SUMMARY
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Conclusions & suggestions for further research

Introduction

In this age of competition if we are to survive in the international sphere our most promising solution to this vital issue of our nation is to encourage and support the identification and development of various type of important personnel. One such type is the person with very high academic achievement. In future our nation cannot depend on such quality of man power but must strive to find high quality persons to deal with its vital problems. Therefore the modern educationist have a great concern rather the effectiveness, and efficiency of the teaching learning process at various levels of education. The students level of learning is in direct proportion to the academic achievement.

Academic achievement in itself is dependent on many factors the list of which is exhaustive. But for this study five factors which have the maximum contribution were taken viz Family environment, Classroom environment, Achievement motivation, Intelligence and Socio-economic status are taken.

STATEMENT OF THE PROBLEM:

"A comparative study of academic achievement: family environment, classroom environment, achievement motivation and intelligence of senior secondary students of different socio-economic groups"
OBJECTIVES

In accordance with nature of the data the present study was carried out with following objectives.

1. **Objective pertaining to descriptive analysis**
   The first objective was to study the nature of distribution of variables under study viz academic achievement, family environment, classroom environment; achievement motivation, intelligence, socio-economic status.

2. **Objectives pertaining to comparative & differential analysis**
   (a) The second major objective of the study was to compare the students of different socio-economic groups with respect to all the variables viz academic achievement, family environment, classroom environment, achievement motivation and intelligence.
   (b) To compare academic achievement, family environment, classroom environment, achievement motivation intelligence and socio-economic status of total boys with total girls.

3. **Objectives of bivariate analysis**
   The third major objective was to establish bivariate relationship between academic achievement, family environment, classroom environment, achievement motivation, intelligence socio-economic status for the total samples as well as for the sub groups based on SES.

4. **Objectives of multivariate analysis**
   The fourth objective was to find multiple regressions and multiple correlation in order to find the predictors of academic achievement from among the independent variables of family environment, classroom environment, achievement motivation, intelligence & socio-economic status.

   This analysis was done separately for the total group as well as for the sub groups of low, average & high SES groups. The purpose of this analysis was to see whether some or all of the independent variables

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exhibit any predictive efficiency of the dependent variable in this case academic achievement.

5. Objectives based on factorial analysis

The fifth objective was to factorially analyse the data in order to see configuration of the independent variables as they constellate with the dependent variable in this case academic achievement in a particular factor. It aimed to see the underlying structure of variables constellating in a particular factor.

The factor analysis was done for the total sample as well as for the three sub groups viz low, average & high.

HYPOTHESES BASED ON THE OBJECTIVES OF THE STUDY

Based on the above mentioned objectives the following research hypotheses were formulated & tested with the help of relevant statistical techniques.

1. Hypothesis related to descriptive data

(i) There exists a wide range of distribution of variables which varies from average to above average with regard to the scholastic variables like academic achievement, achievement motivation, intelligence and socio-economic background.

(ii) There also exists a wide range of perception of the students with respect to the variables of family environment, classroom environment. It is further hypothesised that all these variables fall within the range of normality of distribution.

2. Hypothesis based on comparative & differential analysis

In order to make comparisons of the various groups on the variables under study the hypotheses formulated were:

IIA Hypothesis related to the comparison of the three SES groups on variables under study.
There exists significant differences in the three sub groups of socio-economic status on the variables of academic achievement, family environment, classroom environment, achievement motivation and intelligence.

It was further hypothesized that students of the high, average, socio-economic groups have (i) higher academic achievement (ii) perceive the family environment and classroom environment in a healthy manner (iii) have higher level of achievement motivation (iv) have high level of intelligence in comparison to their counterparts from the low socio-economic status groups.

IIB Hypothesis related to sexwise comparison

It was hypothesized that the two groups of boys & girls exhibit significant differences on academic achievement; some variables of family environment; some variables of classroom environment; achievement motivation, intelligence and socio-economic status.

3. Hypothesis pertaining to bivariate analysis

The stated hypothesis was that there exists a positive significant relationship between the variables of academic achievement, family environment, classroom environment, achievement motivation, intelligence and socio-economic status of the total sample & the three subgroups viz low, average & high SES groups.

