS INDIA LTD (HCIL)
18	HYUNDAI MOTOR INDIA LTD
19	INDIA YAMAHA MOTOR PRIVATE LIMITED (IYM)
20	ISUZU MOTORS LTD.
21	INTERNATIONAL CARS AND MOTORS LTD.
22	KOMATSU LTD
23	KAMAZ MOTORS LTD
24	KIA MOTORS
25	KINETIC MOTOR COMPANY
26	MAHINDRA & MAHINDRA
27	MARUTI SUZUKI INDIA LIMITED
28	MAN TRUCK INDIA PRIVATE LTD.
29	MITSUBISHI MOTORS CORPORATION
30	MERCEDES-BENZ INDIA PVT LTD
31	NISSAN MOTOR INDIA PVT LTD
32	PIAGGIO & C. SPA
33	SKODA AUTO INDIA PVT LTD.
34	SAIC MOTOR CORPORATION LIMITED
35	SUZUKI MOTORCYCLE INDIA, PRIVATE LIMITED (SMI)
36	SML ISUZU LIMITED

37	TVS MOTOR COMPANY
38	TAFE – TRACTORS AND FARM EQUIPMENT LIMITED
39	TATA MOTORS
40	TOYOTA MOTORS LTD.

REVIEW OF LITERATURE

Jog and Srivastava (1991) surveyed the large Canadian corporations and provide direct empirical evidence on the capital budgeting process. They found many critical issues viz., cash flow forecasting methods, methods used to estimate the cost of capital and the cost of equity and the use of capital budgeting techniques risk analysis techniques. He concluded that most of the firms used multiple capital budgeting methods to evaluate capital investments however DCF methods were employed by more than 80% of our respondents to evaluate projects such as foreign operations and leasing, expansion-new operations and expansion-existing operations.

Block Stanley (2000) has surveyed the capital budgeting policies and procedures of 150 multinational companies in light of current financial theory. He had examined that some of the policies that MNCs used for the capital budgeting decisions are the logical extensions of domestic practices into the international area, while others appear to be misguided changes to normal capital budgeting procedures. According to his study, there are a number of misapplications such as applying corporate wide weighted average cost of capital to foreign affiliate cash flows rather than to cash flows actually remitted to the corporations. Also, risk is frequently measured on a local project basis (in a foreign country) rather than considering the multiple effect on the total corporations. Of the 150 survey respondents in this study, 69.7% believe that international investments increase the risk exposure of the firm and establish policies on that premise. Finally, he has shown that the survey respondents hedge against the uncertainty of the procedures by adding an importance to the weighted average cost of capital as computed by financial analysts given the inconsistent procedures that are often utilized in going from domestic to international capital budgeting.

Ryan Patricia A and Ryan Glenn P. (2002) had evaluated the capital budgeting decision methods used by the 800 manufacturing companies. According to him, most of the most of the companies preferred NPV as capital budgeting tool, which represents alignment between corporate theory and practice. Firms with larger capital investment budgets tend to favor NPV and IRR. PBP is used at least half of the time by 73.7% of the respondents. Fourth in popularity was the discounted payback model used at least half of the time by 58.9% of the companies. Finally at least half time usage was reported for the three models as follows. PI ranks fifth at 43.9%, followed by ARR at 32.3% and finally, IRR at 24.7%.

Gupta Sanjeev, Batra Roopali and Sharma Manisha (2007) had made an attempt to find out which capital budgeting techniques is used by manufacturing industries in Punjab, and the influence of factors such as size of capital budget, age and nature of the company, and education, gender and experience of the CEO in capital budgeting decisions. They conducted a primary survey of 40 companies in Punjab. Almost one-third of the companies had capital budget exceeding Rs. 150million. Majority of the sample companies still use non-discounted cash flow techniques like PBP and ARR. Only a few companies use DCF, and among them very less number use NPV technique to evaluate a new project. The most preferred discount rate is WACC. The most popular risk incorporating technique is 'Shorter PBP. Many companies feel that CEO education and experience play an important role in selecting the capital budgeting technique. Further, the study did not find any significant relationship between the size of capital budget and capital budgeting methods adopted. Similarly, though at some instances it appears that young companies prefer DCF techniques than the older ones, the same is not true in case of NPV method.

Klammer, Thomas P. (2008) took a sample of 348 firms in France from the 2001 listing of manufacturing firms that appeared in significant industry groups and invest at least $1 million of capital expenditures in each of the five years 2001-2006. He concluded that Present value method was most popular among the various manufacturing companies.

Pettway (2009) surveyed a random sample of 310 business firms. Questionnaire were sent to companies through mail engaged in retailing, manufacturing transportation, land development, entertainment and public utilities to study the capital budgeting process and the methods used to adjust for risk. He concluded that firms considered the Internal Rate of Return technique to be the most important technique for decision-making. He also conclude that the most of firms enhanced their profitability requirements to adjust for risk and uncertainty in the given project and determining the future cash flow projections as the most important and most difficult stage of the capital budgeting process.

