EDITORIAL

We are glad to publish Volume 9 Number 2 of Arth Anvesan, a Bi Annual Refereed Journal from Faculty of Management, Shri Mata Vaishno Devi University. Our objective of publishing the journal is to add value to the academic field of Management and Economics. We hope this volume would lend new insight and provide unmarked concepts in the said areas. Our sincere thanks to the referees, authors and all others who directly or in many other ways, contributed to the publication of this volume.

Six research papers, have been chosen for publication in the present volume of Arth Anvesan. The first paper by Sabina Laskar, Piyali Tripathy and Bikash Ranjan Mishra explores the determinants of Trade and FDI flows in the BRICS countries. Gravity Model is used in the Panel data set-up. The results of their study reveal that the bilateral trade and FDI flows are positively linked with the market size and negatively with the distance between the pair countries. The next article by Sunil Kumar Arora attempts to investigate the factors inducing customer participation in internet enabledB2C E-markets. The study identified some factors which influence the customer decision to buy goods and services from the online shopping. The study by Pabitra Kumar Jena and D.S.Hegde investigates impact of Indian FDI inflows on productivity during pre and post Globalization period. The study observed varied results depending on the characteristics of the host country and the investing firms. The objective of the subsequent paper by Sunita Sukhija and Arti Gaur is to study the Comparative impact of Recession on Determinants of Stock Prices of BSE Listed Companies. The Fixed Effects model and Random Effects models have been employed to investigate the objective. An Empirical Study by Bimal Jaiswal and Noor Us Saba on the Perception and Expectation of Customers for IT Enabled Banking Services highlighted that in the post liberalization era of competition and rivalry, information technology has become the support of any business and so the information becomes its heart, which helps in gaining competitive edge, and the penetrating effect of information technology in collecting, combining and processing large volumes of information is ultimate. The concluding paper on Portfolio Optimization by Falguni H. Pandya aims to achieve asset mix which offers highest expected return at a given level of risk. For that, selection of right securities, their right proportion with each other with respect to their correlations plays major role to achieve certain return and/or reduce risk.

We look forward for the original and quality research work for publishing in Arth Anvesan. Specifically we incorporate research articles, case studies, book reviews in the areas of Finance, Human Resource, Marketing, Supply Chain, Economics and any other related subject following the double blind peer reviewed method.

Kakali Majumdar

CONTENTS

Determinants of Trade and FDI flows in the BRICS countries - Evidences from Gravity Model Analysis

Sabina Laskar[*], Piyali Tripathy[**] and Bikash Ranjan Mishra[***]

Abstract

In the contemporary days, some of the key developing countries like; Brazil, Russia, India, China andSouth Africa (BRICS) have been emerging as major destinations for Foreign Direct Investment (FDI) inflows and Trade inflows. The present study focuses on the factors responsible for trade and FDI flows in the BRICS countries using recent annual dataset from the period 2008 to 2012. The main objective of this research is to evaluate the determinants of Trade and FDI flows in the BRICS using the Gravity Model. A Panel data set-up is constructed and used to estimate the determinants and evaluate the empirical results. There are two-fold dependent variables in the present study, such as: Trade and FDI flows. Both are analyzed independently in two different sections. The independent variables are Gross Domestic Product (GDP), GDP growth rate, distance between host and source countries, commonness in terms of language and border between the pair of countries and population of the host country. The results reveal that the bilateral trade and FDI flows are positively linked with the market size and negatively with the distance between the pair countries.
Keywords: Trade, FDI,Gravity Model, Market size, Distance.

Introduction

Trade appears to have played a significant role in boosting the economic growth prospects of the BRICS countries. There is evidence to suggest that trade liberalisation has been seen and used as a tool for promoting economic growth and facilitating development in all the BRIC's countries. Infact Trade and FDI continue to be the two major drivers of BRICS economies. The increase in direct investment flows has laid to the foundation for a dramatic expansion of international trade and production by transnational corporations. While FDI represents investment in production facilities, its importance for developing nations is much greater as it adds to the nation's capital stock and promotes capital formation. Foreign Direct Investment (FDI) in emerging economies has been phenomenal and has contributed to the overall economic growth of a country. According to the World Investment Report (2011), emerging economies together attracted more than half of global FDI inflows in the year 2010. As international consumption and international production has been shifted to emerging economies, MNCs are increasingly investing in both efficiency-seeking and market-seeking projects in these emerging countries.

In addition, FDI plays a significant role leading to long-term competitiveness and sustainable growth of the host countries. There are evidences of reports and articlesabout the Trade flows in the BRICS countries, which is the main factor in stimulating a nation's economic growth. From a recent statistics, it has been found that, Russia and China remain the most export oriented among the other member nations, followed by South Africa, India and Brazil.

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China has now become the leading exporting country in the world dominating Germany (2nd) and US (3rd). Apart from China, Russia ranked 8[th]in the world with exports amounting to \$536bn – is the only other BRICS country high on the list of top exporters. Now the main aim is to track whether the pattern and trends in bilateral and intra-regional trade of the BRICS economies are identical or whether they have varied in a wider sense till date.BRICS countries are becoming increasingly attractive destinations from the past few decades. A paper by Goldman Sach's in 2003 – Dreaming with BRICS: The path to 2050 predicted thatoverthe next 50 years, the BRICS could become a major force in the world economy.

The following predictions were supported by the emerging dynamics over the last decade. It is seen that with share of a little over 10% in the world GDP and less than 4% in the world trade (1990), BRICS (with inclusion of South Africa) now accounts for 25% of the world GDP and 15% of the world trade. One noteworthy fact is that after this period, from the year 1996 the export flows of China is seen to be dominating the growth process of Russia, India, Brazil and South Africa, evenChina has the strongest growth rate followed by India, Russia, Brazil andSouth Africa in theperiod between 1980-2014. Theincrease in FDI inflows led the economies of South Africa receive the highest amount of capital inflows between the period from 1980-2014. This will lead to an increase in global competition among the rest of the world with the BRICS.By 2014 South Africa gains the highest amount of FDI outflows dominating the economies of Russia, India, China and Brazil.

There are various empirical studies which show that there is positive relationship between FDI and Economic Growth and FDI is a key component of the world's growth engine, hence countries try to create favourable conditions to attract more FDI inflow into their economies. (Adhikary 2011; Bhavan et.al 2011; Azam 2010). FDI not only raises the level of investment or capital stock but increases employment by creating new production capacity and jobs; transfer intangible assets such as technology and managerial skills to the host country and provide a source of new technologies, processes, products, organizational technologies and management skills, Backward and Forward linkages with the rest of the economy (Ho and Rashid 2011).

Literature Review

The relationship between FDI and Economic growth in the five most emerging economies namely Brazil, India, Russia, China and South Africa over the period 1989-2012 is shown by a panel data analysis constructed to analyse the FDI flows that led to growth in the emerging economies. In order to analyse the FDI led growth hypothesis three following steps were performed: (a) test for stationarity or the order of integration, (b) test for integration and (c) test for direction of causality.Studies suggests that FDI and economic growth share long run relationships or are integrated in long run at group (panel) level as confirmed through Pedroni's panel cointegration test results. Hence, economic growth is likely to attract more FDI inflowsand enhance foreign investments (*Agarwal* 2015).

As far as the overall trend of the inward FDI in the BRICs is increasing. Nevertheless, the industrial patterns of inward FDI are different from each other. In Brazil, Russia and India, the tertiary sector receives the most inward FDI on average, while the primary sector receives the least and the secondary sector is in the middle. But China has a special industrial patterns of inward FDI, the secondary sector dominant the majority of the inward FDI and the primary and tertiary sectors receive only a bit (*Duan* 2009).

It is widely recognized that external flows in the form of trade and capital are one of the main vehicles of knowledge acquisition in developing countries. Greater openness to external flows

allows importing technology, which can lead to faster accumulation of knowledge and higher total factor productivity, due to resource allocation from lower to higher productive activities (Grossman & Helpman 1991,Schiff & wang, 2006). Foreign trade exposes domestic firms to international competition and provides an additional incentive for them to improve efficiency and adopt more advanced technology. Foreign direct investment is also an important vehicle for the transfer of technology. Along with capital, foreign companies bring in advanced production technology and management capabilities, which are potential sources of technological spillovers (Crespo & Fontoura 2007, Narula &Driffield). The presence of foreign companies also increases local competition and forces domestic firms toimprove their efficiency. Overall, knowledge spillovers arising from external flows are a major channel to promote export upgrading.

Thangami et al (2010) in his study, used Gravity model analysis of the determinants of FDI and Growth model to know the growth effect of FDI in analysing South Asian countries refers to India, Bangladesh, Pakistan and Sri Lanka.The data set drawn from two different sources comprises time series data of four countries for the period of 1995-2008.Major findings were that all the explanatory variables showed that FDI is positively influenced by economic growth of host and home countries and the distance variable has negative association with FDI. Human development index, population and electricity consumption per capita are also found to have positive association with FDI. In specification, exchange rate is also positively associated with FDI, but human development index is reported as insignificant. Gravity variables namely relative income, distance and population and as other explanatory variables. All are included in multiplicative form into the traditional gravity model. Kyam (2010) found that the Turkish outward FDI is market seeking and the Foreign markets are used as substitutes for domestic markets by Turkish firms. He also concluded that Turkish FDI produces low quality goods of high domestic markets by Turkish firms, thus Turkish FDI produces low quality goods of high products in the host countries so as income of the host countries increases outward FDI of Turkish firm's decreases.

As location is concerned a study based on whether the low FDI in Iceland can be explained through locational factors or market size through the use of Gravity Model (*Kristjansdottir* 2005) also analyses fixed source country effects and sector specific effects of FDI in Iceland, covering both source countries and sectors of allocation over time. The data dimensions also allow for simultaneous estimates for sectors and trade blocs. The results indicate that FDI is negatively affected by distance, and generally negatively affected population of the host and source country, but positively affected by their gross domestic products (GDPs).FDI inflow has been higher in those sectors where market imperfections give an opportunity to exploit ownership advantages of FDI making companies to increase their margins and hence profits. *Chaudhuri et al* (2013) in his paper analysed cross country statistics have concentrated on location specific factors related to growth, market size, tax policy, exchange rate, quality of institutions, differences in firm export propensity and intensity are a consequence of firm-level(microeconomic), of place-based (macroeconomic) first- and second-nature geography characteristics, or of a combination of the two. The results indicate that both internal and external factors matter. Second-nature, rather than first-nature, geography makes an important difference. The conditions of a firm's province and those of neighbouring provinces shape firm exports. Theconditions of the provinces where a firm is located and thoseof their neighbours influence exports, making regional policy a potentially important tool for promoting exports (Roos 2005, p.606). But, rather than pure population agglomeration,the factors that play a more relevant role are those linked toagglomeration effects, education, and transport infrastructure endowment. Firms export and export a greater share of their output when they are surrounded by other exporting firms and by other firms in the same industry. Education and road density in a province and in neighbouring regions also affect (Pose, Winkler, Tselios, Farole 2013).

Amighini and Sanfilippo (2014) explore the impact of FDI and imports on the upgrading of African exports and found that South–South flows impactdifferently from North–South ones on the ability of recipients to absorb the positive spillovers. Results support the view thatSouth–South integration has a strong potential for accelerating structural transformation in the continent. South–South FDI foster diversification in key low-tech industries such as agro-industry and textiles, and raise the average quality of manufacturing exports, while importing from the South increases the ability to expand the variety of manufactured exports and to introduce more advanced goods inless-diversified economies. A high potential of South–South integration due to a smallertechnology gap and to a similar level of production capacities. Not only we show that rising trade and investment flows from the South have already recorded a positive impact on the productive performance of African economies, but we also find evidence that integration with other developing countries can support African countries' export upgrading in different sectors and at different stages of development when compared to North–South flows. South–South trade flows, being relatively more diversified compared to North–South trade and less technologically far away from the production capacities of the host country, can improve the capacity of importing countries to expand the variety of manufacturing exports in a number of different industries, even more so when these countries are at low-mid stages of diversification.

The role oftechnology has become more important in the present scenario as the world is moving toward knowledge economy and the only way countries can sustain growth is by aggressively promoting technological efforts of their domestic firms. Developing countries, such as India, have been striving hard to promote technological advancement through indigenous R&D efforts as well as through technology imports (Basant1997). In case of India, FDI flows picked up after the significant dose of liberalisation happened in the early 1990's. The flows became significantly higher in the year 2000 and thereafter specifically in service sectors. Results showed that manufacturing FDI in India is significantly negatively affected by tariffs, import intensity and R & D intensity, whereas it is significantly positively impacted by the concentration of market power.

The entry of foreign firms in India since the reforms forces domestic firms to undertake R&D activities or import technology so as to compete with them.FDI and R&D are found to be complements when sample is divided on the bases of equity ownership. FDI inflow induces foreign-owned firms in high tech industries and firms in minority ownership to invest in R&D (Sashidharan 2011).Further it has been found that other than Economic Stability and Growth prospects (measured by inflation rate and Industrial production respectively), Trade openness (measured by the ratio of total trade to GDP) seem to be the potential determinants of FDI inflows in BRICS countries. *(Narayanamurthy Vijayakumar et al 2010).* The empirical results are robust in general for alternative variables determining FDI flows. The study made an attempt to identify the factors determining the FDI inflows of BRICS countries from the period 1975 to 2007. Dominated by scepticism at first, the five emerging economies had become, for a decade, a symbol of change of power in the global economy and an important representative of the developing world in the development and cooperation relations at bilateral, regional and even multilateral level. BRICS states are increasingly dependent on foreign trade. The analysis of data from the period 2001-2007 reflects the best the characteristics and national trade level in the BRICS. In these years, the five countries have seen the flowering stage through a high growth trend, especially in living standards (India), meaning a strong development momentum. An analysis of current foreign trade and FDI flows in the region is constructed taking database from the UNCTAD, WTO (*Diana Popa and Lenuţa Carp*2013).