4. Hypothesis pertaining to multivariable analysis

It was hypothesized that on the basis of stepwise analysis of the multiple correlation & multiple regression coefficient of the total sample, academic achievement can best be predicted by some of the independent variables, such as intelligence, socio-economic status, achievement motivation & by some components of family & classroom environment.

(i) The research hypothesis was that each variable of family environment, classroom environment, achievement motivation, intelligence & socio-economic status contribute to the prediction of academic achievement inde-
pendently as well as conjointly with one another in case of total sample.

(ii) In case of high average & low SES groups each of the independent variables predict academic achievement both conjointly as well as in isolation, exhibiting a different set of predictors for each sub group.

5. **Hypothesis pertaining to factorial analysis**

(i) Certain dimensions of family environment & classroom environment, & the variables of achievement motivation, intelligence, SES share significant loadings constellating with academic achievement in certain factors in case of total sample & the three subgroups viz low; average & high SES groups.

(ii) There exists a different factor structure of variables in case of low, average & high socio economic groups.
error may be estimated when inferring population characteristics from observations of samples.

5. The variables & procedures are described as accurately & completely as possible so that the study can be replicated by other researchers.

Thus this study is descriptive in the sense that:

(i) It is non-experimental.

(ii) It involves formulation of hypothesis & testing.

(iii) It employs the method of randomization in (a) selection of school; (b) selection of sample.

This study is also an ex-post-facto or explanatory observational study as it seeks to find answers to questions through the analysis of variable relationships. Also an attempt was made to determine the factors associated with occurrences, outcomes, conditions, or types of behavior. Since it is often impracticable to arrange occurrences an analysis of past events may be the only feasible way to study causation.

Thus the present study is descriptive, ex post facto, explanatory study coupled with the techniques of causal - comparative relationship.

Sampling

The primary purpose of research is to discover principles that have universal application, but to study a whole population in order to arrive at generalizations would be impracticable, if not impossible. Some populations are so large that their characteristics could not be measured before the measurement had been completed the population would have changed.

Various techniques have been devised for obtaining a sample which will be representative of its population. The adequacy of a sample i.e. its
lack of bias will depend upon our knowledge of the population as well as
upon the method used in drawing the sample. Commonly used sampling
techniques are random, stratified or quota, incidental & purposive.

For this study the investigator used the method of random
sampling for the selection of the sample; a purposive sample for the
selection of school; and incidental sampling technique was used for the
selection of class.

In the present study the sample selection was done with the help
of odd-even method of randomisation keeping in view the nature of the
study, which demanded a cross section of population.

Field of investigations

Selection of schools

First of all out of a large numbers of schools i.e. Government,
Government aided & private schools, the Kendriya Vidyalayas were se­
lected because the population of these schools is fairly representative of the
social strata, as there are mostly children of the employees of central gov­
ernment, defence ( army, air force & navy ) studying in these schools.

Secondly the sample was drawn from the union territory of
Chandigarh which is the capital of Punjab & Haryana. Sample was also
taken from Ahmedabad the erstwhile capital of Gujarat state, for the simple
reason that investigator had an easy access to both the places. Thus the
technique of selection of schools was purposive in nature.

Selection of class

The field of investigation was delimitad to class XI of senior
secondary stage of the schools for the simple reason that the outgoing
DESIGN OF THE STUDY

For carrying out any kind of research it is important that first of all a design is chalked out for research.

According to Best (1963) all research involves the elements of observation, description & the analysis of what happens under certain circumstances. A rather simple three point analysis maybe used to classify educational research practically all studies fall under one, or a combination of these types.

1. Historical research
2. Descriptive research
3. Experimental research

This research study falls in the second category of research viz Descriptive research as it has certain characteristics which distinguish it from other types of research. These characteristics are:

1. They are non experimental, for they deal with the relationships between nonmanipulated variables in a natural, rather than artificial setting. Since the events or conditions have already occurred or exist, the researcher selects the relevant variables for an analysis of their relationships.

2. They involve hypothesis formulation & testing.

3. They use the logical methods of inductive - deductive reasoning to arrive at generalizations.

4. They often employ methods of randomization so that
classes i.e. X or XII were not spared by the authorities for the purpose of data collection. Thus the technique of selection of class was incidental depending on the availability of the class. Therefore this is incidental sampling.

