

IMPACT OF DEMOGRAPHIC VARIABLES ON INDIRECT EQUITY INVESTMENT: AN EMPIRICAL STUDY

Dr. Ranjit Singh and
Dr. Dibyajyoti Bhattacharjee

Dr. Ranjit Singh is Assistant Professor, (ranjitsingh13@gmail.com) and
Dr. Dibyajyoti Bhattacharjee (dibajyoti.bhattacharjee@gmail.com) is Reader, at the Department of Business
Administration, Assam University (A Central University), Silchar (Assam)

Abstract

The objective of the present study is to find out the impact of demographic variables on the indirect equity investment decisions of the employees. The study is done on the employees of Oil India Limited [OIL]. It is found that out of the four demographic variables namely age, gender, qualification and designation considered for the study only Age and Designation have association with the indirect equity investment in past, none of the demographic variables have association with the indirect equity investment in present and gender and qualification have significant association with the indirect equity investment in future.

Key Words: Indirect Equity Investment, Demographic Variables, Oil India Limited [OIL]

Introduction

There are two ways of making investment in equity shares. One way is to open up a demat account with a depository and invest in equity shares through this account. This mode of investment in equity share is referred to here as 'Direct Equity Investment'. Another way to invest one's money into equity is to invest in mutual funds and unit linked insurance policies. This money is also invested into the equity shares but the decision to make the investment is made by the fund managers of the respective mutual fund companies or the insurance companies and the concerned investor do not have any control over the investment to be made in equity shares by the fund managers. Here the fund managers decide about the securities in which then investment is to be made or the securities where the investment is not to be made. This kind of equity investment is referred here as '**Indirect Equity Investment**'.

While making the investment decision and especially equity share investment decisions, not only conscious or explicit information plays a role, but also implicit or

unconscious components like psychological, sociological, economical, psychological factors are considered to be important (Shiller R., 2005). The existing theories in the traditional economics and financial management are seriously challenged when it cannot satisfactorily answer important policy questions of the day (Kahneman and Tversky, 1979). It also cannot explain other types of micro-behaviour, such as saving behaviour or investment behaviour.

Now-a-days, with the opening up of the economy and development of capital market, which is evident from the increasing number of branches of the stock broking house in the small and medium towns of India, the awareness about the investment in equity shares have increased among the people. In this regard, the role of SEBI is also worth mentioning in imparting the investment education among the masses (www.sebi.gov.in). It is also reflected in the increased number of de-mat account holders in the country which is more than 1 crore as of now (www.nsdl.co.in).

Review of Existing Literature

Bergman N. K. and Jenter D. (2003) conducted a study on the employees of an organisation, it was found that there are enough evidences that people want to invest in those companies with which they are familiar with. Barberis N., Shleifer A. and Vishny R. (1997), did a study of equity share investment behaviour and their findings are throwing more light on why, when and how people buy or sell the stocks they do - and even why, when and how they do not buy stocks at all. Ackert L., Church B. K. and Englis B., (2002), investigate whether asset allocation decisions vary for respondents who differ across several dimensions including gender, home ownership, age, net worth, and psychological orientation. It is found that only age affects the mix of risky securities that is the equity shares. Higgins M. (1998) finds that youth and old-age dependency ratios are associated with lower savings rate. Tokuo Iwaisako (Iwaisako T., 1995) did an extensive study on household portfolio in Japan. It is found that equity shares in financial wealth increases with age among young households, peaking in the fifties age group, then becoming constant. This peak comes in a much later stage of the life-cycle compared to other countries. Stock market participation varies in a way very similar to unconditional equity shares, while equity shares conditional on ownership exhibit no significant age-related pattern. This implies the age-related patterns are mostly explained by the decision to hold or not to hold stocks at all.