Most of the economic determinants are more important than the political and institutional factors affecting FDI inflows. Most of the FDI in BRICS are motivated by Market seeking purpose, and not natural resource seeking purpose. The study shows that market size which is determined by GDP is one of the most significant determinants of FDI inflows in BRICS countries. Market size and Trade open-ness have a positive effect on inward FDI inflows. Natural resources have a negative effect on inward FDI inflows (*Pravin*2010).). A study conducted by Bartels, Napolitano and Tissi (2013)find firstly the most powerful factors, influencing the political-economy and trade dynamics of hosts to FDI is stable over time. Again, by 2010, production inputs become the most important factor for FDI followed by political-economic stability.

Objectives of the study

In the BRICS countries, both trade and FDI flows are considered to be stimulating factors of the host nation's development strategies. The increase in production activities helps to exploit the benefits of enterprises and countries, increase competitive pressure in international markets and stimulate technology transfer and innovative activity resulting in improved economic growth. Policies and guidelines are designed accordingly in order to facilitate flows of trade and FDI, which will create employment and lead to poverty reduction. A strong motivation for this is the possible existence of FDI productivity gain and determinants that would affect the entry strategy of multinational corporations (MNCs) towards investing in a particular country. Essentially, both trade and FDI performs an important role in the development of an economy as well as to promote opportunities in employment and production of industries.
The purpose of the study is:
  (a) To investigate the determinants of Trade flows in the BRICS countries.
  (b) To investigate the determinants of FDI flows in the BRICS countries.
The determinants of the FDI and Trade flows that are taken into study were GDP, GDP growth rate, Distance between the host and source countries, common language, common border and population.

Data and Methodology

The study is based on secondary data and the major source of information from where the database was made available for empirical analysis is stated. An augmented gravity model was constructed, and the Trade and FDI equation includes GDP per capita, GDP growth rate, Distance, Common language, Common border, and Population database, FDI and Trade flows. The GDP per capita (Gross domestic product divided by mid-year population) and GDP growth rate (Gross Domestic Product Growth Rate used often as proxies for size and growth of market demand and supply) was taken from World Bank and World Development indicators. Bilateral Trade flows are obtained from Comrade. Bilateral FDI flows are taken from UNCTAD database. Distance, Common language and Common border between the two countries are taken from CEPII database. Population statistics is taken from World Development indicators. Exports (total exports of a country reported) and Imports (total imports of a country reported) are taken from UNCTAD and World Bank.

The whole study was done through Panel Data Analysis of 15 countries for a period of five years (2008-2012) .Out of 15 countries selected, 5 countries were taken as the host economies i.e. Brazil, India, Russian Federation, China and South Africa (BRICS) and 10 countries were taken as the source countries namely Belgium, Canada, France, Germany, Italy, Japan, Netherlands, USA, UK and Republic of Korea. Bilateral Trade and FDI flows between the host and source economies were investigated employing Panel regression with the Fixed Effects and Random

Effects Model. In case of the Bilateral Trade flows equation it was observed that The Fixed Effects model was supported and The Random Effects model was rejected in the analysis based on the Haussmann specification test (1978), a test that assists in making choices between Random effects. Since Fixed Effects model was supported it was observed that some variables were rejected (Comp, Comb and LNpopln) and in order to capture the values of the variables rejected we needed to conduct the FEVD model also. The values of the omitted variables were captured after performing the FEVD model and the results found were highly significant. Under the FDI equation both Fixed and Random effects model was conducted and the Random effects model supported the equation so there was no necessity of performing the FEVD model. After performing the panel data analysis of theFDI and Trade flows equation it was found out that the Gravity model showed significant results in case of Trade flows i.e. Bilateral trade flows between two countries are more reactive then FDI flows in period (2008-2012).

Data analysis

The study is based on secondary data and the explanatory variables selected for the study are GDP, GDP growth rate, distance between host and source countries, common language, common border and population. Gravity Model is used to find out the effectiveness of these explanatory variables on the dependent variables i.e the trade and FDI flows. The analysis is conducted for 15 countries out of which there are five host countries and 10 source countries. The host countries are the BRICS i.e (Brazil, India, China, South Africa and Russia) and the source countries includes Belgium, Canada, France, Germany, Italy, Japan, Netherlands, USA, UK and Republic of Korea. Frequency of data is annual and it is from 2008 to 2012. The independent variables i.e the GDP and GDP growth rate are taken from World Development indicators, Common language and border is taken from the comrade statistics ,population data from World Development indicators and distance from the CEPII.

The dependent variables in this study included the bilateral trade flows ($Trade_{ijt}$) and the bilateral FDI flows (FDI_{ijt}) in all the five countries and the independent variables that are expected to determine both the bilateral FDI and Trade flows are carefully chosen, based on previous literatures and availability of dataset for the selected period. The independent variables in this estimation are:

- Gross Domestic Product (in Current US$)
- Gross Domestic Product Growth rate
- Distance between the host and source countries
- Common language between the host and source countries
- Common border between the host and source countries
- Population of the host countries

The Trade and FDI equation are given as under:

FDI = f (market size, market growth rate, distance, common language, common border, population)   ....(1)

Trade =f (market size, market growth rate, distance, common language, common border,population)   ....(2)

Equation (1) can be changed into econometric form as:

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$$LNFDI_{ijt} = \alpha + \beta_1 LNGDP_{it} + \beta_2 LNGDP_{jt} + \beta_3 LNGDPG_{it} + \beta_4 LNGDPG_{jt} + \beta_5 LNdist_{ij} + \beta_6 comb + \beta_7 coml + \beta_8 LNpopln \ldots\ldots\ldots(3)$$

Equation (2) can be changed into econometric form as:

$$LNTrade_{ijt} = \alpha + b_1 LNGDP_{it} + b_2 LNGDP_{jt} + b_3 LNGDPG_{it} + b_4 LNGDPG_{jt} + b_5 LNdist_{ij} + b_6 comb + b_7 coml + b_8 LNpopln. \ldots\ldots\ldots(4)$$

In the above equations $LNTrade_{ijt}$ is the log of bilateral trade flows in current US\$ between host (i) and source country (j) at time, whereas $LNFDI_{ijt}$ is the log of bilateral FDI flows in current US\$ between host and source country at time t.$LNGDP_{it}$ and$LNGDP_{jt}$ are the log of GDP in current US\$ for host country i at time t and log of GDP in current US\$ for source country j at time t.$GDPG_{it}$ and $GDPG_{jt}$are the GDP growth rate in percentage for host country i at time t and source country j at time t.$LNdist_{ij}$ is the distance between the host and source countries.*comb* is the common border between the host and source countries and coml is the common language between the host and source countries. And finally LNpopln is the log of population of the host countries.In this study, both extended gravity model and panel data analysis are employed for analysing the determinants of bilateral Trade and FDI flows in the BRICS.Now before going into the theoretical analysis of the variables it is significant to know about Gravity model and Panel data analysis.

The gravity equation in international trade is one of the most robust empirical finding in economics: bilateral trade between two countries is proportional to their respective sizes, measured by their GDP, and inversely proportional to the geographic distance between them. They are used in various social sciences to predict and describe certain behaviours that mimic gravitational interaction as described in Isaac Newton's law of gravity. Generally, the social science models contain some elements of mass and distance, which lends them to the metaphor of physical gravity.

Fifty years ago, Jan Tinbergen (1962) used an analogy with Newton's universal law of gravitation to describe the patterns of bilateral aggregate trade flows between two countries A and B as proportional to the gross national products of those countries and inversely proportional to the distance between them. The so called "gravity equation" in international trade has proven surprisingly stable over time and across different samples of countries and methodologies.
The simple Gravity model takes place in the form of:

$$Tij = A\frac{YiYj}{Dij}$$

It relates to trade between any two (or more) countries to the size of their economies.

Where, T_{ij} is the value of trade between two countries, A is used as constant, Y_i and Y_j is country i's and country j's GDP and D_{ij} is the distance between the two countries.In the our study, we involved the simple gravity equation along with the augmented form of for both bilateral Trade and FDI flows equation that has been provided in the above equations.The augmented form of gravity equation involved the variables other than then basic gravity model which included the effect of market size and distance over bilateral trade flows between two countries and other

factors such as common language, GDP growth rate, common border and population.An augmented gravity model was constructed, and the Trade and FDI equation includes GDP per capita, GDP growth rate, Distance, Common language, Common border, and Population database, FDI and Trade flows. The GDP per capita (Gross domestic product divided by mid-year population) and GDP growth rate (Gross Domestic Product Growth Rate used often as proxies for size and growth of market demand and supply) was taken from World Bank and World Development indicators. Bilateral Trade flows are obtained from Comrade. Bilateral FDI flows are taken from UNCTAD database. Distance, Common language and Common border between the two countries are taken from CEPII database. Population statistics is taken from World Development indicators. Exports (total exports of a country reported) and Imports (total imports of a country reported) are taken from UNCTAD and World Bank.

The panel data estimation is employed in the study to capture the dynamic behaviour of the parameters and to provide more efficient estimation and information of the parameters. Panel data techniques are used because of their advantages over cross-section and time series in using all the information available, which are not detectable in pure cross-sections or in pure time series. [Baltagi and Kao (2000)]. Hsiao (1985, 1986) and Baltagi (1995) argued, panel data sets possess several major advantages. Panel data suggest individual heterogeneity to reduce the risk of obtaining biased results and provide a large number of data points (observations) to increase the degrees of freedom and variability and to be able to study the dynamics of adjustment. The Panel data model includes three different methods:

- Random effects method (REM) Model:The Random effects method is an alternative method of estimation which handles the constants for each section as random parameters rather than fixed.
- Fixed effects method (FEM) Model: The Fixed effects method treats the constant as group (section) - specific, i.e. it allows for different constants for each group (section). The fixed effects also called as the Least Squares Dummy Variables (LSDV) estimators. The FEM using dummy variables is known as the least-squares dummy variable (LSDV) model. FEM is appropriate in situations where the individual specific intercept may be correlated with one or more regressors.
- Hausman Specification Test: The test evaluates the significance of an estimator versus an alternative estimator. It helps one evaluate if a statistical model corresponds to the data. This test compares the fixed versus random effects under the null hypothesis that the individual effects are uncorrelated with the other regressors in the model (Hausman 1978). If correlated (H0 is rejected), a random effect model produces biased estimators, violating one of the Gauss-Markov assumptions; so a fixed effect model is preferred.

The whole estimation of investigating the determinants of bilateral trade and FDI flows was constructed through Panel Data Analysis of 15 countries for a period of five years (2008-2012).Out of 15 countries selected, 5 countries were taken as the host economies i.e. Brazil, India, Russian Federation, China and South Africa (BRICS) and 10 countries were taken as the source countries namely Belgium, Canada, France, Germany, Italy, Japan, Netherlands, USA, UK and Republic of Korea. Bilateral Trade and FDI flows between the host and source economies were investigated employing Panel regression with the Fixed Effects and Random Effects Model. In case of the Bilateral Trade flows equation it was observed that The Fixed Effects model was supported and The Random Effects model was rejected in the analysis based on the Haussmann specification test (1978), a test that assists in making choices between Random effects and Fixed Effects. Since Fixed Effects model was supported it was observed that some variables were

rejected (Coml, Comb and LNpopln). In order to capture the values of these variables rejected, we needed to conduct the FEVD model also known as Fixed Effects Vector Decomposition.

The values of the omitted variables were captured after performing the FEVD model and the results found were highly significant. Under the FDI equation, both Fixed and Random effects model was conducted and the Random effects model supported the equation so there was no inevitability of performing the FEVD model. After performing the panel data analysis of the FDI and Trade flows equation it was found out that the Gravity model showed significant results in case of Trade flows i.e. Bilateral trade flows between two countries are more reactive then FDI flows in period (2008-2012).

Results and Findings

The outcomes of the selected variables for BRICS are given in Table4 and Table5 respectively. We have estimated Panel data analysis which includes Random effects model, Fixed effects model and Fixed Effects Vector Decomposition Model respectively for a definite study period (2008-2012).

Table 1 shows the results of Random effects model, Fixed effects model and FEVD model which confirms the significance of the variables (a) GDP of both host and source country (b) GDP growth rate of the source countries.

The empirical results that is obtained from the Random effects model depicts the overall adjusted R^2 of (0.4827) and the value of overall Adjusted R^2 in the Fixed Effects Vector Decomposition model is R^2 (0.5298) which means that the dependent and independent variables of Bilateral Trade flows does not fit well.

Table 1 Panel data results on bilateral trade flows

DEPENDENT VARIABLE: BILATERAL TRADE FLOWS (LNT)			
INDEPENDENT VARIABLES	Random Effects Estimation (REE)	Fixed Effects Estimation (FEE)	ForecastError Variance Decomposition (FEVD)
GDP host (LNGDPit)	0.700*** (0.000)	0.720*** (0.000)	0.791*** (0.000)
GDP source (LNGDPjt)	0.515*** (0.000)	0.721*** (0.000)	0.355*** (0.000)
GDP Growth host (GDPGit)	0.001 (0.800)	-0.000 (0.911)	0.005 (0.776)
GDP Growth source(GDPGjt)	0.005 (0.186)	0.003 (0.386)	0.065*** (0.001)
Distance between host and source (LNdistij)	-0.321 (0.137)		-0.404*** (0.000)
Common border (Comb)	1.736*** (0.000)		1.008*** (0.000)
Common language (Coml)	0.070 (0.840)		0.152 (0.389)
Population (LNpopln)	0.750*** (0.000)	-0.728 (0.540)	0.824*** (0.000)
Adjusted R^2	0.4827	0.4827	0.4827

Source: Author's Calculation
Note - *, **, *** indicates the *level of significance* at 10%, 5% and 1% level.
The values in the parenthesis represent the probability value (*p-value*)

The value of Adjusted R^2 is seen to be less valuable and significant. The coefficient level of the independent variables that are significant and positive in the bilateral trade flows section are LNGDPi (.791068), LNGDPj (.355970), GDPj (.0655069), LNDIST (-.4048742), comb (1.00825), LNpopln (.8242349) where GDP of both host and source countries, distance, common border and population are significant at high level of 1%, and the other explanatory variables like GDP growth rate of the host country and common language is insignificant. Distance factor is negative and insignificant as expected as it is known that greater distance will lower the trade activities and vice versa. This indicates that the variables (GDP of host and source countries, GDP of the source country, distance, common border and population) are potential determinants of Trade flows in BRICS countries and GDP growth rate and Common language are not significant determinants in determining the trade flows of the BRICS countries.