Table 2.1

BREAK UP OF SAMPLE

<table>
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<tr>
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<th>Stu.</th>
<th>tot.stu. taken</th>
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</tr>
<tr>
<td>6</td>
<td>Kendriya Vidyalaya Airforce, A'bad.</td>
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<td>20</td>
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</tr>
</tbody>
</table>

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TOOLS USED TO COLLECT DATA

Five types of tools have been used in the study:

(1) Family environment scale (1986) for measuring family environment, by R. Moos.

(2) Classroom environment scale (1986) to study the classroom
environment of the students by R. Moos.

(3) Raven's progressive matrices (1938) was used to find out intelligence of adolescents.

(4) Deo-Mohan's achievement motivation scale (1986) was used to find out the achievement motivation of all the students.

(5) Deo Mohan socio-economic status scale (1992) was used to find out the socio-economic status of all the students.
STATISTICAL TECHNIQUES EMPLOYED TO ANALYSE THE DATA

In accordance with various objectives of the study & to test various hypotheses, various statistical techniques were employed to analyse the data.

Descriptive analysis

Means, standard deviations, SE's SK, KU were employed to study the nature of variables.

Comparitive analysis

i T-ratios were employed to compare the different socio-economic groups on all the variables viz academic achievement, variables of family environment; variables of classroom environment, achievement motivation & intelligence.

ii To compare total boys & total girls on the variables of family environment, classroom environment, achievement motivation, intelligence & socio-economic status.

iii To compare the student samples of both Chandigarh & Ahmedabad on all the variables viz academic achievement, variables of family environment, variables of classroom environment, achievement motivation & intelligence.

Bivariate analysis

Co-efficients of correlations were employed to study the nature & degree of relationship between the variables under study.

Multivariate Analysis

Stepwise multiple regression & multiple correlations were worked out to find the predictors of academic achievement.
Factor Analysis

factor analysis was done to study the constellation of variables, and structure of variables under different canopies of factors keeping in view the dependent variable viz achievement & its constellation with independent variables of family environment, variables of classroom environment, achievement motivation & intelligence.
MAIN FINDINGS OF THE STUDY

Section I

Conclusion based on descriptive analysis

(vide table 3.1.1)

The objective of this analysis was to study the nature & distribution of variables under study viz academic achievement, family environment, classroom environment, achievement motivation, intelligence & socio economic status.

The hypotheses tested were that:

(i) There exists a wide range of distribution of variables; which varies from average to above average with regard to the scholastic variables like academic achievement, achievement motivation, intelligence & also the socio economic background.

(ii) There also exists a wide range of perception of the students with respect to the variables of family environment & classroom environment. It was further hypothesised that all these variables fall within the range of normality of distribution.

Conclusions based on descriptive results (Total sample table 3.1.1)

In the present study based on the discussion of the means & S.D,s on scholastic variables like academic achievement, achievement motivation, intelligence it was observed that there was a wide range of distribution of variables which varied from average to above average as under:

(i) Academic achievement was found to be 50th percentile

(ii) Also a wide range of perception of the students was observed with respect to variables of family environment and classroom environment.

(iii) Achievement motivation was found to fall on the 50th percentile.

This means children had only average motivation.
(iv) Intelligence came out to be 50th percentile according to the S.P.M norms.
(v) Regarding the SES, the results indicate average SES background for the total sample. This also gives support to the hypothesis.

Section II

Conclusions based on comparative & differential analysis i.e. conclusion based on t-ratios:

IIA Conclusions on the comparison of students of three different SES groups on all variables under study

The objectives of this study were to compare students of different SES groups with respect to all the variables viz academic achievement, family environment, classroom environment, achievement motivation & intelligence.

In order to make comparisons of the various SES groups on the variables under study the hypothesis formulated was:

There exist significant differences in the three subgroups of SES on the variables of academic achievement, family environment, classroom environment, achievement motivation & intelligence.

It was further hypothesised that students of the high & average SES groups have (i) higher academic achievement (ii) perceive the family environment & classroom environment in a healthy manner. (iii) have a high level of achievement motivation (iv) have a high level of intelligence in comparison to their counterparts from low socio-economic status group.