Lawrence G. and Forrester (2010) analyzed the responses of 125 manufacturing firms that reported as having the greatest stock price growth over the 2004-2009 periods. The survey containing questions related to techniques used in capital budgeting process , the division of responsibility for capital budgeting decisions, the most important and most various difficulties faced in implementation of capital budgeting techniques, the cutoff rate and the various methods used to evaluate the risk factor. They reported that the DCF techniques were the most popular methods for evaluating projects, especially the IRR. However, many firms still used the PBP method as a backup or secondary approach. The most of the companies that responded to the survey indicated that the Research and Development and Finance Department were responsible for evaluating the capital budgeting projects. They conclude that most of the respondent found difficulty in the project definition and cash flow estimation and they considered these as most critical stage of the capital budgeting process. The most of the firms had a cutoff rate between 11% to 16%, and they most often adjusted for risk by increasing the minimum acceptable rate of return on capital projects.

Brighman (2011) conducted the research study of the capital budgeting projects of 15 large manufacturing firms, he found that although techniques that smaller firms prefer PBP method to evaluate the investment proposal but large manufacturing firms most relied on discounted cash flow techniques. Moreover these manufacturing firms assumed some variable constant when discounted cash flow techniques were used. For example, some firms' simplifying assumptions include the use of the same economic life and same cash inflows for all projects even though the actual lives and actual cash flows might be different. Further, firms often did not make any adjustment regarding analysis for risk. This survey indicated the result that most of firms preferred discounted techniques.

Adeniyi (2012) asserted that in spite of the theoretical limitations of the payback period method, it is the one that is most widely used in practice. He offered the following reasons for its usage: it is easily understood by all levels of management; it provides an insight on how quickly the initial can be recouped; most managers see risk as time-related i.e. the longer the period, the greater the chance of failure; where a firm faces liquidity constraints and requires a fast repayment of investments, the pay-back period is more useful; it is appropriate in situations where risky investments are made in uncertain markets that are subject to fast design and product changes or where future cash flows are particularly difficult to predict.

Meigs, et al (2014) a business may benefit from good capital budgeting decisions and suffer from poor ones for many years. Many non-financial factors are also considered in making capital budgeting decisions. For example, many companies give high priority to creating new jobs and avoiding layoffs. However, it is also essential that investments in plant assets earn a satisfactory return on the funds available to finance the project and the company will not be able to generate sufficient funds for future investment projects. The capital budgeting techniques are classified into two -non discounted cash flow and discounted cash flow techniques.

Masa, Imegi and Akenbor (2015), investment decisions relate to the corporate decision to invest its resources in the most efficient manner in business activity with the hope that the activity will, in turn, generate a stream of future returns over time. It asks the question; into what uses do we put the available funds of the business such that we become better in the future? It is the responsibility of the financial experts in collaboration with the accountants to analyse and decide on the type of asset to commit a firm's funds in anticipation of future returns.

RESEARCH METHODOLOGY AND OBJECTIVES

Statement of the Problem

Capital budgeting is concerned with allocation of the firm's scarce financial resources among the available favorable circumstances. The return of investment opportunities involves the comparison of the expected future returns from a project with immediate and subsequent return for it. The problems in capital budgeting decisions may be **Future uncertainty, Time Element, Difficulty in Quantification of impact etc.**
Since we all know that automobiles companies requires large investment. So In this research, Researcher would like to study the impact of various capital budgeting techniques on the financial variables of the selected companies. There is very less study done in India regarding the same. So, there is a need to study the various issues involve in Capital Budgeting Practices in India.

Objectives

1. To study the procedure of Capital Budgeting in selecting companies.
2. To study the challenges and problems in estimation of operating cash flows.
3. To study the method adopted for Capital Budgeting in selecting companies.

Hypotheses of the Study

Ho1. Correlation between fixed investments and the selected financial factors (i.e. total revenue, net profits, market capitalization price etc.) is not significant.
Ho2. There is no risk and uncertainty in the future estimates in investment projects.

Research Methodology

The present section elucidates the research methodology of the present study. It presents the research design, target population, collection of data tools and techniques used to study the set objective and interpretation of tools.

Data Processing and Analysis:

The data will be processed using the Microsoft Windows Excel. Along with that the mix of appropriate analytical tools and techniques including statistical tables, simple frequency tables, percentages, arithmetic mean, chi square, correlation , regression , t-test , two way ANOVA analysis and Factorial test with one factor and one blocking variable are used to analyze the data and address the research problem.

The questionnaire was comprised of 24 questions which were mainly close ended. All the questions were dichotomous, multiple choice questions based on Likert scale. The primary data were analyzed by applying tabular and chi-square analysis using SPSS rigorously.

Table-1.
Companies prefer capital budgeting techniques

Particular	Frequency	%age
Prefer (Yes)	37	92.5
Not prefer (No)	03	7.5

The results of TableNo-1 Shows that out of 40 companies 37 companies (i.e. 92.5%) prefer to use capital budgeting techniques to evaluate their long term investment decisions.