The results obtained from Table 2 interprets that the value of Adjusted R^2 is 0.3683 in the Random Effects Model, which shows that the independent and dependent variables selected in the study are not a good fit for FDI flows in the BRICS countries. Lower value of the R^2 indicates that the explanatory variables in the study fail to explain most of the variations in the dependent variable. All the explanatory variables in the study have the right expected signs in accordance to the literature reviews. The GDP of the source country is significant at high level of 1%, while GDP of the host country, GDP growth rate of host country and distance are significant at low level of 10%. The variables that turned out to be less significant are Common language, population, GDP growth rate of the source country and common border. This means that these factors are not at all significant and variations in these variables will not affect the FDI flows[1] of the host and source countries in any manner.

Table-2 Panel data results on FDI Flows

DEPENDENT VARIABLE: Bilateral FDI Flows		
INDEPENDENT VARIABLE	REE (Random Effects Estimation)	FEE (Fixed Effects Estimation)
GDP host (LNGDPit)	0.531* (0.078)	0.023 (0.959)
GDP source (LNGDPjt)	1.331*** (0.000)	0.623 (0.482)
GDP Growth host (GDPGit)	-0.029* (0.094)	-0.020 (0.341)
GDP Growth source (GDPGjt)	-0.005 (0.790)	0.000 (0.495)
Distance between host and source (LNdistij)	-0.563* (0.099)	
Common border (Comb)	0.986* (0.181)	
Common language (Coml)	0.149 (0.805)	
Population (LNpopln)	0.163 (0.440)	7.825 (0.285)
Adjusted R^2	0.3683	0.3683

Source: Author's Calculation
Note - *, **, *** indicates the *level of significance* at 10%, 5% and 1% level.
The values in the parenthesis represent the probability value (*p-value*)

Conclusion and Policy Implications

The empirical analysis has some policy implications that should be taken into consideration while framing policies especially towards a better improvement of investment climate i.e. to attract higher FDI inflows and increase the trade flows of the BRICS nations which will lead their country to a favourable economic growth. In recent years, the rapidly fast growing countries of BRICS that are endowed with large market potential are expected to raise and attract Trade and FDI flows between the host and source countries. But since less research has been conducted about FDI inflows it has become a difficult task to know the factors that are responsible for attracting FDI flows to these countries. This study made a vigorous attempt to identify the variables determining the trade and FDI flows of BRICS countries from a period between (2008-2012). The explanatory variables in the study included are Market size, GDP growth rate of both host and source countries, distance, common border and language, and population.

In our study, the positive factors that led to a rise in the bilateral trade flows between the BRICS and the rest of the world which includes the GDP of both host and source countries, Distance between two countries, (measured by log of Total Gross DomesticProduct i.e. LNGDPi, LNGDPj). Other than these factors influencing bilateral trade and FDI flows (GDPgrowth rate of the host and source countries, population, common language and common border do not contribute to favourable outcomes of trade and FDI flows. In accordance to this findings it has become clear that there is a proportional relation between trade flows and market size i.e. higher the market size higher will be trade flows and vice versa. So one should take policy implications regarding the increase in market size i.e. increasing the demand for goods in a country that will enable people to export more and import less. Government should provide subsidies for goods that are expensive in the source countries. In this way, the host economy, Say for example India will try to consume more of that good from their own country rather than importing from abroad. Incase of distance and border there is no such proper implication that can be implemented. But it is ensured that there should be arranged certain treaties between two nations, eliminating the tariff rates, that will not bridge the distance between the countries but will create a favourable climate for trade and FDI flows.

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APPENDIX
Figure I: Pattern of export flows in the BRICS
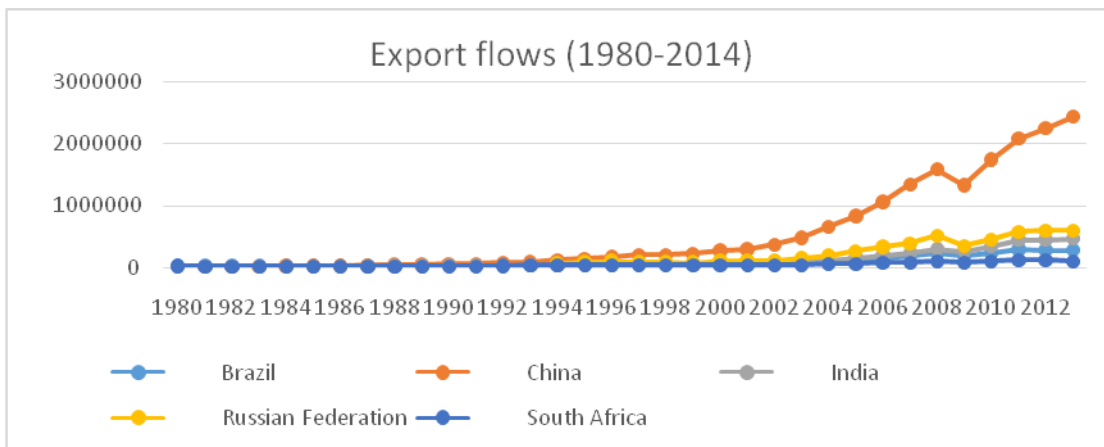
Source: Author's Calculation.

Figure II: Pattern of export flows in the BRICS
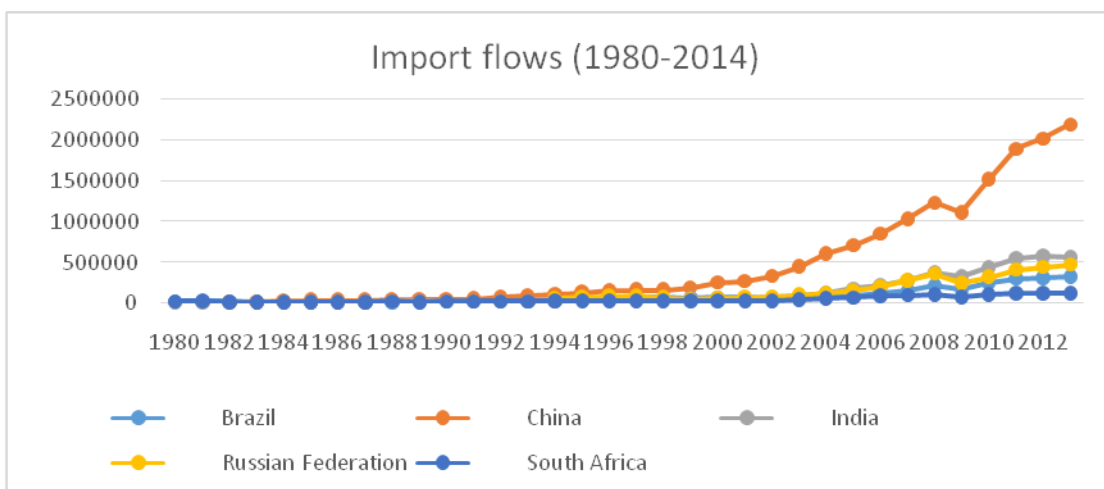
Source: Author's Calculation.

Figure III: Pattern of inward FDI flows (1980-2014)
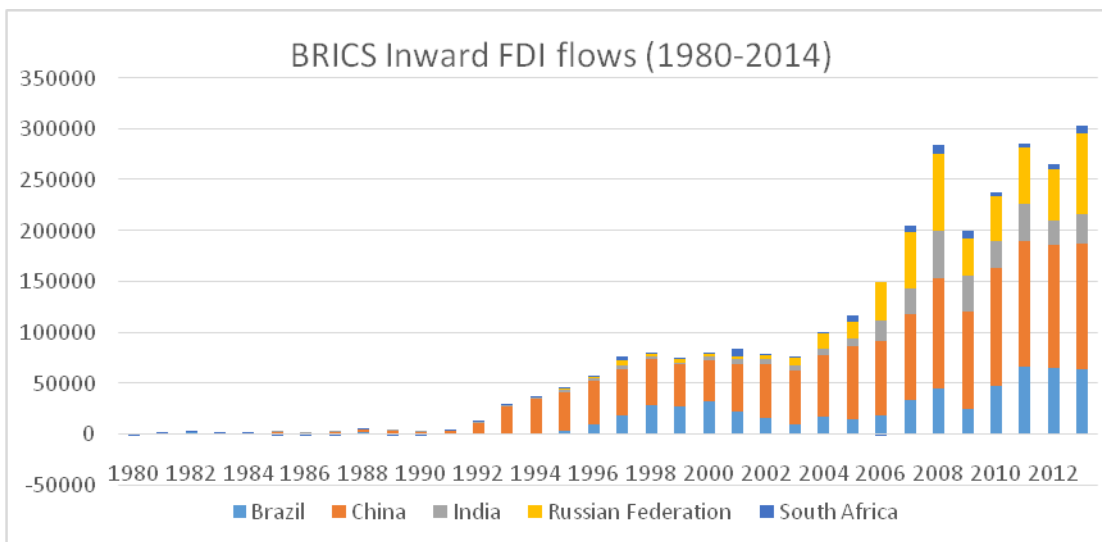
Source: Author's Calculation.

Figure IV: Pattern of inward FDI flows (1980-2014)

Source: Author's Calculation.

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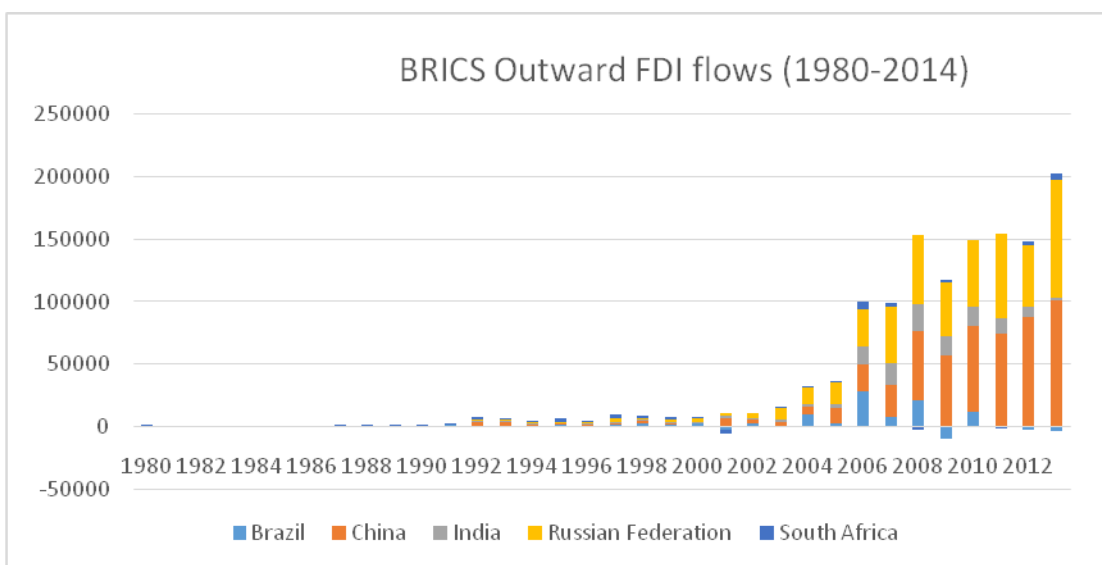
5C Model to study Online Shopping Behaviour of Indian Customer in Internet Enabled B2C E-Markets: Application of Exploratory and Confirmatory Factor Analysis

Sunil Kumar Arora*

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Abstract

The Present study attempts to investigate the Factors inducing customer participation in internet enabledB2C E-markets. Online shopping becoming an easy way in contrast to the traditional way of buying goods & services on the basis of their features and specifications i.e. without going from shop to shop. Augmented Internet penetration, upgraded security measures, suitability of shopping in lives pressed for time, and, of course, dozens of retailers to choose from these are a few factors which fascinates more and more customers to shop online. The research work found five factors which influence the customer decision to buy goods and services from the onlineshopping i.e. Cost factor, Convenience, Compatibility, Computer Hardware and Software Penetration and Potential opportunities. Cost is the main factor which motivate the customer decision to buy goods through e-retailing. With the help of internet penetrations, customer can compare the product, prices, attractive offerings, easy payments mode etc. of the products provided by the different supplier easily and can choose the products accordingly. Secondly he can access e-markets on 24X7 basis any time anywhere sitting at home and clicking the mouse instead of moving to the outlets. The development of the computer hardware, software and internet penetration has changed the world into global village which has certainly enhance the opportunities not only for the seller but also for the potential customers.

Keywords: E-Retailing, E-markets, B2C E-markets

JEL Classification M2, M31, M37

Introduction

Electronic retailing (Chandra, 2013)is most commonly known as E-Tailing, Online Shopping, through which shopping can be done via Internet and other media forms. E-tailing is "retailing conducted online, over the internet". E-tailing is synonymous with business-to-consumer (B2C) transactions.   These are online shops where a customer can choose from a variety of items like Apparel, Accessories, Mobiles/Cell Phones, Cameras, Computers, Books, Magazines, Music CDs and DVDs, Electronic, Goods, Shoes, Furniture, Health Equipment's, Flowers, etc. Marketers (Kotler Philip, 2013) can conduct on-line marketing by creating an electronic presence on the Internet, "placing ads on-line; participating in forums, newsgroups, bulletin boards and web communities; & using e-mail & web casting.