Based on the discussion vide table 3.2.1 on the comparison of all the three groups viz. low, average & high it was concluded that the

(i) Children from high & average SES groups had higher academic achievement as compared to children from low SES groups.
(ii) On comparison of all the three groups viz. low, average & high
it on the variables of family environment & classroom environment it was concluded that the children from high & average SES group percieved the family environment i.e. healthy relations & classroom environment in a better manner as compared to the low SES group.

(iii) Further on comparision of the three groups viz. low; average & high on achievement motivation it was observed that the students from high & average families had higher achievement motivation than children of low SES groups.

(iv) Also on comparision of the three groups low; average & high on intelligence it was observed that the students from high & average SES groups has higher level of intelligence than the students of low SES groups.

IIB Conclusions on sexwise comparison

The objective of this analysis was to compare academic achievement, family environment; classroom environment; achievement motivation, intelligence & socio-economic status of total boys & total girls.

It was hypothesised that the two groups of boys & girls exhibit significant differences on academic achievement, some variables of family environment, some variables of classroom environment, achievement motivation, intelligence & socio-economic status.

On comparision of the two groups viz. boys & girls of the total group it was observed that there were significant differences on both the groups on all the variables under study & that the girls had higher academic achievement, percieved the family environment & classroom environment in a better manner than the boys. Further they had higher achievement motivation; higher intelligence & came from families with better SE background than boys.

The hypothesis got support as there were significant differences
between the two groups on nearly all the variables

**Section III**

**Conclusions based on bivariate analysis i.e. Product Moment Co-efficients of correlations.**

(Vide tables 3.3.1 through 3.3.4)

The major objective of this study was to establish bivariate relationship between academic achievement, family environment, classroom environment, achievement motivation, intelligence, socio-economic status for the total samples as well as for the sub groups based on SES.

The stated hypothesis was that there exists a positive significant relationship between the variables of academic achievement, family environment, classroom environment, achievement motivation, intelligence & socio-economic status of the total sample & the three sub groups viz. low, average & high.

It was observed vide table (3.3.1) that there existed positive & significant relation between academic achievement & some of the variables of the family environment namely inter cultural orientation $V_7$, and organisation $V_{10}$, same variables of classroom environment viz. involvement $V_{12}$, task orientation $V_{13}$, competition $V_{16}$; order & organisation $V_{17}$ & teacher $V_{19}$ control. and the variables of achievement motivation, intelligence & the SES for the total sample.

A similar pattern was observed for both high & average SES groups i.e. positive & significant relationship was observed between academic achievement & some of the variables of family environment some variables of classroom environment; achievement motivation & intelligence.

In case of the low SES group positive and significant relationship was observed between academic achievement & the variables of family environment but a negative & significant relationship was observed with some
of the variables of classroom environment; there was a positive significant relationship between academic achievement; & achievement motivation & intelligence.

The hypothesis that there exists a positive significant relationship & academic achievement the variables of family environment; classroom environment; achievement; inter & SES found full support in case of total sample; high SES groups & average SES.

In case of low SES group it got further support in case of the variables of family environment; ach-mot & intelligence but was contradicted in case of variables of classroom environment.

**Section IV**

**Conclusion based on step wise multiple correlations & regression analysis. (Vide tables 3.4.1 to 3.4.4)**

The objectives of this analysis was to find the predictions of academic achievement from among the independent variables of family environment; classroom environment, achievement motivation; intelligence & Socio economic status.

This analysis was done separately for the total group as well as for the sub groups of low, average & high SES groups. The purpose of this analysis was to see whether some or all the participant variables exhibit any predictive efficiency of the dependent variable in this case academic achievement.

It was hypothesised that on the stepwise analysis of the multiple correlation & multiple regression coefficient of the total sample academic achievement can best be predicted by some of the independent variables, such as intelligence; socio economic status; achievement motivation & by some components of family & classroom environment.

In case of High SES group academic achievement & predicted significantly by same variables of family env.
ronment, classroom environment, achievement motivation & intelligence; SES contribute to the prediction of academic achievement independently as well as conjointly with one another in case of total sample.