Table-2
Size of Annual Capital Budget

Average Size of Capital (In Lakhs)	Frequency	%age
Less than or equal to 100	**2**	**5.405**
101-500	**6**	**16.22**
501-1000	**8**	**21.62**
1001-5000	**9**	**24.32**
Above 5000	**12**	**32.43**
Total	**37**	**100**

All the companies responded to the survey indicated that they are using capital budgeting methods have specific amount of average size of annual capital budget. The results are summarized in the above **Table 2**. The median size of annual capital budget of Indian firms is Rs. 1222.72 Lakhs.

Table -3
Project Size Requires a Formal Quantitative Analysis

Amount	Frequency	%age
0-50000	**1**	**2.703**
50001-100000	**6**	**16.22**
100001-500000	**6**	**16.22**
500001-1000000	**7**	**18.92**
1000001-500000	**9**	**24.32**
Above 5000000	**8**	**21.62**
Total	**37**	**100**

The researcher also wanted to know the project size that requires a formal quantitative analysis in the Indian firms. As one can observe in **Table - 3**, all project size requires a formal quantitative analysis. However, as per the opinion of some respondents, the use of capital budgeting techniques for evaluating capital expenditure projects depends on the nature and size of the particular projects. The median size of the project requiring formal quantitative analysis is Rs. 500000.5

One of the objectives of this study is to determine which of the quantitative evaluation techniques are currently used by firms operating in India. Therefore, the researcher wants to know whether the firms are using theoretically sound investment appraisal techniques. There are mainly two types of techniques used in evaluating projects viz., discounted cash flow/Time-adjusted techniques like NPV, IRR and PI which takes into account the time value of money and Non-discounted cash flow/Traditional techniques like PBP, ARR. The firms were asked to indicate the relative importance of each of quantitative techniques on a Likert Scale of 1 to 5 (where 1 = not used, 2=unimportant, 3=somewhat important, 4=important and
5=very important). This approach not only reveals which of the techniques are used, it also provides information on the relative importance of each technique in decision-making.

Table -4
Importance of Quantitative techniques

Evaluation Technique	1	2	3	4	5
Internal Rate of Return (IRR)	9.8%	19.6%	9.75%	25.8%	35.05%
Payback Period (PBP)	5%	0%	10%	30%	55%
Net Present Value (NPV)	4%	5%	8%	29.5%	53.5%
Accounting Rate of Return (ARR)	62.8%	6.3%	12.4%	8%	10.5%
Profitability Index (PI)	54.85%	18.65%	15.75%	6.25%	4.5%
Modified Internal Rate of Return (MIRR)	70.65%	5.65%	12%	2.35%	9.32%

The results are shown in **Table-4** ranked according to perceived importance. The responding firms ranked PBP (55%), NPV (53.5%) and IRR (35.05%) and as the most important techniques respectively. Among these techniques PBP is getting highest rating even though it ignores time value of money and it also ignores cash flow beyond payback period. It seems as it is easy to calculate and understand, PBP is still a very popular technique. Although it is not directly comparable, these results are consistent with the findings of Wong, Farragher and Leung (1987), who found that payback, IRR and ARR were equally the most popular techniques. However, NPV is ranked second and IRR is ranked third as the most important but 35.05 % consider it as most important technique in this survey. Surprisingly, only 10.5% consider ARR as most important technique, in fact 62.8% respondents are not using this technique at all.

Table -5
Techniques Used for evaluating various investment decisions

S.NO.	**Investment Decision**	IRR	PBP	NPV	ARR	PI	MIRR	Any other
1	New Project	21.5	78.8	40.8	-	4.4%	-	-
2	Expansion of existing operation	28.5	85.4	19.8	3.8	-	4.85%	-
3	Merger / Acquisition	14.45	64.5	50.65	2.4%	3.9%	-	-

4	Replacement of Assets	12.63	49.85	25.85	12.85%	1.6%	-	-
5	Leasing of Assets	18.67	52.67	30.45	1.75%	2.65%	2.75%	-
6	Modernization	20.65	62.85	32.89	4.79%	3.89%	-	-
7	Process or Product improvement	12.63	42.65	29.85	3.96	-	-	-
8	Any other (please specify)	-	-	-	-	-	-	-

As there are multiple responses the total per cent may exceed 100 %.

One can observe that PBP (78.8%), NPV (40.8%) and IRR (21.5%) respectively are the most preferred techniques for evaluating new capital budgeting projects. PBP is most preferred method used in various investment decisions. The respondents prefer even NPV in the second preference in various decisions. However the %age of ARR,PI and MIRR is very low.