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The range of things that can be sold using that E-Marketing is enormous and covers things that are sold today and those that are not practical to sell any other way. It encompasses anything that can be described, is well defined and has value to one or more buyers. It includes art apartments and antennas, batteries, bicycles, bonds, books, clothing, computers, cosmetics etc. and whatever else can change hands.

The sector has evolved dramatically from traditional village fairs, street hawkers to resplendent malls and plush outlets, growing from strength to strength. India (ICRIER, 2010) is the seventh-largest retail market in the world, and is expected to grow at a CAGR of over 13% till FY12. Retailing (Kunz, 1997)is a distribution channel function, where one organisation buys products from supplying firms or manufactures products themselves, and then sells these directly to customers.Companies like Reliance, Tata, Bharti, Adani Enterprise, have been investing considerably in the booming Indian retail sector. Besides, a number of transnational corporations have also set up retail chains in collaboration with big Indian companies.The Indian retail sector is highly fragmented and the unorganised sector has around 13 million retail outlets that account for around 95-96% of the total Indian retail industry (Duggal, 2002).

As the world steps into the new millennium , the IT revolution that has triggered in the last decade of the 20th century intensified, mainly because of the invention of Internet which has turned the world into global village, where people interact instantly with anybody in any part of this planet through clicking of mouse and sitting before a computer connecting on world wide web (WWW), which have enabled the individual to collect so much volume of information in a year that of a person living in nineteenth century can gather in his entire life(Vijay, 2009). E-retailing (Kaplan &Sawhney, 2000) by virtue are the form of IT facilitated markets where buyers & sellers come together in market space & exchange information pertaining to price, product specifications & terms of trade and dynamic price-making mechanism (such as bid & ask system) transaction between the firms.

The business world is moving and it is redefining itself at an unmatched pace. In past internet has brought a new revolt in every field but now days it is one of the important source of income for small, medium and big organisations when customers have their product or service through internet whether they are in work place or at home. Electronic retailing gives transformation from conventional physical stock up system to classier non-store formats leads to revolution in business today. It will be used as an easy means to transact business without any harass. Electronic retailing will set a new platform for the expansion of the business.

The present research work is to dwell on aspects managed in the new era. But the backdrop for this world emerge from a better understanding of the fact that the competitive advantage for a business comes from the accumulated knowledge base, as well as ability to mobilize and integrate knowledge.

Review of Literature

Chiang & Dholakia (2003) study found that consumers' intention to shop online the information acquisition stage. The study incorporated three essential variables which are likely to influence consumers' intentions i.e. Convenience characteristics of shopping channels, Product type characteristics and Perceived price of the product. Monsuwe, Dellaert and Ruyter (2004) study the understanding of consumer attitudes toward online shopping and their intention to the shop on the internet. The study concluded that consumers' attitude toward internet shopping depend on the direct effects of relevant online shopping features such as ease of use and emotional

dimensions like enjoyment. Kim and Lee (2004) study focused on various factors affection online search intention such as utilitarian value of internet information search, hedonic value of internet information search,, perceived benefits of internet shopping, perceived risk of internet shopping and internet shopping experience predicted online search intention quite well.

Schimmel (2005) study concluded that word of mouth and public relations efforts were the most important motivations, while online communications were the lead effective. Rajamma and Neeley (2005) examined the influence of social orientation of the customers. The study found that online shoppers are more likely to be out shoppers and are likely to derive more enjoyment from shopping. Prasad and Aryasree (2009) explored the determinants of shopper behaviour such as convenience, customer service, trust, web store environment and web shopping enjoyment. Rao and Mehdi (2010) in the study explored the behaviour of internet users. They concluded that security was the most important factor from online factor from online buyers followed by reliability factor.

Davis (1993) study found customers' attitudes regarding Internet shopping are depending on the direct effects of relevant online shopping features. Online shopping features can be classified into consumer's perceptions of functional and utilitarian dimensions such as "ease of use" and "usefulness", or into their perceptions of emotional and hedonic dimensions like "enjoyment"

Vijayasarathy & Jones (2000) found that perceived risk influenced both attitudes toward online shopping and intention to shop online in line with other studies. However, perceived risk is said to decrease with internet experience (Miyazaki and Fernandez, 2001). Even Huang, Schrank and Dubinsky (2006) found online shoppers possessed lower perceived risk than non-shoppers. Reliability may relate to the ability of the web site to fulfill orders correctly, deliver promptly, and keep personal information secure (Parasuraman et al., 1988; Janda, Trocchia, &Gwinner, 2002; Kim & Lee, 20 02). Bellman and colleagues (1999, p. 33) study found that Internet surveys agree that the online population is relatively younger, more educated, wealthier, although the gaps are gradually closing. Bhatnagar and colleagues (2000) provide evidence that demographics are not relevant factors in determining which store to patronize or how much to spend, though men and women do tend to buy different types of products or services via the Internet.

For Internet buyers, gender, marital status, residential location, age, education, and household income were frequently found to be important predictors of Internet purchasing (Fram& Grady, 1997; Kunz, 1997; Mehta & Sivadas, 1995; Sultan &Henrichs, 2000) Sultan and Henrichs (2000) reported that the consumer's willingness to and preference for adopting the Internet as his or her shopping medium was also positively related to income, household size, and innovativeness. In 2000, women represented the major online holiday season buyer (Rainne, 2002. According to a report by the Pew Research Center (2001), the number of women (58%) who bought online exceeded the number of men (42%) by 16%. Among the woman who bought, 37% reported enjoying the experience "a lot" compared to only 17% of male shoppers who enjoyed the experience "a lot". Akhter (2002) indicated that more educated, younger, males, and wealthier people in contrast to less educated, older, females, and less wealthier are more likely to use the Internet for purchasing. Service quality depends greatly on the behavior of consumers. Hence, if the website design could enable consumers to use easily and quickly find the information or purchase service they need, consumers would feel the service excellence of the websites (Dabholkar, 1996; Santos, 2003). Kumar, Smith, and Bannerjee (2004) pointed out the major factors affecting the ease of use of a website interface are: language used, arrangement of information, use of metaphors, size and contrast of letters. Tatsuo Tanaka (1996), James Ho (1997) and Dirk Stelzer (2001) study concluded the factors attracting the companies to exploit

the E-Markets such New business opportunities , resolve communication barriers rather improve the communication especially in B2C E-markets .Similarly Jackson Michele (1997) & Stone & Han (1999) also studied the benefits of exploiting E-markets and also it studied the problems such Low penetration level , Requiring Computer skill , Payment Security issue and many more. HannJungpil et al (2001), Schoopmarkieke (2001), Grewal Rajdeep et al (2001) concluded that the level of participation in B2B E-Markets depends on Ability and motivation. The Ability is influenced by age based learning, effort based learning and IT capabilities. The second variable motivation is influenced by efficiency motive & legitimacy motives. Gauzente Claire et al (2001), Ruth M. Guzley et al (2001) , Kauffman J. Robert et al.(2001) suggested the strategy enabling organisation to cultivate the advantages to participate in B2B & B2C E-markets such as attractive web presence, e-payment security , prompt delivery of goods , safe surfing , effective handling of e-mails and suitable EDI system depending on the organisation nature and size of market. Arora Shivani and ChanderSubhash (2003) studied the nature of B2B & B2C E-markets and problems of prospective of exploiting e-markets through a sample size of 300 s and 50 marketers working in B2B and B2C E-Markets. It found the various barriers of e-markets such as ambiguous privacy policy, lack of payment security, lack of touch and feel, fear of hidden cost, delayed delivery, complicated ordering system. It also conclude the factors attracting to participate in B2B & B2C E-Markets such as communication benefits , instant delivery and payment , vast coverage , a new way to sell electronically, Available 24X7 , cost benefits and many more.

Objectives of the Study

In view of the above, the present study is to focus on the various factors which motivate the customers to participate in internet enable B2C E-markets. However, the specific objectives of the study are as follows:-

1. To explore the factors influencing the customers to participate in internet enabled B2C E-Markets through e-shopping.
2. To recommend the suitable strategy to cultivate the E-Retailing.

Methodology

The basic objective of the present study is to elicit the factors influencing the customers to participate in internet enabled B2C E-Markets through e-shopping. To elicit theoretical conclusion the researcher examined the available literature in the form of books, research works, research articles, reports of various committees/commissions. To study the various factors a sample of 200 customers from the three districts namely Jalandhar, Amritsar, and Ludhiana situated in Punjab through a well-structured interview schedule.

Factor Analysis

In order to analysesthe factors influencing the customer participation in e-retailing, a set of 21 statements were designed on the basis of the review of literature. These statements focused on various factors causing customer participation in B2C e-markets. The set of these statements has been presented in table I. The respondents were asked to indicate their level of agreement with each statement on a five-point LikertScale ranging from 'Strongly Agree' to 'Strongly Disagree'. For the purpose of analysis, WAS (Weighted Average Score) was calculated for each of the statement by assigning weights of 5 to 'Strongly Agree'and 1 to 'Strongly Disagree'.

Principal Component Analysis was employed for extracting factors and the number of factors to be extracted were finalized on the basis of 'Latent Root Criterion' i.e. variables having Eigen values greater than 1. Five factors were extracted which together accounted for 78.121 per cent of the variance. Finally, the Principal Component Analysis with Orthogonal Rotation has been used in the present study. In Orthogonal Rotation, it is assumed that factors operate independently of each other. Varimax Rotated Factor Analysis which is the most popular method of Orthogonal Rotation has been used and the results are presented in table 1

Table 1: Scale for the factors influence customer decision in e-retailing

V1	Effective feedback and communication with customer
V2	It reduce the Transaction Costs
V3	I will prefer online shopping because online prices are lower than outlets.
V4	Comparative prices of the competitors can be known
V5	It helps in locating the Suppliers easily.
V6	Provides complete information about the products in more attractive manner.
V7	While shopping online, I prefer to purchase from a website that provides safety and ease of navigation and order
V8	Goods can be purchased from anywhere at any time on 24X7 basis.
V9	Digital goods can be transported at negligible cost.
V10	Selection of goods available on the internet is very broad.
V11	Easy payments options are also available.
V12	Locates new product and respective markets.
V13	The website layout helps me in searching and selecting the right product while shopping online
V14	The website design helps me in searching the products easily
V15	Shopping on the internet saves time and provide in time delivery of goods
V16	Prompt offers by the seller attract customer
V17	E-retailers provides commodities at less price as compared to the traditional retailers.
V18	Rejecting the goods purchased is quite easy.
V19	Customer recognize the Web Ads more than TV Ads
V20	I make instant purchase orders and delivery of goods.
V21	E-Shoppers give attractive discounts

Suitability of Data for Factor Analysis

In order to test the suitability of data for Principal Component Analysis, the following steps are taken:

1. Apart from correlation matrix, anti-image correlations are also computed. These show that partial correlations are low, indicating that true factors exist in the data.

2. Kaiser-Meyer-Oklin Measure of Sample Adequacy (KMO) is calculated. Overall, MSA is found to be 0.791 which supports that the sample is good enough for factor analysis.

3. Bartlett's Test of Sphericity show statistically significant number of correlations in the variables.

4.   Anti-image Correlations are calculated. These showed that partial correlations are low, indicating that true factors exist in the data.

5.   Cronbach's Alpha is calculated .863 which shows that data are reliable for Factor Analysis.

6.   The communalities of the variables range from 0.432 to 0.921whereas the factor loadings range from 0.498 to 0.962 as given in the table II

Hence, as revealed by the above parameters, the data was found fit for the factor analysis.

Extraction Method and Number of Factors Extracted

Principal Component Analysis is employed for extracting factors and the number of factors to be extracted are finalized on the basis of 'Latent Root Criterion' i.e. variables having Eigen Values greater than 1. Five factors are extracted which together accounted for 68.198 per cent of the variance. Finally, the Principal Component Analysis with Orthogonal Rotation has been used in the present study. In Orthogonal Rotation, it is assumed that factors operate independently of each other. Varimax Rotated Factor Analysis which is the most popular method of Orthogonal Rotation has been used and the results are presented in table II.The results are obtained through orthogonal rotations with Varimax and all factor loadings greater than 0.40 (ignoring signs) were retained.

The results of the principal component analysis with Varimax rotation of the respondents are presented in table II. The results show that 68.198 per cent of the total variance is represented by the information contained in the factor matrix. The percentage of variance explained by five factors I to V are 24.933, 18.943, 11.0111, 7.130 and 7.181 respectively. The percentage of total variance is used as an index to determine how well a particular factor solution accounts for what all the variables together represent. The communalities have been shown at the far right side of the table II which shows the amount of variance in a variable that is accounted for by the five factors taken together.

The size of the communality is a useful index for assessing how much variance in a particular variable is accounted for by the factor solution. Large communalities indicate that a large amount of the variance in a variable has been extracted by the factor solution. Small communalities show that a substantial portion of the variance in a variable is not accounted for by the factor solution. For instance, communality figure of 0.474 for variable V13 indicates that it has less in common with other variables included in the analysis than variable V11 which has a communality of 0.930.

A factor loading represents the correlation between an original variable and its factor. The signs are interpreted just like any other correlation coefficients. On each factor, 'like signs' of factor loadings mean that the variables are positively related and 'opposite signs' mean that the variables are negatively related. The process of naming factors is quite subjective, though guidelines have been given by various authors. The names of the factors and the loadings are summarized in the table 2.