(ii) In case of high average & low SES groups each of the independent variables predict academic achievement both conjointly as well as in isolation exhibiting a different set of predictors for each sub group.

In accordance with this objective stepwise multiple regression co-efficient & multiple correlations were computed separately for the total sample & the three sub groups.

In case of all the four groups a different set of predictors was obtained.

**For the total sample vide Table 3.4.1**

Out of the 22 independent variables; 9 variables came out to be significant predictors. These are in the order; intelligence; socio economic status, order & organization; achievement motivation, competition, innovation, organization & achievement orientation. Out of which, order and organization, competition & innovation are the variables of classroom environment; and organization and achievement orientation are variables of family environment.

These findings gives full support to the hypothesis relating to intelligence, socio economic status, achievement motivation as the predictors of academic achievement. It also partially supported the hypothesis related to the family environment and classroom environment. Organization and achievement orientation out of the family environment variables & organization, competition & innovation out of the variables of the classroom environment came out to be the significant predictors of academic achievement.

**For the low SES group vide Table 3.4.2**
Thus from among the 22 predictors, 12 variables came out to be significant. These are in order as intelligence, competition a variable of classroom environment, inter cultural orientation a variable of family environment, innovation, teacher control, task orientation all variables of classroom environment, control a variable of family environment, achievement motivation, active recreational orientation, independence and moral religious emphasis all three being variables of family environment.

These findings give full support to the hypothesis relating to intelligence, achievement motivation as the predictors of academic achievement. Hypothesis is also partially supported relating to the variables of the family environment and classroom environment. Out of the variables of family environment inter cultural orientation; control; act rect orientation, including, moral & religious emphasis. Out of the classroom environment competition; innovation, teacher support, task orientation came out to be the significant predictors of academic achievement.

**For average SES group table 3.4.3**

Out of the 22 predictors of academic achievement 10 predictors came out to be significant. These are in the order as intelligence; order & organisation a variable of classroom environment, achievement orientation a variable of family environment, innovation, a variable of classroom environment, organisation; independence variables of family environment, socio economic status & intercultural orientation another variable of family environment.

These findings give full support to the hypothesis relating to intelligence & socio-economic status.

This hypothesis is partly supported in case of the variables of family environment orientation, conflict, organisation, independence & intercultural orientation were found to be significant predictors of academic achievement. Out
organisation, & innovation came out to be the significant predictor of academic achievement.

**Conclusions on High SES group table 3.4.4**

Out of the 22 predictors of academic achievement 8 predictors came out to be significant. These are in the order of intelligence; rule clarity a variable of classroom environment; cohesion; variable of family environment; competition & involvement variables of classroom environment & intercultural orientation a variable of family environment; achievement motivation & achievement orientation a variable of family environment.

These findings give full support to the hypothesis pertaining to intelligence & achievement motivation.

The hypothesis is partially supported with respect to family environment & classroom environment as only few variables of family environment are predictors of academic achievement; these are cohesion; intercultural orientation & achievement orientation. In case of classroom environment they are rule clarity; competition & innovation.

**Section V**

**Conclusion based of factor analysis**

*Vide tables 5.5.1 to 5.5.8*

The objective was to factorially analyse the data in order to see the configuration of the independent variables as they constellate with the dependent variable (in this case academic achievement) in a particular factor. It aimed to see the underlying structure of variables constellating in a particular factor.

The factor analysis was done for the total sample as well as for the three sub groups.

(i) The hypothesis pertaining to factorial analysis was that certain
dimensions of family environment & classroom environment & the variables of achievement & intelligence, socio economic status share significant loadings constellating with academic achievement in certain factors in case of total sample & the three subgroups.

(ii) There exists a different factor structure of variables in case of high, average & low SES groups.

**Factor Analysis conclusion on Table 5.5.2 of Total sample**

**Factor I**

A close observation on this factor revealed that:

(i) Academic achievement is constellating with cohesion ($V_1$), expressiveness ($V_3$) from among the relationship dimension of family environment.

(ii) From among the classroom environment no variables constellate with academic achievement.

(iii) Achievement motivation, intelligence & socio economic status all constellate with academic achievement in factor I.