Table -6
Ranking of Discount Rate (Cost of Capital)

S.NO	Particulars	%AGE
1.	Weighted Average Cost Of Capital (WACC)	47.5%
2	Cost of Debt	14.5%
3	Cost of Retained Earning	6.75%
4	Historical rate of return	2.65%
5	Cost of New Equity	7.75%
6	Bank Rate	13.5%
7	Term lending rate	4.85%
8	Arbitrary cut off rate	2.5%

The results summarized in the above **Table-6** indicates that the 47.5% respondents are using WACC as the discount rate which assumes that proposed projects are having same degree of average risk and investment projects are financed out of pool of funds. However, very few firms (2.5%) are using arbitrary cut-off rate fixed by the management. The results of the study are consistent with the results of the study by Jog and Srivastava (1995) who found out that WACC was used by 37.85% of the Canadian firms for calculating cost of capital which corresponds to the theory that considers WACC as the sound method for determining cost of capital.
One of the very important components for determining WACC for any firm is to estimate the cost of equity and cost of retained earnings. This question was asked to finance officers of the surveyed firms who were using WACC as the discount rate for evaluating their capital budgeting projects. At the same time some companies also used cost of debt (14.5%) and bank rate (13.5%).

Table -7
Ranking the factors that affect Capital Budgeting Techniques

S.NO	Particulars	%AGE
1.	Finance Theory	12.36%
2	Experience and Competency	42.49%
3	Informal Rule of Thumb	NIL
4	Importance of Project	22.50%
5	Easy Understandability	10.65%
6	Familiarity of Top Management with Method	12%

There are a number of factors deciding capital budgeting methods in a company. As shown in the Table 7 experience and competency (42.49%) is considered as the most important factor influencing the decision of selecting capital budgeting method. The importance of the project is also considered as an important factor (22.5%). The finance theory has also got some weight age in selecting methods which may be due to academic background of the finance decision-makers. One note worthy point here is no firms prefer informal rule of thumb for investment appraisal.

Table -8
Stages of capital budgeting process in order of performance

S.NO	Particulars	%AGE
1.	Project Definition & cash flow estimation	20.15%
2	Financial analysis & project selection	37.85%
3	Project Implementation	29.85%
4	Project Review	12.15%

As the there are various stages of capital budgeting process and every stage require attention according to their importance. According to the responses of the respondent the most important stage is financial analysis & project selection (37.85%). As finance is the life blood of every

business. Most of the weight age given to financial analysis. Project implementation stage is also very crucial stage because it shows whether the company decision is sound or not. Project definition & cash flow estimation stage is also very important because it hold 3rd place in ranking.

Table -9
Stages of capital budgeting process in order of difficulty

S.NO	Particulars	%AGE
1.	Project definition & cash flow estimation	48.56%
2	Financial analysis & project selection	20.29%
3	Project Implementation	24.45%
4	Project Review	6.7%

The results summaries in **Table-9** show the order of difficulty in capital investment decisions. According to the respondents the most difficult stage is Project definition and cash flow estimation (48.56%). As project definition based on critical research of the companies and cash flow estimation based various future estimations like return rate, cost of capital etc. The second most difficult stage is Project implementation (24.45%) because whenever new projects are implemented a lot of risk factor arises internally as well as externally. The third most difficult stage is financial review (20.29%) and after that Project Review (6.7%). As every company has set standards for project review. So, it is less risky stage.

Table-10
Hierarchical Level Of Personnel

S.NO	Particulars	%AGE
1.	Lower Level Management	4.57%
2	Middle Level Management	10.98%
3	Top Level Management	84.45%

Most important decisions of the organizations are taken by top management. So according to the response of the respondents 84.45% decisions are taken by management. However the representatives of the middle management (10.98%) and lower level also took participation in decision making.

Table-11
Perceived Risk in Investment

S.NO	Particulars	%AGE
1.	Fluctuation in expected return	20.42%
2	Non-Recoverable investment	14.02%
3	Fear of obsolescence	65.56%

Automobile industries involve usage of latest technology and high level of inventions. So among the automobiles company the most perceived risk is fear of obsolescence (65.56%). It means that more than half of the companies have risk of obsolescence.

Table-12
Different Source of Risk

S.NO.	**Sources of Risk**	***MI***	***I***	***Can't say***	***UI***	***MUI***
A)	Project specific risk: like quality of management, shortage of raw material, skilled labour /infrastructure/electricity/power.	48.25%	20.65%	4.1%	1.25%	NIL
B)	Competitive risk: affected by unanticipated actions of Competitors	58.85%	41.15	Nil	Nil	Nil
C)	Industry specific risk: unexpected technological developments ,regulatory changes, govt. policy changes	47.52%	30.58%	11.89%	8.11%	1.9%
D)	Market risk: changes in macro economic factors like GDP growth rate ,fluctuations in demand, interest rate, inflation rate	28.28%	26.42%	15.48%	24.52%	5.3%
E)	International risk: in case of foreign project, earnings and cash flows may be different than expected due to exchange rate risk or political risk.	69.75%	21.97%	5.64%	2.64%	.25%
F)	Retaining Human resources/manpower	48.62%	23.67%	11.66%	5.63%	10.42%

Table-12 explains the percentage of different sources of risk in a particular project. In case of project specific risk most of the companies (48.25%) perceived it most important source of risk. It is important to note that not even a single company considers it as most unimportant. At the same time more than half of the companies (58.85%) perceived competitive risk as the most important risk and 41.15% respondents consider it as an important risk. Again no company agrees that it is unimportant or most unimportant source of risk. Industry specific risk, market risk, international risk and retaining human resources all are the most important risk for automobiles companies.