Table-3   **Factor Naming**

Factors	Label	Statement	Loadings	Reliability Cronbach's Alpha
1. Cost	Competitive Price	E-retailers provides commodities at less price as compared to the traditional retailers.	.907	.924
	Transaction Cost	It reduce the Transaction Costs	.895	
	Digital Goods	Digital goods can be transported at negligible cost.	.758	
	Price Advantage	I will prefer online shopping because online prices are lower than outlets.	.751	
	E-Offering	Prompt offers by the seller attract customer	.736	
2. Convenience	Web Surfing	It helps in locating the Suppliers easily.	.915	.916
	24X7	Goods can be purchased from anywhere at any time on 24X7 basis.	.898	
	Price War	Comparative prices of the competitors can be known	.866	
	Product search	Locates new product and respective markets.	.547	
3.Compatability	Ease in payment	Easy payments options are also available.	.924	.899
	Discounts Offer	E-Shoppers give attractive discounts	.893	
	Buy Decision	I make instant purchase orders and delivery of goods.	.870	
	Rejection	Rejecting the goods purchased is quite easy.	.570	
4.Computer Penetration	Feedback	Effective feedback and communication with customer	.859	.875
	Web Ads	Customer recognize the Web Ads more than TV Ads	.757	
	Design	The website design helps me in searching the products easily	.673	
	Time Saving	Shopping on the internet saves time and provide in time delivery of goods	.566	
5. Choice	Product Information	Provides complete information about the products in more attractive manner.	.788	.823
	Safety	While shopping online, I prefer to purchase from a website that provides safety and ease of navigation and order	.706	
	Selection Choice	Selection of goods available on the internet is very broad.	.645	
	Appropriate-ness	The website layout helps me in searching and selecting the right product while shopping online	.636	
Source:- Compiled from Primary Data				

Factor I

COST

It is one of the major factor which is responsible for the growth of e-retailing in India with 24.933 per cent of the total variance. Five out of twenty one statements are loaded on this factor which are highly correlated. Out of five, two statements V17 and V2 are highly loaded and correlated. Indian customers are tend to be more bargain while taking buying decision. E-retailing is the better solution for them as the buyers can compare the prices of the dealers even at home sitting before a computer connecting online on various e-retailers which results in decline in transaction cost. Another important advantage of internet is that we can transport digital goods at a negligible rate, which certainly attract seller as well as buyer as it reduce the cost of product also. 4th and 5th statement also loaded to this factor stating that the e-retailers offer goods to the buyer at a low cost as compared to the traditional outlets as they have to spent a lot on the physical structure while e-markets are not made of brick and sand. Buyers can compare the prices of divergent sellers within very short time as everything is readily available on the internet which certainly influence the decision making. To attract the customers the e-retailers give attractive offers which can be known within seconds otherwise is not possible in case of traditional kind of marketing.

Factor II

Convenience

The second important factorwhich influence the e-retailing in India with percentage of variance equal to 18.943 per cent. Four statements out of twenty one are loaded on this factor. Three out of four are highly loaded and correlated with each other – V5, V8, and V4 respectively. Customer think that buying goods on internet is quite comfortable as compared to the tradition marketing. It helps the Customer in locating the suppliers easily sitting on a computer and connecting to World Wide Web. Goods can be purchased from anywhere at any time on 24X7 basis and the respective prices of the competitors can be easily known and they can locate new products very easily any time anywhere in the world.

Factor III

Compatibility

This is the third important factor with percentage of variance equal to 11.011. Four out of twenty one statements V11, V21, V20 and V18 have been loaded on this factor. Three statements out of four are highly loaded while one item V18 is not highly loaded. E-Retailing is more compatible as compared to the traditional markets. It provides easy payment option to the buyer (Payment Option: Debit card, credit card, cash on delivery, and easy EMI etc.) which make this market more compatible to the traditional outlets. Furthermore the e-retailers provides attractive discounts to the customer and even instant delivery in case of digital goods make these markets more compatible and attract the Customers to a great extent.

Factor IV

Computer Penetration

This is the fourth major factor responsible for the accumulated refund with percentage of variance 7.131. Four statements V1, V19, V14 and V15 are loaded on this factor with positive correlation

of .859, .757, .673 and .566 respectively. Out of the four, two (V1 and V19) statements are highly loaded and positively correlated . The tremendous growth and development of e-retailing is due to the development of computer penetration and tele-communication media to an unexpected extent. The development of 2G, 3G and 4G has increased the viability of these markets. Customers give more attention to the Web Ads than the TV Ads and further these penetration helps customer to match the products to their requirement quite quickly and comfortably even sitting at home which in turn saves time and provide in time delivery of goods.

Factor -V

Choice

This is the last but very significant factor accountable for the accumulated refund with percentage of variance 7.181. Four out of twenty one statements are loaded on this factors such as V6, V7, V10 and V13 with positive correlation of .788, .706, .645 and .636 respectively. Two statements are highly loaded and rightly define the factor i.e. "Provides complete information about the products in more attractive manner and While shopping online, I prefer to purchase from a website that provides safety and ease of navigation and order".

Confirmatory Factor Analysis

This section confirms the various factors extracted with the help of EFA which influence the online shopping buyer behaviour.Factor analysis is now considered *exploratory factor analysis(EFA)*, that is, with no or few pre-conceived notions about what the factor pattern will look like. There are typically no tests of significance for EFA. On the other hand, we have a theoretically or empirically based conception of the structure of measured variables and factors and that enables us to test the adequacy of a particular "measurement model" to the data. This part of the study covers the design of model of the Five factors extracted by the researcher with the help of EFA as to which factors more influence the buyer decision . Till today very meager literature is available on the subject matter and Confirmatory Factor Analysis (CFA) is best suited in case of such type of situation. The exploratory 5C model for the problem provides five main factors responsible for delayed VAT refund which are ;

1. Cost
2. Convenience
3. Compatibility
4. Computer Penetration
5. Choice

Which factor is more accountable and which is less depends upon the factor loading of that very factor. The exploratory study suggests that the first main factor which influence the buyer decision is "Cost". Most of the customer in India compares the relative prices and quality of the product of each seller offering goods in e-retailing. The process of model testing is carried out with the help of AMOS 18. Figure I

The five factor proposed model determined with the help of EFA is depicted in the figure I which is tested with the help of AMOS 18.0 to confirm to the five factors and to determine the estimated model exploring the various factors influencing customer decision .Which factor is more accountable and which is less depends upon the factor loading of that very factor. The

exploratory study suggests that the first main factor is among the 5C is 'Cost'. The loading values in respect of five variables V17('Competitive price'), V2('Transaction Cost'), V9('Digital Goods'), V3(' Price Advantage') and V16('E-offering') obtained with the help of AMOS 18.0 are .97, .93, .84 , .72 and .31 respectively which indicate that in all the loaded variables the loading value in respect of one variable V16 is quite low , which is creating the problem for the proposed model fit. Which variable is more relevant is determined by the factor loading obtained by that very factor.

The next important factor which motivate customer decision in online shopping is 'Convenience' which includes four variables i.e. V5 ('Web Surfing '), V8 ('24X7 basis'), V4 ('Price War') and V12 ('Product Search') with loading values .92, .81, .78 and .68 respectively. Three statements are heavily loaded while the fourth variable V12 is given slightly low rating which in turns may create problem for model fit.

Figure7.6

Disaggregated Proposed Model determined with EFA (Model A)
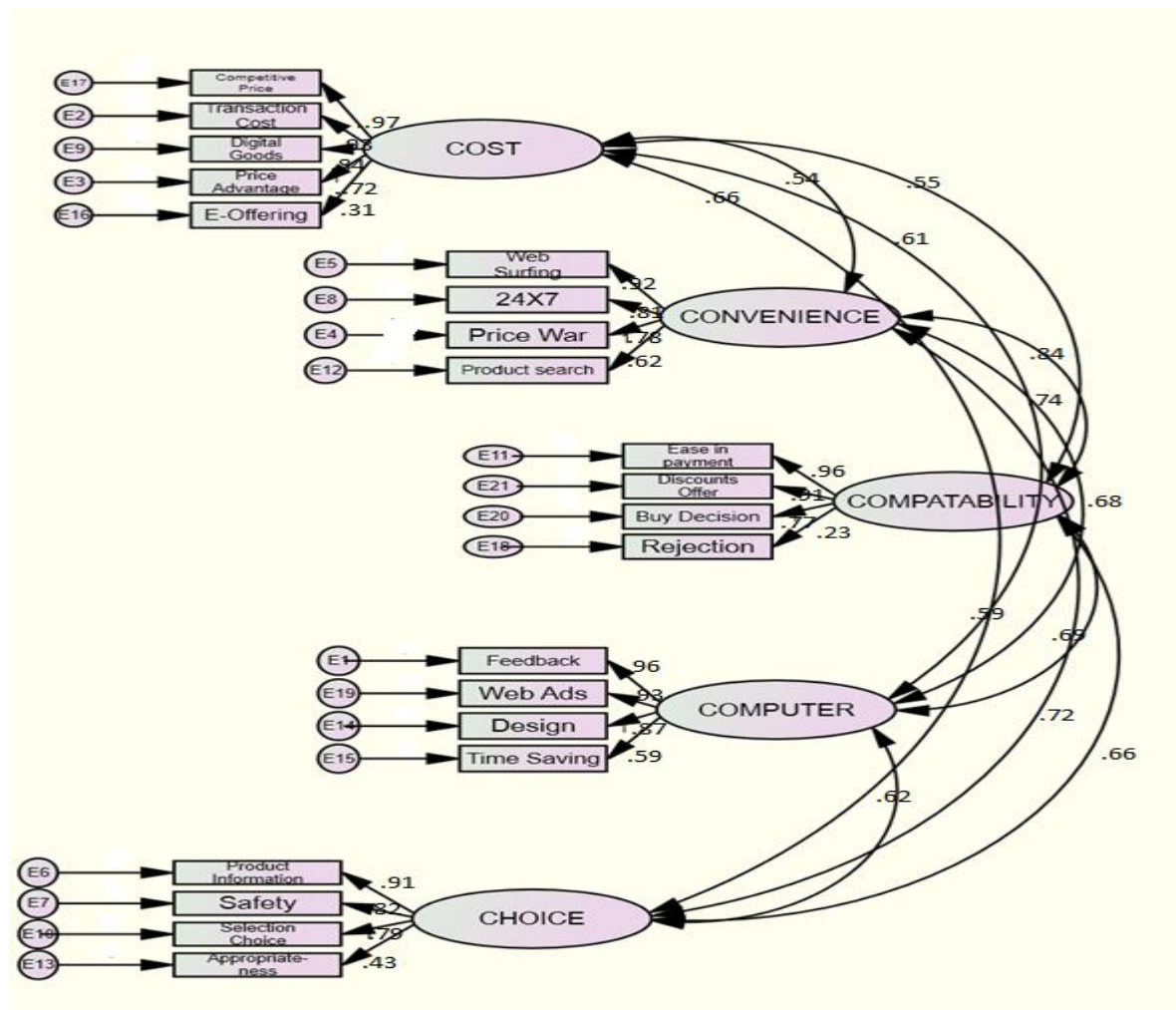
The 3rd factor among the 5C that influence the buyer decision is the 'Compatibility'. Four statements are loaded on this factor and out of which three statements are heavily loaded i.e. V11 ('Ease in Payment') , V21 ('Discount Offer'),V20 ('Buy Motive') and V18('Rejection') with loading values .96, .91, .77 and .23 respectively which indicates that the variable V18 is creating the problem for the model because is loading value is quite low.

 The 4th factor among the 5C isComputer Penetration including Hardware and Software facilities available to the customer while going online markets. . Four statements are loaded on this factor i.e. V1('Feedback'),V19('Web Ads'), V14('Design') and V15('Time Saving') with loading values .96,.93,.87 and .58 respectively. The loading value in case of the e15 may create barrier for the model fit.

 The fifth factor which the buyer decision among the 5C is Customer choice to exploit the market opportunities. Four factors are loaded with this factor i.e.V6('Product information') ,V7('Safety '),V10('Selection Choice') ,V13('Appropriateness') with Loading Values .91, .82, .79 and .43 respectively.

The process of model testing is carried out with the help of AMOS 18 figure I. After identifying five clear factorsthrough principal components analysis, the next step is to confirm the factor structure through applying Structural Equation Modeling (SEM) using AMOS 18.0 to perform the first-order confirmatory factor analysis on the proposed measurement model in Figure I. The model consists of the first-order five-factor structure, consisting of 5C variables (Cost, Convenience, Compatability, Computer and Choice) with the measurement variables loading in accordance with the patternrevealed in the exploratory factor analysis on sample.The explored Model A is totally disaggregated first-order model. In this, 21 items are proposed to measure a single first-order factor causing accumulated VAT refund This model yielded a poor model fit indices $\chi2$ = 674.62; p<.001; *d.f.*= 20;CMIN/DF=4.982, GFI = 0.821; AGFI =0.756;CFI = 0.813; NFI = 0.758; IFI = 0.823; TLI =0.798; and RMSEA = 0.104.

The above results indicate that the above proposed model is not reliable as it does not satisfy the requisite of model fit. The next step is to decide as to which variable should be deleted or needs to be covariate in order to obtain the best model

Figure II indicates the result of estimated model obtained with the help of AMOS by deleting some variables which are creating problems while satisfying the properties of the model fit. To obtain the best model which satisfies the basic properties of model the next step is to covariate the variable with highest M.I. value. M.I. Value in case of variablesV8('24X7 basis') ←→V12 ('Product Search') is the highest i.e. 63.67 and further these variables are loaded on the same factor i.e. Factor-2 ('Convenience') , there is possibility to covariate these variables . Similarly in case of two variables V14('Design') ←→V15('Time Saving') , the M.I. value is quite high i.e. 43.12 and further these variables are loaded on the same factor-4('Computer Penetration') , there is possibility to covariate these variables to obtain the model fit indices.