Elke U., Ann-Renée Blais, Nancy E. (1998) in the *Journal of Behavioural Decision Making* says that Peoples' degree of risk taking was highly domain-specific. Women appeared to be more risk-averse in all domains except social risk. In gender effects on employees participation and investment behaviour with 401(k) retirement plans Balkin D. (2004) is of the view that women are more risk averse than men in making asset allocations with their retirement plans,

which is consistent with economic theory predictions. Males were observed to make larger savings contributions to their retirement plans than females, counter to the predictions of life-cycle theory. No gender differences were observed in levels of employee participation to the defined contribution retirement plans. In another study related to the gender perception and response to investment risk it is found that women investors' weight risk attributes, such as possibility of loss and ambiguity, more heavily than their male colleagues. In addition, women tend to emphasize risk reduction more than men in portfolio construction. While gender differences appear to influence perceptions of risk and recommendations to clients, these differences tend to be the most significant for assets and portfolios at risk extremes (Robert A., 2001).

Poh Kam W. & Yuen Ping H., (2007) in a study found that investing propensity in Singapore is less influenced by demographic factors and income, and more by prior entrepreneurial experience and self-perceived skills with new business formation.

From the above it is evident that there have been several studies to test the impact of demographic variables on equity share investment. But in this regard there is dearth of research in Indian context. Secondly, all these studies were done to test the impact of demographic variables on direct equity investment. Therefore, there is research gap with regard to the impact of demographic variable on indirect equity investment.

Reason for Choosing Salaried Investors

The equity investment behaviour of the salaried investors from the public sector undertakings [PSU] requires special mention. The employees of PSUs are drawing handsome salary which is also evident from the salary structure for the employees of these companies. It is established law in economics that income of

a person determines his/her savings and savings determines his/her investment. Naturally, the employees of PSUs because of their relatively higher income are expected to invest more. Due to the developments in the capital markets and increased awareness about the equity investment, a significant part of their investment is expected to go to the equity or equity related products like mutual funds and unit linked insurance policies. Disinvestments of shares of PSUs like Indian Oil Corporation Limited, ONGC Limited, Oil India Limited etc and giving stock option plan to the employees of these PSUs have also given another option to them to invest in the equity shares of the companies where they work as well as the companies where they do not work.

Reason for Choosing Indirect Equity Investment

In a study done by Singh, R. (forthcoming), it was found that there is clear cut preference for the 'indirect equity investment' than the direct equity investment. So, it would be an interesting area of research to find out whether the demographic variables have an impact on the indirect equity investment or not? Moreover, from the review of literature it is ascertained that there is lack of adequate studies to find out the impact of demographic variables on indirect equity investment.

Methodology of the Study

The study is empirical in nature. The employees of Oil India Limited [OIL] have been considered as case for this purpose. The Study was done during the time period of 1st April, 2007 to 31st October, 2007. The study is restricted only to find out the influence of four identified demographic variables namely, age, gender, designation and qualification on the indirect equity investment of the employees of OIL. Here only indirect equity investment made by the employees of OIL is considered and direct equity investment is not considered for the study.

Objective

The objective of this paper is to identify the impact of demographic variables on the indirect equity shares investment of the employees.

Hypothesis of the Study

Based on the above review of literature and discussions the hypothesis considered for the study is given as follows:

H₀₁: There is no significant association between 'age' and indirect equity investment of the employees.

H₀₂: There is no significant association between 'gender' and indirect equity investment of the employees.

H₀₃: There is no significant association between 'designation' and indirect equity investment of the employees.

H₀₄: There is no significant association between 'qualification' and indirect equity investment of the employees.

Universe of the Study

All the employees' working in OIL at Duliajan Head Office (i.e. Executives, Non-Executives) constituted the universe of the study. The size of the universe was 8480.

Sampling Scheme and Sample Size

Here each employee was considered as the unit of the study. Sample selection was based on simple random sampling basis. Considering the time and resources constraints, a sample size of only 378 employees were finally selected. With the given sample the result would be obtained with 95% confidence level and 2.1% confidence interval.

Questionnaire Design

The prepared questionnaire dealt with the

investment of the employees of OIL in the equity shares made indirectly through mutual funds and unit linked insurance policies. The questions asked were about their indirect investment in equity shares in the past, whether they are still holding these securities [i.e., present investment] and whether they have decided to invest in future also through this route. Demographic information like age, gender, designation and qualification is also collected through the questionnaire. The questionnaire given to the respondent was a close ended questionnaire. The age related data is collected in the interval of 20-30 years, 30-40 years, 40-50 years and more than 50 years. For designation, information is collected for officers and non-officers and for qualification, the options given to the respondents were upto 10th, Graduate, Post Graduate and Others/Professional.