Table-13
Different Risk Factor in investment decisions.

S.NO.	**Risk Factors**	MI	I	Can't say	UI	MUI
A)	Product price risk	38.53%	28.42%	12.58%	17.42%	8.95%
B)	Risk of unexpected inflation	60.65%	28.95%	5.4%	1.8%	3.2%
C)	Company Size (small firms being riskier)	70.45%	20.45%	4.2%	4.8%	.1%
D)	Interest rate risk (change in general level of interest	48.23%	29.67%	15.85%	2.75%	3.5%
E)	Distress risk (probability of bankruptcy)	30.25%	20.06%	14.69%	29.34%	5.67%
F)	Momentum (recent stock price performance)	53.85%	29.36%	11.36%	2.76%	2.67%
G)	Foreign exchange risk	47.63%	29.8%	6.68%	10.2%	5.69%
H)	"Market-to-book" ratio	42.65%	30.5%	1.65%	19.67%	5.53%
I)	GDP or business cycle risk	78.67%	14.25%	2.75%	2%	2.33%
J)	Term structure risk	27.65%	22.75%	7.51%	15.42%	28.67%

In every long term investment there are various types of risks. Some are systematic and some are non- systematic risk.**Table-13** reveals the various risk factors in capital investment decisions. According to respondents every type of risk listed in above table is most important. The basic reason of their viewpoint is involvement of huge capital investment in new projects. Therefore every automobile company wants to reduce every type of risk in earlier stage.

Table-14
Techniques of Risk Analysis in investment decisions

S.NO.	**Method**	***Never***	***Rarely***	***Sometimes***	***Often***	***Always***
A)	Calculated Bail -out factor	.97%	1%	1%	74.67%	22.36%
B)	Probability theory	3.87%	8.13%	54.67%	22.36%	10.97%
C)	Utility Theory	3.67%	7.52%	5.52%	46.67%	36.62%
D)	Decision Tree Analysis	17.5%	19.25%	24.26%	27.63%	11.36%
E)	Hillier Model	24.5%	26.75%	19.67%	21.68%	7.4%
F)	DCF Break Even Analysis	2.54%	4.5%	2.5%	47.53%	42.93%
G)	Monte Carlo Simulation	22.59%	7.45%	6.91%	35.64%	27.45%
H)	Scenario Analysis	14.33%	11.65%	8.74%	29.65%	35.63
I)	Sensitivity Analysis	1.83%	6.45%	3.55%	52.5%	35.67%
J)	Certainty Equivalent Approach	4.67%	1.82%	42.67%	29.67%	21.17%
K)	Conservative Estimates of Future Cash Flows	6.98%	18.92%	25.26%	22.97%	25.87%
L)	Shorter Payback Period	.3%	1.48%	.25%	57.67%	40.3%
M)	Risk Adjusted Discount Rate/Higher Cut Off Rates	18.74%	12.24%	19.63%	26.67%	22.72%
N)	Judgment Evaluation	27.89%	15.58%	18.90%	20.2%	17.43%
O)	No formal technique is used	80.65%	10.45%	9%	Nil	Nil

In every capital budgeting decision, there are some type of risk. There are various types of techniques which are used to reduce or measure the degree of risks. **Table-14** reveals risk analysis techniques used by the automobiles companies. According to the responses of the respondents the most important techniques that they **often used (74.67%)** is **Bail out factor.** The results of the study are consistent with the results of the study by Gupta (2012). Utility theory is also very popular among the automobiles companies which is often used (46.67%) by these companies. Shorter payback period is also often used (57.67%) by the automobiles companies.

Table -15
Statistical measure used by the Automobiles Companies to assess Risk

S.NO	**Particulars**	**%AGE**
1.	Range	3.13%
2	Standard Deviation/ Coefficient of variation	57.47%
3	Semi-Variance	9.75%
4	Expected NPV	29.68%

There are various statistical techniques to measure the risk and most of the companies used these techniques to assess the risk. **Table-15** reveals the various statistical techniques used by the companies to assess the risk. According to the respondents the most used technique is **Standard deviation/ coefficient of variation (57.47%)** and the second important technique used by the company is **Expected NPV(29.68%).** However very few companies used semi- variance (9.75%) and Range (3.13%)

Table -16
Non-Financial criteria used in investment decisions.

S.NO.	Particular	% age
1	Non-financial grounds are not considered	9.75%
2	capacity availability	52.46%
3	Availability of HR	14.54%
4	Technical Necessity to invest	12.48%
5	Tax Benefit/incentive	22.8%
6	Govt Regulation/Norms	52.45%
7	Environment constraints	27.2%
8	Country interest/Govt direction in particular area	56.45%
9	Need to meet competition	42.45%
10	Availability of Suitable Project Location	48.82%
11	Availability of Suitable technology	32.42%
12	Availability of manpower for the project	30.32%
13	Availability of raw material, power and other basic amenities for the project	28.39%
14	Customer market in case of new projects/Demand of new product	84.57%
15	Necessity of maintaining existing programs or product lines	10.2%
16	Safety of employees or the public	47.5%
17	SWOT Analysis undertaken before acceptance	42.85%

As there are multiple responses the total per cent may exceed 100 %.
The results for the acceptance of non-financial criteria used in making investment decisions have been summarized in **Table-16**. Most of the respondents say that health and safety, legislation and social or environmental factors are mainly responsible for accepting such projects. Though more than one half of the survey participants also believe that customer market in case of new projects/ Demand of new product is sometimes responsible for the acceptance of non-financial criteria.