The M.I. Value in case of variables V8 ('24X7') ←→V12 ('Product Search') is thirdhighest value i.e.27.11 and further these variables are loaded on the same factor i.e. Factor-5('Choice') , there is possibility to covariate these variables .

After the covariate step is over, to obtain the model fit the variables with lowest loading value werealsodeleted because low loading value means that this variable is not responsible for the accumulated VAT Refund. In case of the first factor ('Cost') , the loading values of the different variables V17('Competitive price'), V2('Transaction Cost') , V9('Digital Goods') ,V3(' Price

Advantage') and V16('E-offering') are obtained with the help of AMOS 18.0 are .97, .93, .84 , .72 and .31 respectively which indicates that in all the loaded variables the loading value in respect of one variable V16 is quite low , which is creating the problem for the proposed model fit and hence it is deleted to obtain the best model fit pertaining to the problem.

Figure II

Disaggregated Model (Model B)(Standardized Estimates)
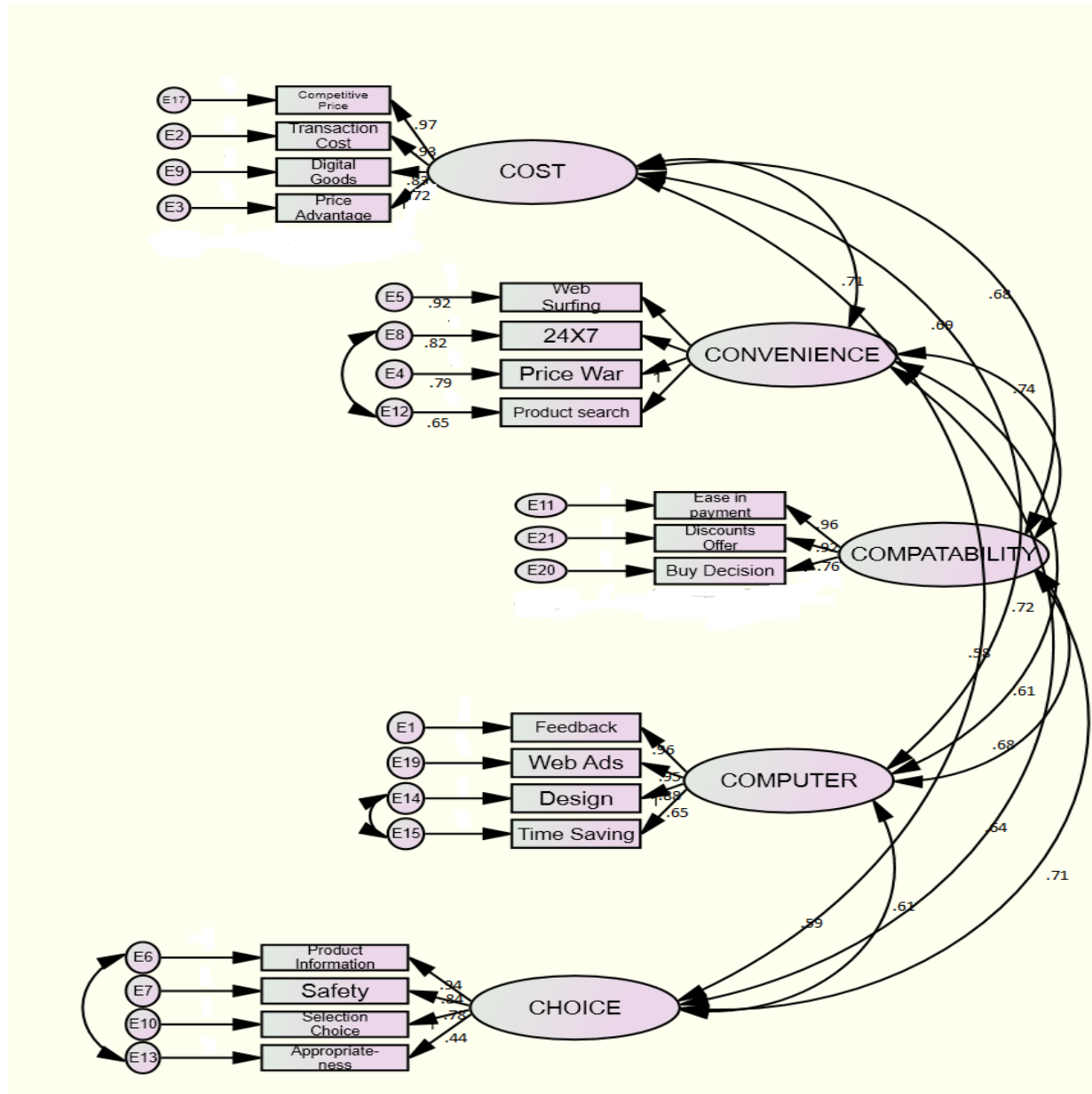
Similarly, in case of the 3rd factor ('Compatibility ') , the loading values of the different variables V11 ('Ease in Payment') , V21 ('Discount Offer'),V20 ('Buy Motive') and V18('Rejection') are

.96, .91, .77 and .23 respectively which indicates that the variable V18 is creating the problem for the model because loading value is quite low which is definitely creating a problem to fit the proposed model and it needs to be deleted to obtain the best model fit pertaining to the problem.

After doing the necessary changes, the AMOS 18.0 is applied to check whether the Model satisfies all the properties which are essential for the Model Fit. The process of model testing is carried out with the help of AMOS 18.0 and a new estimated model is obtained as depicted in the figure II .

The model consists of the five factor structure, consisting of five latent variables with the measurement variables loading in accordance with the pattern. The Model B is still totally disaggregated first-order model. In this, 19 items are proposed to measure a single first-order factor influencing buyer decision. This model yielded a poor model fit indices $\chi2$ = 517.41; p<.001; *d.f.*= 18;CMIN/DF=4.431, GFI = 0.888; AGFI =0.866;CFI = 0.901; NFI = 0.846; IFI = 0.876; TLI =0.872; and RMSEA = 0.103.

The above results indicate that the estimated model B is not reliable as it does not satisfy the requisite of model fit. The next step is to decide as to which variable should be deleted to obtain the best model.

To obtain the best model fit few changes are made in the model B, which satisfies the basic properties of model. The next step is to covariate the variable with highest M.I. value provided both the variables lies on the same factor. M.I. Value in case of variables V21 ←→V20 is highest i.e. 22.31, hence these variables need to covariate to obtain the model fit. Other variables with highest M.I. value on the same factor V6 ←→V10 with highest M.I. Value 16.67 need to covariate to obtain the model fit.

After covariating the variables, to obtain the model fit the variables with lowest loading value are also deleted. In case of 4thfactor ('Computer penetration') as depicted in the Model B, the loading values of the four variables i.e. V1,V19, V14 and V15 are .96,.92,.86 and .59 respectively. The loading value in case of the e15 is quite low which creates whole some problem for the model fit; hence it is deleted to obtain the model fit.

Likewise in case of the 5th factor ('Choice') as depicted in the Model B, the loading values of four variables i.e. V6,V7, V10 ,V13 are .92, .81, .79 and .48 respectively. Although the loading value of the variable V13 has been improved in the model B , but still it is very low and creating problem for the model fit, hence is deleted to obtain the Model C. After doing the necessary changes, the AMOS 18.0 is applied again to check whether the Model satisfies all the properties which are essential for the Model Fit and a new Model C is obtained as depicted in the figure III

Figure III

Model (Model C)(Accepted Model)
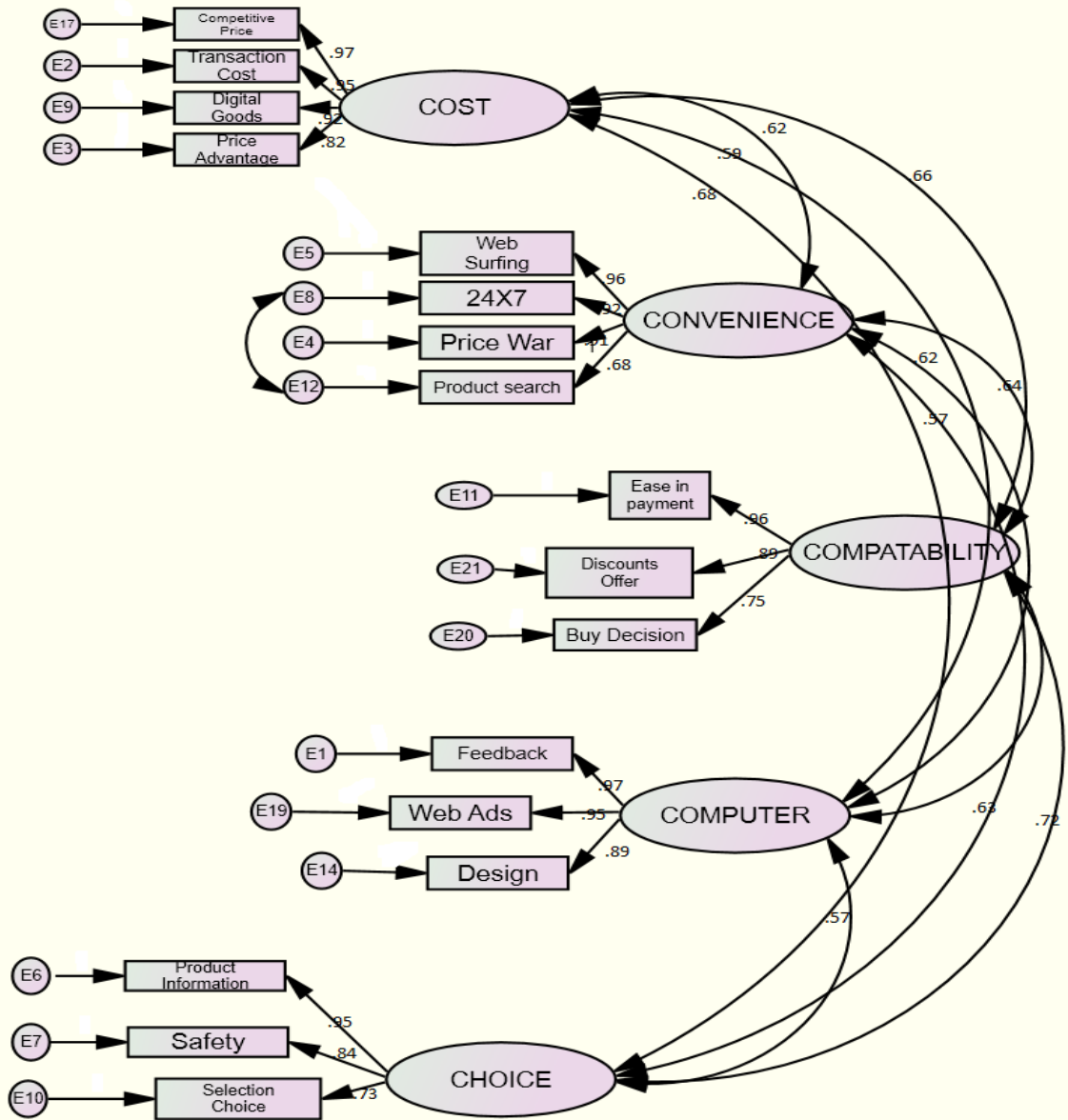
The Model C duly obtained after the requisite modifications proves to be an acceptable model fit the data ($\chi 2$ = 308.322, p< .001; GFI = 0.944; AGFI =0.964; CFI = 0.966; TLI = 0.945; IFI = 0.965; NFI = 0.923 and RMSEA = 0.023) which indicates all the indicators loaded significantly on the latent constructs. The values of the fit indices indicate a reasonable fit of the measurement

model with data. In short, the SEM model confirms to the five-factor structure of the variables influencing customer decisions to participate in e-markets

Summary, Recommendation and Conclusion

The Present study "**5C Model to study Online Shopping Behaviour of Customer In Internet Enabled B2C E-Markets** "attempts to investigate the Factors inducing customer participation in internet enable B2C E-markets. Online shopping becoming an easy way in contrast to the traditional way of buying goods & services on the basis of their features and specifications i.e. without going from shop to shop. Augmented Internet penetration, upgraded security measures, suitability of shopping in lives pressed for time, and, of course, dozens of retailers to choose from – these are a few factors which fascinates more and more customers to shop online. The present research work explores the five factors influence the customer decision while conducting online retailing i.e. Cost factor, Convenience, Compatibility , Computer Hardware and Software Penetration and Potential opportunities available in exploiting e-retailing. Cost is the main factor which influence the customer decision to buy goods through e-retailing. Customer can compare the product, prices, attractive offerings, easy payments mode etc. of the products provided by the different supplier easily and can choose the products accordingly. Secondly he can access e-markets on 24X7 basis any time anywhere sitting at home and clicking the mouse instead of moving to the outlets. The development of the computer hardware, software and internet penetration has changed the world into global village which has certainly enhance the opportunities not only for the seller but also for the potential customers.

The model was tested with the help of Confirmatory Factor Analysis (CFA) to test the exploratory model found by the application of the EFA (exploratory factor analysis). The exploratory model obtained five main factors influencing customer decision while shopping in online markets. Three models were obtained and tested with the help of AMOS 18.0 and the two models were disaggregated model while one model was acceptable which fulfilled the requisite of the model fit. The measurement of the acceptable model indicates an acceptable model fit of the data ($\chi 2$ = 308.322, p< .001; GFI = 0.944; AGFI =0.964; CFI = 0.966; TLI = 0.945; IFI = 0.965; NFI = 0.923 and RMSEA = 0.023) which indicates that the all the indicators loaded significantly on the latent constructs. The values of the fit indices indicate a reasonable fit of the measurement model with data. In short, the SEM model confirm to the five-factor structure of the variables causing accumulated VAT Refund.

Product related Strategies
E-markets are entirely different from the traditional markets because it is not like the real store of brick and motor where the customer can touch and feel the products and then buy. The study revealed that the marketers need to provide the complete information about the product , comparative prices in more attractive way through fascinating web sites and must ensure to provide the right quality of product at right prices.