Method of Data Analysis and Interpretation

The raw data collected through the questionnaire were scrutinized and were re-collected in some cases. The raw data were loaded into SPSS and were tabulated using two way and multi-way tables. The logistic regression model proposed by Kleinbaum and Klein (2002) has been used for indentifying the demographic variables significant for indirect equity investment decisions.

Analysis and Findings

Let Y be the response variable, which is dichotomous variable providing information about the respondent's indirect investment in equity shares,

Where

$$Y = \begin{cases} 0, & \text{never invested indirectly in equity shares in past,} \\ 1, & \text{Invested in indirectly in equity shares in past.} \end{cases}$$

Then

$$P(Y=1) = 1 - P(Y=0)$$

Here $P(Y=1)$ must lie between 0 and 1, but predicted value may be less than 0 or greater than 1.

Thus the probability that a person has indirect investment in equity shares in past is given by

$$P(Y=1) = \frac{\exp(a + b_1x_1 + b_2x_2 + b_3x_3)}{1 + \exp(a + b_1x_1 + b_2x_2 + b_3x_3)}$$

More conveniently it can be written as

$$P(Y=1) = P(Y=1|(X_1+X_2+X_3)) = P(X),$$

Where $X=(\text{Age, Gender, Designation, Qualification})$ are the covariates (explanatory variables) of the binomial regression.

Thus,

$$\text{Logit } P(X) = a + b_1 \text{ Age} + b_2 \text{ Gender} + b_3 \text{ Designation} + b_4 \text{ Qualification}$$

However, it is noted that here all the covariates are categorical variables like, Age - 20-30, 30-40, 40-50 and more than 50 years which are being coded as 1, 2, 3 and 4 respectively, Gender is coded as 1 for male and 2 for female, coding for Qualification is done as 1 for 'Upto 10th level', 2 for upto graduate level, 3 for upto PG level, and 4 for Professional qualifications. The other variable Designation was coded as 1 and 2 for Officer and Non officer respectively. The Odds Ratio from Binary Regression Showing Effects of Indirect Equity Investment in Past with the Demographic Variables is shown in table 1. In this table the reference variable are taken as follows: Age-50 and above; Gender - Female; Designation-Non-officer, Qualification-Professional.

Table 1: Odds Ratio from Binary Regression Showing Effects of Indirect Equity Investment in Past with the Demographic Variables

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Age			7.806	3	.050	
Age(20 30)	-.463	.657	.497	1	.481	.629
Age(30 40)	.640	.417	2.361	1	.124	1.897
Age(40 50)	.814	.358	5.173	1	.023	2.256
Gender(Male)	-.175	.425	.170	1	.680	.839
Designation(Officer)	.747	.301	6.150	1	.013	2.110
Qualification			2.744	3	.433	
Qualification(10th)	-1.154	.763	2.288	1	.130	.315
Qualification(Grad)	-.832	.662	1.580	1	.209	.435
Qualification(PG)	-.520	.750	.481	1	.488	.595
Constant	1.435	.843	2.900	1	.089	4.199

Source: compiled from Questionnaire

However, the Cox and Snell R² value for the fitted binomial logistic regression is only 0.049 which does not indicate a good fit. However, the Wald statistic in the above table indicates that Age and Designation are the two variables that are significant variables in the indirect equity investment decisions. Though from the Exp(B) column there is an indication that compared to people of age more than 50 years the people

in the age group of 40 - 50 years are more than twice as likely to invest indirectly in equity shares. Similar comment can also be made about the officers who are more than twice as likely to invest indirectly in equity shares, compared to the non officers.