Table -17
Treatment of Following Items in Estimating Cash Flow

S.NO.	Particular	Included	Excluded
1	Expenses incurred prior to deciding on going ahead with the project like R&D, market survey, test marketing, etc.	46.65%	53.35%
2	Interest on borrowings	45.65%	54.35%
3	Working capital including changes over the life of the project	60.49%	39.51%
4	Salvage/realizable value from the project at the end	80.45%	19.55%
5	Depreciation	53.6%	46.4%
6	Income tax	59.67%	40.33%
7	Current Market value of an existing resource to be used in the project (e.g. land)	84.67%	15.33%

Certain items like expenses incurred prior to deciding on going ahead with the project like R&D, market survey, test marketing, etc., interest on borrowings, depreciation, income tax and so on should be actually excluded while estimating cash flows but some of survey participants have indicated that they include it while calculating cash flows. There are certain items like working capital including changes over the life of the project, salvage/realizable value from the project at the end etc. should be included in cash flows determination but many participants have shown they exclude it while estimating cash flows.

Table -18
Treatment of Following Items in Estimating Cash Flow

S.NO.	Particular	%age
1	Specify cash flow in constant prices and apply a real rate of return	30.63%
2	All cash flows expressed in inflated price terms and discounted at the market rate of return	43.64%
3	Considered at risk analysis or sensitivity analysis	43.64%
4	No adjustment	15.67%

As there are multiple responses the total per cent may exceed 100 %.

As observed in the table, the equal numbers of firms (40.74%) prefer to adjust for inflation by expressing all cash flows in inflated price terms and discounted at the market rate of return or considering sensitivity analysis. Very few companies (15.67 %) are not making any adjustment for inflation in their capital budgeting decisions.

FINDINGS AND CONCLUSION

A typical investment or capital budgeting decision involves certain sacrifice of resources now, in exchange for an uncertain but hopefully large inflow of resources in the near or distant future. Capital budgeting decision is considered to be the most important and crucial decision among the four finance functions, because it determines the value of a firm by influencing its growth, profitability and risk. This decision, if undertaken judiciously, helps in providing the benefits of maximization of wealth, not only for the concerned organization and industry, but also for the economy as a whole. On the other hand, if this decision is not given its due importance, it will ultimately lead to the decline and demise of even a growing and prosperous organization.

1. The hierarchical level of personnel involved in taking capital budgeting decisions, in majority of the companies, is the senior level management. These companies consider it as a higher level decision which is taken primarily at the senior level of management.
2. Moreover, formal capital budgeting analysis is done for investments in projects of smaller capital outlay even for less than Rs. 1 crore. This is because capital budgeting is a crucial decision which affects the value of a firm. A wrong project selection will not only waste the financial resources but will also dampen the value of a firm.
3. Almost four-fifth of the sampled companies reported Expansion of existing business as the investment project in which they invested.
4. The survey revealed that among the traditional methods, Payback period and, in the discounted category IRR and NPV are the most preferred ones by the companies in Indian corporate sector.
5. The survey reveals that the main reasons for non usage of DCF techniques (though by a few companies) are its 'non-suitability of these techniques as per the business condition', 'high level of complexity and difficulty of these techniques' and 'unwillingness of top management to implement' these techniques.
6. Our survey reveals that, in practice WACC is the most preferred discount rate which supports the academic theory also. This is so because it reflects the weighted average cost of all different sources of funds used by a company in one percentage figure.
7. Majority Indian companies use quantitative methods for estimation of cash flows. This is so because the mathematical or quantitative procedures give more accurate estimates than subjective estimates.
8. Further, majority of Indian companies make an adjustment in cash flows for incentive, subsidies and rebates availed from the Government.
9. Project Definition and Cash Flow Estimation was obviously ranked third in risk perception and the Project Review was considered the least risky of all. Thus, in the Indian corporate sector Financial Analysis and Project Selection along with the Project Implementation stage was considered to be still relatively more risky
10. Our survey reveals that majority of Indian companies perceive 'fluctuation in expected return' as a risk followed by 'non-recoverability of investment'. However, Information, Communication and Technology sector is an exception where 'fear of obsolescence' is also perceived as a prime risk.
11. 'Competitor risk', 'Market risk' and 'Project specific risk' are rated as the most important among the different sources of risk in a project by Indian companies.
12. Our survey revealed that the most popular techniques among Indian companies for incorporation of risk are Sensitivity analysis followed by shorter payback period, Scenario analysis and Conservative estimates of cash flows. Risk adjusted discount rates and Judgment evaluation is also used though not much.
13. Our survey reveals that qualitative or nonfinancial criteria play a major and significant role in investment decisions. Indian Companies give due importance not only to financial analysis but also to multiple non financial considerations while selecting an investment proposal. 'SWOT analysis to fit corporate objectives and strategy' and 'Customer market in case of new product/demand analysis' are found to be highly important non financial criteria before selecting an investment.