Price related Strategies
Customers feel that the internet provides the product relatively at higher rate as compared to conventional marketing system and hence the efforts should be made to provide the goods at price lower than offline marketing and ensure attractive offers to promote the business.

Place related Strategies
There is dire need to deliver the goods to the customer in time through making the simplified order system. If possible the marketers must ensure the instant delivery of digital goods with full E-payment security to the customer through technically sound Hardware and Software penetrations

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Impact of Indian Foreign Direct Investment (FDI) Inflows on Productivity: A Theoretical Review

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Abstract

The study aims at reviewing impact of Indian FDI inflows on productivity during pre and post Globalization period. The study finds that impact of Indian FDI inflows on productivity are mixed, i.e. positive and negative during pre and post Globalization period. The study observed that varied results depend on characteristics of the host country and the investing firms. Explanations such as "absorptive capability" of the host economy, domestic market competition, ownership structure of foreign firms and technology gap between foreign and domestic firms in the industry can explain the different outcomes. Absorptive capability refers to the fact that FDI may be more beneficial for an industry if the domestic firms have a minimum level of technological development and human capital. Due to competition effects foreign firm can lead to crowding out of domestic firms which are unable to compete with the foreign firms are forced to make an exit which is known as market stealing effect. This study also came across that mixed results of studies are due to uses of different measuring techniques in the studies. Finally, summary of review and research issues related to impact of Indian FDI inflows on productivity is spelt out.

Keywords: Foreign Direct Investment, Impact, Productivity & Spillover

JEL classification: **E22, F21, F43 & F60**

Introduction

FDI is gradually becoming an important source of investment funds in developing countries particularly in India. Many economists, academicians, policy makers and managerial experts have described it as an important source of more production, enhancement of efficiency, growth of new technology and management know-how of firm and a useful link to world markets for Indian economy (see, for example, Balasubramanyam, Salisu and Sapsford, 1996; Fry, 1993). On the other hand, some researcher have also been expressed their views in Indian economy about whether the FDI firms might have an adverse effect on the development of domestic firms, or otherwise be a source of economic exploitation of developing countries.

Thus it is important to understand better the economic role of foreign direct investment (FDI) in Indian economy. Here some of the issues can be debatable such as: (I) Does FDI inflows crowd out domestic private investment or does it increase it by fostering various backward and forward linkages with domestic firms ? (II) Does FDI inflows increase GDP growth by increasing productivity, increasing efficiency, creating job opportunities, increasing exports, bringing in new management and production techniques, or (III) Does it lower GDP growth in the long run by taking excessive profits out of Indian economy (Agarwal P., 2004).

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The impacts of FDI on the domestic economy mainly depends on domestic policy, the kinds of FDI the domestic country receives and the strength of domestic enterprises. Very little can be said on a priori basis, as FDI results in a wide range of impact to the host county and these impacts may vary across the country. The identification and appraisal of the impact on the host economy is very important for a developing country like India. The question of quantitatively measuring the impact of FDI inflows is pertinent here as most of the developing countries are interested to go for FDI in place of formal contractual agreements for foreign loans. However, in undertaking any analysis of the impact of FDI, it should be borne in mind that FDI flows, record in the financial flows, which may or may not correspond to changes in the capital formations. In the literature on FDI, a view prevails that FDI can serve two purposes (Schneider and Fry, 1985). Firstly, it can be an additional investment to the domestic investment of the host country and thereby it can raise the investment level of the host economy. Secondly, it can add to the foreign exchange reserve of the host country and relieve foreign exchange shortages of the host economy. In other words, impacts of FDI inflows into Indian economy are of two types namely direct and indirect. In direct impact it includes impact of FDI inflows on the domestic investment, income, employment, productivity, price level and export growth. Besides these, there are also varieties of indirect impacts. Spillovers from FDI take place when the entry or presence of multinational corporations increases the productivity of domestic firms in a host country and the multinationals do not fully internalize the value of these benefits. When any company with higher productivity makes an entry, then it naturally encourages other companies within the same sector to improve their performance and competitiveness. The procedure through which the efficiency increases may be by copying new technologies or by hiring trained workers and managers from foreign-owned companies.

On the other hand, those domestic companies that are not able to catch up with the increased performance of other companies within the sector may be crowded out of the market. However, companies from sectors other than that of the foreign enterprise might be affected by its presence as well if they are in direct business contact with it. This includes companies that supply or provide services for foreign firms, as well as companies that are supplied by foreign firms, which might improve the domestic companies' efficiency and performance. If foreign multinationals supply intermediate inputs to domestic firms, then it is called Forward Vertical spillover and if domestic firms supply its output to downstream foreign multinationals, then it is known as Backward Vertical spillover (Choe, 2003).

Impacts of Fdi Inflows on Productivity

When a FDI inflow comes to a country it has significance impact on productivity. FDI inflows raise the productivity of the host economy particularly in the case of developing economies (Chakraborty and Basu, 2002). As FDI results in a direct injection of capital and technology, the FDI-receiving companies are expected to perform better than local companies. In addition to this direct effect of FDI, there are also various spillover effects of FDI on local firms. In this case, FDI can generate a beneficial transfer of know-how and technology. In fact, an injection of capital and technology in domestic firms certainly stimulates competition in the local markets, if the initial difference in technology between foreign firm and the domestic firms are large and human capital is poor. In this situation, the foreign firms will stranglehold the local unproductive

competitors. In case, the technology gap is moderate and human capital is strong in the domestic firms, it will increase the competition and increase productivity catch-up of local firms. FDI inflows also enhance efficiencies because it uses advanced and sophisticated modern technology. New technology enhances efficiency of the firms. Efficient firms economically optimise production and allocation of resources. There is a huge debate in literature that MNCs are more efficient compare to domestic firms. So FDI firms generate more efficiency in domestic firm as well as in own firm.

The relationship between FDI and domestic investment is likely to be complimentary when investment is in an under-developed sector of the economy (i.e. owing to technological factors or lack of knowledge of foreign markets). In fact, the FDI is more likely to substitute for domestic investment, when it takes place in sectors where there are plenty of domestic firms or when domestic firms already have access to technology that the foreign firms bring into the country. In case FDI does not displace domestic investment, it may not stimulate new downstream investments in the domestic production and therefore, it might fail to exert CI effects on domestic investment.

Studies on impact of FDI inflows organized into five sections. Section one has devoted to analyze studies on impact of FDI inflows on productivity before Globalization period. Section two presents studies on impact of FDI inflows on productivity after Globalization period. Section three gives summary of impact of FDI inflows on productivity. Section four showcase some research issues raised from literature review of impact of FDI inflows on productivity. Lastly, section five gives the scope for further research.

Pre Globalisation Era Studies

A number of studies have been attempted to examine impact of FDI inflows on the productivity of domestic firm during pre globalization period. The results of the studies show varied evidence across the world. Despite the theoretical assumptions of positive impact of FDI inflows on the productivity of domestic firm, the empirical results of earlier studies are mixed, i.e. positive and negative.

A study conducted by **Kathuria (2001)** on Indian economy shows that impact of foreign direct investment on productivity is positive. The study used panel data for 368 medium and large size Indian manufacturing firms for the period 1975-1976 to 1988-1989. This study also used stochastic production frontier technique and panel data technique to test impact of foreign-owned firm on productivity of domestic firms. The results indicate that there exists positive effects from the presence of foreign-owned firms but the nature and type of spillovers vary depending upon the industries to which the firms' belong to. There exist significant positive spillovers for domestic firms belonging to the 'scientific' subgroup provided the firms themselves possess significant R&D capabilities. However, for non-scientific subgroup presence of foreign firms itself forces the local firms to be more productivity by inducing greater competition. It is clear from above analysis that author reported a significant impact of FDI inflow on productivity for Indian economy during 1975-76 to 1988-89.Major pitfall of this study is author did not take data of all the sector of the Indian economy, hence his analysis is not very much holistic. Perhaps, instead of grouping his study to two sub group such as: scientific and non-scientific author would have made it manufacturing and non-manufacturing for better policy implication of his results. Author would have also analyzed about backward and forward linkages in his study for better understanding on the impact of FDI inflow on productivity.

Later a study by Atiken and Harrison (1999) estimated the impacts of FDI inflow on productivity growth using panel data for Venezuelan manufacturing firms for the period 1975-1989. The study found foreign firms exhibited higher labor productivity. After controlling for size and capital intensity, the foreign firms are found to be higher in import and export intensity and paid higher wages than their domestic counterparts, and also foreign firms are found higher contributor to the foreign exchange earnings compared to the their domestic counterparts. The most important conclusion of the study is that although results strongly support the relation between increased foreign equity participation and individual firms' performance, but this increase in foreign ownership variable has a significant negative impact on domestic owned firms, suggesting an increase in foreign investment decreases the productivity among domestic firms. Thus, productivity improvement as a result of technology gains is only limited to the firms that are directly in link to the foreign firms. The authors could have showed impact of FDI inflow on employment.

A similar study by Kokko (1994) on Mexican manufacturing industry shows that impact of foreign direct investment inflow on domestic productivity is negative. Author had collected cross section data for the year 1970 from Mexican census of manufactures. The analysis also offers some obvious policy conclusion for host country governments that wish to encourage foreign investment in order to benefit from technology spillovers. Efforts to promote FDI should perhaps focus on industries where local technological capability is already relatively strong, or where product differentiation and scale economies are not so significant that foreign firms can easily take over the whole market. It can be seen that impact of FDI inflow on productivity for Mexican manufacturing industry is negative. One of the pitfalls of the analysis is that author had only done cross sectional analysis for the year 1970, so this analysis seems to be a partial because it based on only one year data. Another shortcoming of this study is that author did not do horizontal or vertical spillover effect of FDI inflows. Perhaps, Author would have used some non-linear production function model for better result in his study. Again author would have used dummy variable model for capturing industry and time effect on productivity.

A similar study by Blomstrom and Wolf (1994) showed that impact of FDI inflow on productivity is positive. Where authors showed both value added and gross output per employees higher in FDI firms compared to domestically owned firms. Author used Simple OLS technique and time series data from 1980 to1991 for finding out impact of FDI inflow on productivity by using data on Mexican manufacturing industries. Though TFP margins in FDI firms found lower on account of higher capital intensities, the study concluded faster productivity growth and faster convergence of productivity levels happened in the sectors with higher level of foreign ownership. Authors could have used Cobb-Douglas or more refined production function for better result.

Another study by Haddad and Harrison (1993) on Morocco shows that impact of foreign direct investment inflow on productivity is negative in case of manufacturing sector. Authors had collected firm-level industrial survey panel data for analysis. In this study authors found evidence that dispersion of productivity is smaller in sectors with more foreign firms. However, authors

rejected the hypothesis that foreign presence accelerated productivity growth in domestic firm. The evidence suggested that foreign investment is associated with a one-time increase in domestic firm efficiency. However, higher level of foreign investment has not been associated with rising productivity among domestic firm. It can be observed that impact of FDI inflow on productivity for Maroco manufacturing industry is negative. One of the demerits of the analysis is that they had only done panel data analysis without doing different types of data set (time series and cross sectional) analysis which will reduce comparability of the study. Secondly, they did not take any variable in their model to capture backward and forward impact of FDI inflows. Possibly, author would have done some policy or economic analysis to show why negative spillover occurring where positive spillover is expected.

Against this, a study conducted by Blomstrom (1986) on Mexican economy showed that impact of foreign direct investment on productivity is positive in case of manufacturing sector. Author used data for 230 Mexican manufacturing industries in 1970 and 1975. Author found the entry of foreign firms had a significant effect on each industry's average productivity. However, it had no impact on technical progress in the least productivity firms in each sector. Author interpreted these findings as indicating that foreign entries into Mexico did not speed up technology transfer, but that FDI increased productivity and promoted efficiency by increasing competition. Author would have examined impact of FDI on employment, export and labour productivity.

Post Globalisation Era Studies

Similarly, a number of studies have been attempted to examine impact of FDI inflows on the productivity of domestic firm during post globalization period. The results of the studies show varied evidence across the world. Despite the theoretical assumptions of positive impact of FDI inflows on the productivity of domestic firm, the empirical results of earlier studies are mixed, i.e. positive and negative. It is very important to give a list of study undertaken so far in the following manner.

The study by Kosova (2010) on Czech Republic reported that impact of foreign direct investment on productivity is positive. Author used firm level data from 1994 to 2001 for the Czech Republic from the Amadeus database, which covers firms in Western, Central, and Eastern Europe and Russia. This paper analyzes the impact of foreign direct investment on the growth and survival of domestic firms. Author separated the two opposing effects of FDI –a negative crowding out and positive technology spillovers. Author used random and fixed effect model to analyze growth rates and log-normal and probit model to analyze firm survival. The results show evidence of both technology spillovers and a crowding-out effect. However, crowding out appears to be a short-term or static phenomenon: initial foreign entry increases the exit rates of domestic firms. Subsequently, however, the foreign sales growth increases both the growth rate and the survival of domestic firms. Dividing industries between low and high-export oriented suggests that this positive foreign growth effect represents domestic demand creation rather than export spillovers. From policy perspectives, this paper shows that FDI generates positive benefits for domestic firm, so countries should remove, not install, restrictions against FDI. The results also provide justification for transitional countries' granting investment incentives to MNCs. Author would have showed linkages of FDI inflows on Czech Republic through various channel.