Similar computations were also done for the present and future indirect investment plans. The results are as follows:

Table 2: Odds Ratio from Binary Regression Showing Effects of Indirect Equity Investment in Present with the Demographic Variables

Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Age			7.320	3	.062	
Age(20 30)	-.035	.648	.003	1	.956	.965
Age(30 40)	.911	.396	5.297	1	.021	2.486
Age(40 50)	.726	.326	4.946	1	.026	2.067
Gender(Male)	.302	.373	.656	1	.418	1.352
Designation(Officer)	.472	.271	3.034	1	.082	1.604
Qualification			6.858	3	.077	
Qualification(10th)	-1.378	.747	3.404	1	.065	.252
Qualification(Grad)	-1.278	.647	3.899	1	.048	.279
Qualification(PG)	-.507	.740	.470	1	.493	.602
Constant	1.105	.794	1.936	1	.164	3.018

Source: Compiled from Questionnaire

Reference variable: Age - 50 and above;
Gender - Female; Designation- Non officer,
Qualification Professional.

The Cox and Snell R^2 value for the fitted
binomial logistic regression is 0.06 which

indicates a better fit than the previous case.
The Wald statistic, in the above table
indicates that none of the variables play a
significant role in shaping the indirect equity
investment decisions.

Table 3: Odds Ratio from Binary Regression Showing Effects of Indirect Equity Investment in Future with the Demographic Variables

	B	S.E.	Wald	df	Sig.	Exp(B)
Age			4.406	3	.221	
Age(20-30)	.733	.841	.760	1	.383	2.082
Age(30-40)	.900	.435	4.282	1	.039	2.460
Age(40-50)	.484	.354	1.868	1	.172	1.623
Gender(Male)	.995	.370	7.226	1	.007	2.704
Designation(Officer)	.271	.293	.851	1	.356	1.311
Qualification			6.748	3	.080	
Qualification(10th)	-1.992	.850	5.492	1	.019	.136
Qualification(Grad)	-1.209	.768	2.481	1	.115	.298
Qualification(PG)	-1.047	.829	1.595	1	.207	.351
Constant	1.105	.893	1.531	1	.216	3.018

Source: Compiled from Questionnaire

Reference variable: Age - 50 and above;
Gender - Female; Designation- Non officer,
Qualification Professional.

The Cox and Snell R^2 value for the fitted
binomial logistic regression is 0.051 which
indicates a better fit than the Past case. The
Wald statistic, in the above table indicates
that Gender and Qualification of the
variables play significant roles in shaping
the indirect equity investment decisions in
future. From the Exp(B) column there is an
indication that males are 2.7 times as likely
to invest indirectly in equity as compared to
their female counterparts. Also the
professionally qualified people have much
more chance of investing indirectly in
equities than people with other
qualifications.

Conclusion and Policy Implications

The objective of this paper was to identify the
impact of demographic variables on the
indirect equity investment of the employees
of OIL. It is found that in the past only Age
and Designation have association with the
indirect equity investment. Ackert L., Church
B. K. and Englis B., (2002) also in their study
found that age is having significant impact
on the equity investment decisions of the
investors. In the present, none of the
demographic variables considered for the
study is found to have significant impact on
indirect equity investment. In the future,
Gender and Qualification are the two
demographic variables which are found to
have significant impact on indirect equity
investment. Thus, it is established that all the
demographic variables do not have
significant association with the indirect

equity investment. So, a question arises regarding the factors which affect the indirect equity investment decision of the investors as the demographic variables are not significant. In an earlier study it was found that the risk perception of the investors' as well as the knowledge and skill to manage and handle risk, have an impact on the investment behaviour (Singh R. & Bhowal A., 2009). It is also established that the past experience of the investors' with the investment in equity shares have significant influence on the equity share investment behaviour (Singh R. and Barman A., 2009). So, it can be concluded that risk perception along with the knowledge and skill to handle and manage risk and the past experience of the investors' have influence on the indirect equity investment decisions of the employees and the demographic variables do not have significant impact on their investment decisions. Therefore, the investment culture can be improved by imparting the potential investors' with the knowledge and skill to handle and manage risk.

Limitations and Further Research Directions

In the present study the income of the respondents have not been considered to ascertain its impact on indirect equity investment as it is found that most of the people do not want to disclose their income. In future a study can be undertaken to find out the impact of income on the equity share investment. The study calls for similar such developments, comparing the impact of demographic variables on direct equity investment and indirect equity investment.

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