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ANNEXURE-1

QUESTIONNAIRE

I, Poonam, research scholar at IKG PTU, Jalandhar is doing PHD on the topic "**Impact of Capital Budgeting techniques on Automobile industries in India- An Empirical Study".** The information filled by you will not be disclosed at all & it will be used absolutely for an academic purpose only. Please fill the appropriate option.

SECTION A: Demographic Profile:

Details of the respondent

1. Name:
2. Designation:
3. Work Experience with the present company…
4. Have you attended any Management Programs/courses?
   Yes (pl. give details) No □

.....

About the company:

1. Name of the company: .....
2. Year of Establishment: .....
3. Nature of business: .....
4. Whether Public or Private sector? : .....

SECTION B: Method adopted for Capital Budgeting in selecting companies

5. Do you / your company use any capital budgeting methods like payback period (PBP), Net present value (NPV), internal rate of return (IRR) etc for evaluating investment decision ?

   Yes …… No……

If No, please skip section B and proceed to Section C.

6. What is the average size of your company's annual capital budget ?

(Average size (Rs. in Lacs))
Less than or Equal to Rs. 100 ……
101-500 ……
501-1000 …….
1001-5000 ……
Above 5000 ……

7. What project size requires a formal quantitative analysis in your company?

Size (Rs.)
No specific amount …….
0 to Rs. 50,000 …….
50,001 to 1, 00,000 …….
1, 00,001 to 5, 00,000 …….
5, 00,001 to 10, 00,000 …….
10, 00,001 to 50, 00,000 …….
Greater than 50, 00,000 ……..

8. "Please indicate the relative importance of each of the following quantitative techniques used in your firm to rank proposed capital investments and to decide whether or not they should be accepted for inclusion in the capital budget (on a scale of 1 to 5, where 1 = not used, 2=unimportant, 3=somewhat important, 4=important and 5=very important)."

Evaluation Technique	1	2	3	4	5
Internal Rate of Return (IRR)					
.Payback Period (PBP)					
Net Present					

Value (NPV)					
Accounting Rate of Return (ARR)					
Profitability Index (PI)					
Modified Internal Rate of Return (MIRR)					
Any other(Please Specify)					

9. Please tick the capital budgeting technique used by you for evaluating various investment decisions. You may tick multiple techniques if used.

S.NO.	**Investment Decision**	IRR	PBP	NPV	ARR	PI	MIRR	Any other
1	New Project							
2	Expansion of existing operation							
3	Merger / Acquisition							
4	Replacement of Assets							
5	Leasing of Assets							
6	Modernization							
7	Process or Product improvement							
8	Any other (please specify)							

10. In estimating the cash flows, how do you treat the following items?

S.NO.	Particular	Included	Excluded
1	Expenses incurred prior to deciding on going ahead with the project like R&D, market survey, test marketing, etc.		
2	Interest on borrowings		
3	Working capital including changes over the life of the project		
4	Salvage/realizable value from the project at the end		
5	Depreciation		
6	Income tax		
7	Current Market value of an existing resource to be used in the project (e.g. land)		

11. What is the inflation adjustment methods used while estimating cash flow by your firm? You may tick more than one item.

S.NO.	Particular	
1	Specify cash flow in constant prices and apply a real rate of return	
2	All cash flows expressed in inflated price terms and discounted at the market rate of return	
3	Considered at risk analysis or sensitivity analysis	
4	No adjustment	

Section-C Ranking of Capital Budgeting Techniques and various factors affecting the capital budgeting decision-

12. Rank the following **discount rate/cut off rate** in terms of preference from ***1 (Most Preferred) to 8(Least Preferred.)***

i) Weighted Average Cost of Capital ….
ii) Cost of Debt…..
iii) Cost of Retained Earnings……
iv) Cost of New Equity….
v)Term Lending Rate of Financial Institutions…
vi) Historical Rate of Return….
vii)Bank Rate……
viii) Arbitrary Cut Off……..

13. **Rank** the following factors that affect capital budgeting techniques in order of importance from ***1(Most Important) to 6(Least Important).***

i) Finance Theory … ii) Experience and Competency…
iii) Informal Rule of Thumb… iv)Importance of Project….
v) Easy Understandability…. vi)Familiarity of top management with the method..

14. **Rank** the following stages of capital budgeting process in order of importance from ***1(Most Important) to 4(Least Important)***

i) Project Definition and Cash Flow Estimation ……
ii) Financial Analysis and Project Selection…….
iii) Project Implementation ……..
iv) iv)Project Review……

15. **Rank** the following stages of capital budgeting process in order of difficulty from ***1(Most Difficult) to 4(Least Difficult)***

i) Project Definition and Cash Flow Estimation…..
ii) Financial Analysis and Project Selection……..
iii) Project Implementation……..
iv) Project Review……..