Therefore on the basis of the above results the stated hypothesis that certain variables of family environment, classroom environment, achievement motivation, intelligence & socio economic status got full support in case of variables of family environment, achievement motivation, intelligence & socio economic status only in case of classroom environment no significant loadings were observed on any variable.

**Factor analysis of low SES group**

**Conclusion on Table 5.5.4**

**Factor I**

A close observation on this factor revealed that:

(i) Academic achievement is constellating with cohesion ($V_1$) out of the
relationship dimension of family environment independence (V₅) active recreational orientation (V₆) out of the personal growth dimension of family environment.

(ii) Academic achievement also constellated with order & organisation (V₁₉) out of the system maintenance dimension of classroom environment.

(iii) Academic achievement also constellated with achievement motivation (V₂₁) & intelligence (V₂₂) in this factor.

These findings full support to the hypothesis pertaining of achievement motivation & intelligence but partial support to the family environment & classroom environment as only some variables of these two scales constellated with academic achievement.

**Factor VII**

A close observation on this factor revealed:

(i) that academic achievement is constellating with inter-cultural orientation (V₆), & active recreational orientation (V₆) out of the personal growth dimension of family environment.

(ii) Out of the classroom environment variables affiliation (V₁₃) out of the relationship dimension of classroom environment & task orientation (V₁₅) out of the personal growth dimension of classroom environment constellated with academic achievement.

(iii) Academic achievement constellated with intelligence (V₂₂) & socio economic status (V₂₃).

The hypothesis pertaining to intelligence, achievement motivation & socio economic status got full support under the two factors i.e. Factor I & Factor VII.

The hypothesis was partially supported in both the cases i.e. factor I & factor VII for the variables of family environment & classroom
environment as only a few variables out of the two scales constellated with academic achievement.

**Factor analysis of average socio economic status group**

**Conclusion on Table 3.5.6**

**Factor I**

A close observation on this factor showed that:

(i) Academic achievement constellated with cohesion ($V_2$) out of the relationship dimensions; inter-cultural orientation out of the personal growth dimension of family environment.

(ii) Academic achievement also constellated with teacher support ($V_{13}$) out of the relationship dimension of classroom environment.

(iii) Academic achievement also constellated with intelligence ($V_{22}$) & socio economic status ($V_{23}$).

The hypothesis pertaining to intelligence & socio-economic status got full support but got a partial support in case of family environment & classroom environment as only some variables of these scales constellated with academic achievement.

**Factor analysis of high SES group**

**Conclusions on Table 3.5.8**

**Factor I**

A close observation on this factor revealed that:

(i) Academic achievement constellated with cohesion from the relationship dimension, achievement orientation, inter cultural orientation, active recreational orientation from among the personal growth dimensions of family environment.

(ii) Out of the variables of classroom environment, involvement, order & organisation from the relationship dimension and system maintenance respec-
(iii) Out of the cognitive variables achievement motivation constellated with academic achievement.

**Factor VI**

Close observation of this factor revealed that

(i) Out of the variables of family environment, expressiveness, intercultural orientation & active recreational orientation, control constellated with academic achievement.

(ii) Affiliation was the only variable from among the variables of classroom environment which constellated with academic achievement.

(iii) Out of the cognitive variables intelligence constellated with academic achievement under this factor.

On the basis of factor analysis the stated hypothesis that certain variables of family environment, classroom environment, variables like achievement motivation and intelligence constellate with academic achievement got full support and hence proven and accepted.
Further Suggestions for research

The investigator delimited the study by taking variables like family environment; classroom environment; intelligence; achievement motivation & socio economic status. This research could be carried out by taking other variables like self esteem; anxiety; self concept; locus of control etc.

This research was carried out in Kendriya Vidyalayas but it could be carried out in private schools; public schools; or Govt. aided schools etc.

This research was carried out on higher secondary students it could be extended to college going students, or even to primary students.

This research could also be separately carried out on normal families; single parent families, divorced or seperated parent families; on children living in hostels etc.

The research was delimited only to the urban areas it could be extended to the rural areas as well, where variables such as working conditions for children; number of hours the children put in for study; the number of hours electricity was available and many other factors.

This study can be made as exhaustive as possible by taking more number of variables.