16. What is the **hierarchical level of personnel** involved in taking capital budgeting decisions?

i) Lower Level Mgt……. ii) Middle Level Mgt ……
iii) Senior/Top Level Mgt ……

SECTION D: CAPITAL BUDGETING PRACTICES INCORPORATING RISK

17. Which is the highest risk stage in capital budgeting process? Rank in order from ***1(Most risky) to 4(Least Risky)***

i) Project Definition and Cash Flow Estimation……
ii) Project Implementation……
iii) Financial Analysis and Project Selection……
iv) Project Review……..

18. Which of the following do you perceive as ***'risk'*** in investment in your company?

i) Fluctuation in expected return…….
ii) Non-recoverable investment……
iii) Fear of obsolescence……..

19. How does your company rate **different sources of risk** in a particular project? ***(Ignore those which are not considered by your company)*** (NOTE: **MI**= Most Important, **I**= Important, **Can't Say**, **UI**= Unimportant, **MUI=** Most Unimportant**)**

S.NO.	**Sources of Risk**	***MI***	***I***	***Can't say***	***UI***	***MUI***
A)	Project specific risk: like quality of management, shortage of raw material ,skilled labour /infrastructure/electricity/power.					
B)	Competitive risk: affected by unanticipated actions of Competitors					
C)	Industry specific risk: unexpected technological developments ,regulatory changes, govt policy changes					
D)	Market risk: changes in macro economic factors like GDP growth rate ,fluctuations in demand, interest rate, inflation rate					
E)	International risk: in case of foreign project, earnings and cash flows may be different than expected due to exchange rate risk or political risk.					
F)	Retaining Human resources/manpower					

20. How are different **risk factors** considered in a project by your company? (***Ignore those which are not considered by your company)*** (NOTE: **MI**= Most Important, **I**= Important, **Cant Say**, **UI**= Unimportant, **MUI=** Most Unimportant**)**

S.NO.	**Risk Factors**	MI	I	Can't say	UI	MUI
A)	Commodity price risk					
B)	Risk of unexpected inflation					
C)	Company Size (small firms being riskier)					
D)	Interest rate risk (change in general level of interest					
E)	Distress risk (probability of bankruptcy)					
F)	Momentum (recent stock price performance)					
G)	Foreign exchange risk					
H)	"Market-to-book" ratio					
I)	GDP or business cycle risk					
J)	Term structure risk					

21. Which **techniques of risk analysis** are used by your company for incorporating risk in investment decisions? ***Please respond to each below.***

S.NO.	**Method**	***Never***	***Rarely***	***Sometimes***	***Often***	***Always***
A)	Calculated Bail -out factor					
B)	Probability theory					
C)	Utility Theory					
D)	Decision Tree Analysis					
E)	Hillier Model					
F)	DCF Break Even Analysis					
G)	Monte Carlo Simulation					
H)	Scenario Analysis					
I)	Sensitivity Analysis					
J)	Certainty Equivalent Approach					
K)	Conservative Estimates of Future Cash Flows					
L)	Shorter Payback Period					
M)	Risk Adjusted Discount Rate/Higher Cut Off Rates					
N)	Judgment Evaluation					
O)	No formal technique is used					

22. While valuing a project, how are the following **risk factors, adjusted** by your company? ***(Ignore those which are not considered by the company).***

S.NO.	**Risk Factors**	**Adjust Discount Rate**	**Adjust Cash Flow**	Both	**Neither**
A)	Commodity price risk				
B)	Risk of unexpected inflation				
C)	Company Size (small firms being riskier)				
D)	Interest rate risk (change in general level of interest				
E)	Distress risk (probability of bankruptcy)				
F)	Momentum (recent stock price performance)				
G)	Foreign exchange risk				
H)	"Market-to-book" ratio				
I)	GDP or business cycle risk				
J)	Term structure risk				

23. Which is the **statistical measure** most used by your company to assess risk?

i) Range r ii) Standard deviation /Coefficient of Variationr

iii) Semi-Variance r iv) Expected NPV r

24. Which of the following are the **Non-Financial criteria** used in making major investment decisions?

1. Non-financial grounds are not considered ……..
2. SWOT Analysis undertaken before acceptance …….
3. Safety of employees or the public ……..
4. Necessity of maintaining existing programmes or product lines …….
5. Customer market in case of new projects/Demand of new product ……
6. Availability of raw material, power and other basic amenities for the project …….
7. Availability of manpower for the project…….
8. Availability of Suitable Project Location……
9. Availability of Suitable technology…….
10. Need to meet competition ……
11. Country interest/Govt direction in particular area ……..
12. Environment constraints …….
13. Govt Regulation/Norms …….
14. Tax Benefit/incentive …….
15. Technical Necessity to invest ……
16. Availability of HR ……..
17. Capacity availability ……