Against this study by Gachino (2007) on Kenya shows that impact of foreign direct investment on productivity is negative in case of manufacturing sector. This paper examined the effect of foreign presence on firm level productivity in the Kenyan manufacturing industry employing "traditional" and "recent" methodologies both based on production function framework. Author used panel data for analysis. A detailed comparative behaviour between foreign and local indigenous firms showed that foreign firms dominated in virtually all the economic activities including productivity performance. Analysis of productivity determinants following traditional approach indicated a statistically significant role played by foreign presence on firm level total factor productivity thus, supporting spillover occurrence argument. However, results based on recent methodologies showed no effect of foreign presence on firm level total factor productivity hence failing to support spillover occurrence dictum. These results indicate that use of different methodologies even within the same theoretical framework can result in divergent findings. This notwithstanding, the paper further argues that use of productivity based methodologies largely masks the nature, actual processes and mechanisms through which spillovers occur. The paper therefore advocates for a "paradigm shift" in the spillover analysis techniques and recommends a broader approach with particular emphasis on technological innovations which takes into consideration learning, capability building and innovation. It is found that impact of FDI inflow on productivity for Kenya manufacturing industry is negative. One of the pitfalls of the analysis is that instead of using simple Cobb-Douglas production function the author could have used Data Envelopment Analysis (DEA) which could leads to measure productivity in better way. Probably author would have also added some variable for measuring vertical and horizontal spillover of FDI inflow on productivity for Kenya manufacturing industry.

An interesting study conducted by Lyer C.G (2006) on Indian economy shows that effect (horizontal and vertical) of foreign direct investment on productivity in Indian manufacturing industries are both positive and negative. Author has used a firm level data of Indian manufacturing industries during the period 1989-2004. Author used Cobb-Douglas production function for this study. He found that textile, paper, electrical machinery, and other transport are the industries with no spillover effect due to various linkages with foreign firms. Food products and motor vehicles are found to experience positive but lagged forward and horizontal spillovers. The wearing apparel industry shows evidence of positive forward spillovers, both contemporaneous and with a lag. Chemicals and fabricated metals, and optical instruments show negative horizontal spillovers, while rubber, plastic and television demonstrate positive backward spillovers. The basic metals industry seems to experience contemporaneous as well as lagged negative backward and forward spillovers. The results of the non-metallic industry are puzzling; it has positive contemporaneous horizontal spillovers and negative lagged horizontal spillovers. This industry is also found to be positively affected by lagged forward spillovers whereas contemporaneous forward spillover seems to have no effect. The machinery industry is found to be positively influenced by both contemporaneous as well as lagged horizontal spillovers, while it is negatively affected by both contemporaneous and lagged backward spillovers. In conclusion he had explained that presence of foreign firms leads to positive as well negative inter-industry spillover and positive as well as negative intra-industry spillovers in the Indian manufacturing industry. An important implication from this study is that FDI does not have uniformly beneficial or consistently negative impacts on the domestic economy or industry. The impact varies across industry, implying the need for industry-specific policy, which leads to take into account the strength or weakness of each industry, domestic and international markets size, and impact of the industry on factors of production in the country. A specific policy for each industry would be the way forward for better use of the economy's resources. Here, this study shows a notable impact

of FDI inflow on productivity for manufacturing industries in India. One of the drawbacks of this study is though various reasons for negative inter-industry spillovers are theoretically available, it is difficult to determine these empirically and more work is required to better understand this. Another demerit of the analysis is that they had only done panel data analysis without doing different types of data set (time series and cross sectional) analysis which will reduce comparability of the study.

A study by Bergman (2006) showed that firms with foreign ownership experience higher productivity than domestic firms. This means impact of FDI inflow on productivity is positive. Thus there is productivity gain for firms with foreign ownership. This means horizontal spillovers are positive in case of Indian pharmaceutical industry. The higher level of productivity for firms with foreign ownership indicates that a small productivity gap exists between the domestic and foreign firms. Author also found that vertical spillovers are positive in case of Indian pharmaceutical industry but statically insignificant. He used panel data for year 2004 and OLS technique for this study. Lastly, to check the normal distribution of the residuals, the Jarque-Bera test is carried where author showed a normal distribution. It is comprehensible from above analysis that author reported some significant impact of FDI inflow on productivity for pharmaceutical industry in India. In this study author had found that horizontal and vertical spillovers are positive in case of Indian pharmaceutical industry. One of the pitfalls of the analysis is that they had only done panel data analysis without doing different types of data set (time series and cross sectional) analysis which will reduce comparability of the study. Probably author would have got significant result in case of coefficient F_Sector_{it} if he would have consider all firm of the pharmaceutical industry or if he would have consider a different proxy for measuring vertical spillover effect. Another demerit of this study is that he had taken only one year for analysis which is not sufficient to conclude about impact of FDI inflow on other industries.

A study conducted by Sasidharan (2006) on Indian economy shows that effect (horizontal and vertical) of foreign direct investment on productivity in Indian manufacturing industries are negative. Author used a firm level data of Indian manufacturing industries during the period 1994-2002. Author investigated both the horizontal and vertical spillover effects associated with the FDI. The study used data obtained from the PROWESS database provided by the Center for Monitoring Indian Economy (CMIE). Author also used the input-output table for the year 1998-99 provided by the Central Statistical Organisation (2005). Author had taken 2720 firm as his sample size. For the present study all those firms having foreign equity greater than 10% of the total equity are classified as foreign firms. He had also followed the model proposed by Aitken and Harrison (1999) to examine whether the foreign firms are more productive. Author used an augmented production function to examine the effect of foreign ownership on firm productivity within a region or an industry. In addition to that Author had also provided a summary of the selected studies carried out on productivity spillovers based on cross-sectional or panel data from developing and transition economies. Summary of the studies on impact of FDI on productivity are of given below.

Table 1: Literature Review on Impact of FDI Inflows on productivity

Authors	Data	Year	Level of Aggregation	Country	Impact on Productivity
Narula and Marin (2005)	panel	1992- 2001	micro	Argentina	+
Merlevede and Schoors (2005)	panel	1996- 2001	micro	Romania	-
Javorick and Spatareanu (2004)	panel	1998- 2000	micro	Romania	+
Siddharthan and Lal (2004)	panel	1993- 2000	micro	India	+
Yudeva et al. (2003)	panel	1993-97	micro	Russia	+
Schoors and van der Tol (2002)	c.s	1997/1998	micro	Hungary	+
Kathuria (2001)	panel	1976-89	micro	India	?
Djankov and Hoekman (2000)	panel	1993-96	micro	Czech Rep.	-
Aitken and Harrison (1999)	panel	1976-89	micro	Venezuela	-
Blomstrom and Sjoholm (1999)	c.s	1991	micro	Indonesia	+
Kokko (1994)	c.s	1970	ind	Mexico	+
Haddad and Harrison (1993)	panel	1985-89	micro	Morocco	?
Blomstrom and Wolf (1986)	c.s	1970/1975	Ind	Mexico	+
Blomstrom and Persson (1983)	c.s	1970/1975	Ind	Mexico	+

The study reveals a remarkable impact of FDI inflow on productivity for manufacturing industries in India where, Author had found that horizontal and vertical spillovers are negative in case of Indian manufacturing industries. One of the pitfalls of the analysis is that for estimating his entire model he has taken different proxy variables which may not be the correct for the analysis. Perhaps, author could have used stochastic frontier model for better result in his study.

A study by Wei and Liu (2006) on Chinese economy shows that impact of foreign direct investment on productivity is positive in case of manufacturing sector. Authors had taken panel data of more than 10,000 indigenous and foreign-invested firms for year 1998-2001. Differently from the existing literature, this paper combines the three major channels of productivity spillovers into a single framework, compares the seven alternative measures foreign presence, and provides a principal component that explains more than 66% of the variance of these seven indicators to confirm the positive spillover effects. All this should significantly enhance our understanding of productivity spillovers. It is apparent from above analysis that authors reported a noteworthy impact of FDI inflow on productivity for Chinese economy during 1998-2001. Major drawback of this is that authors have not considered horizontal and vertical spillover of FDI Inflow. Possibly authors would have done a comparative analysis of India and china for showing directions why impacts are different.

A study by Sarkar (2006) on Indian economy shows that impact of foreign direct investment on productivity is positive. Author had used detailed published firm-level panel data for 14 different types of Indian industries from Capitaline data base provided by Capital Market Ltd., an Indian

information services firm for the period 2002-2006. This study examines the relationship between foreign direct investment in an industry sector and productivity of domestic firms in the same industry sector. This study primarily focuses on the following research questions. At first, the study measured the effects of foreign direct investment (foreign ownership) on firms' output in 14 different types Indian industries and second, it empirically assessed whether foreign ownership in these identified industry sectors affects the productivity of domestic firms in that industry, viz., whether there is any evidence of spillovers to domestic firms from the foreign entrants in those industries. The third important feature observed in this study was in particular related to the spillover of superior technology to domestic firms, in case, inward investment involves superior technology. The interesting phenomenon suggested by the results from this study is that foreign investment in a firm significantly and positively increases the firm's output and productivity. In contrast to this, the firms with no foreign investment (domestic firms) are found to be less productive in sectors with more foreign investment compared to those firms in sectors with relatively smaller foreign presence. It is evident from above analysis that authors reported a remarkable impact of FDI inflow on productivity for Indian economy during 2002-2006. Major shortcoming of this study is author did not consider backward and forward linkages of FDI inflow. Perhaps, author would have included more sectors instead of only 14 for better and holistic result.

A similar study conducted by Banga (2004) to examine the spillover effects of Japanese and US foreign direct investment on total factor productivity growth. The analysis is carried out for the Indian manufacturing sector and productivity growth in Japanese-affiliated, US-affiliated and domestic firms is compared in three broad industrial categories, where both Japanese and US firms are significantly present, namely, automobiles, electrical and chemicals, for the period 1993-94 to 1999-2000. Estimations are undertaken at three levels. First, total factor productivity growth (TFPG) is estimated by using the 'time-variant firm specific' technical efficiency approach (parametric approach) and average TFPG in Japanese affiliated firms is compared with that in US-affiliated and domestic firms. Second, the impact of the source of affiliation on the TFPG of a firm is estimated using least square regressions on seven year averages. Finally, to investigate to what extent inter-firm differences exist in explaining TFPG and to what extent TFPG in a firm is explained by technical progress and efficiency growth, data envelopment analysis (non-parametric approach) is carried out and Malmquist indices are estimated using panel data in the three industries. In order to estimate productivity growth rates at the firm level, he had collected data from corporate database Capitaline, produced by Capital Markets. The analysis is based on the panel data for 276 firms. It is understandable from above analysis that author reported some exciting impact of FDI inflow on productivity for Indian manufacturing sector during 1993-94 to 1999-2000. In this study he had found that Japanese affiliation has a significant positive impact on productivity growth in a firm while the impact of US affiliation is not found to be significant. The results also show that domestic firms have witnessed both efficiency growth as well as technological progress in the electrical and chemical industries in the post-reforms period. One of drawback of this study is that it has not considered horizontal and vertical spillover effect of FDI inflow. The result of the study cannot be generalized because it considered only three sector namely automobiles, electrical and chemical industries. It also only considered two source of FDI inflow into India that is USA and Japan which cannot give holistic view of FDI impact on productivity.

The study by Gorg and Greenaway (2004) reported that impact of foreign direct investment on productivity is positive. In addition to that Authors had also provided a summary of the selected studies carried out on productivity spillovers based on cross-sectional or panel data from

developed, developing and transition economies. Summary of the studies on impact of FDI on productivity are of given below.

Table 2: Studies on Impact of FDI Inflows on productivity

Authors *Developing Economics*	Country	Period	Data	Aggregation level	Impact on Productivity[2]
1. Blomstrom & Persson (1983)	Mexico	1970	Cross-sectional	Industry	+
2. Blomstrom(1986)	Mexico	1970/1975	Cross-sectional	Industry	+
3. Blomstrom &Wolff (1994)	Mexico	1970/1975	Cross-sectional	Industry	+
4.Kokko (1994)	Mexico	1970	Cross-sectional	Industry	+
5.Kokko (1996)	Mexico	1970	Cross-sectional	Industry	+
6.Haddad & Harrison (1993)	Morocco	1985-89	Panel	Micro	?
7.Kokko et al.(1996)	Uruguay	1990	Cross-sectional	Micro	?
8.Blomstrom & Sjoholm (1999)	Indonesia	1991	Cross-sectional	Micro	+
9. Sjoholm (1999)	Indonesia	1980-91	Cross-sectional	Micro	+
10. Chuang & Lin (1999)	Taiwan	1991	Cross-sectional	Micro	+
11.Aitken & Harrison (1999)	Venezuela	1976-89	Panel	Micro	-
12.Kathuria (2000)	India	1976-89	panel	Micro	?
13. Kokko et al. (2001)	Uruguay	1988	Cross-sectional	Micro	?
14.Kugler (2001)	Colombia	1974-98	Panel	Industry	?
15.Lopez-Cordova (2002)	Mexico	1993-99	Panel	Micro	-, ?
16.Gorg & Strobl (2002)	Ghana	1991-97	Panel	Micro	+
Developed Economics					
17. Caves (1974)	Australia	1966	Cross-sectional	Industry	+
18.Globerman (1979)	Canada	1972	Cross-sectional	Industry	+
19.Liu et al. (2000)	United Kingdom	1991-95	Panel	Industry	+
20.Driffied (2001)	United Kingdom	1989-92	Cross-sectional	Industry	+
21.Girma et al. (2001)	United Kingdom	1991-96	Panel	Micro	?
22.Girma & Wakelin (2001)	United Kingdom	1980-92	Panel	Micro	?
23.Harri & Robinson (2004)	United Kingdom	1974-95	Panel	Micro	?

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[2] Micro data are at the firm or plant level data, + indicates positive and statistically significant, - indicates negative and statistically significant, and ? indicates statistically insignificant results.

A different type of study by Goldar et al. (2003) empirically estimated the impact of foreign ownership on efficiency by employing a limited panel data of Indian engineering firms during 1990-91 to 1999-2000. Using stochastic production frontier, the study found higher productivity among foreign firms compared to domestic private and public sector enterprises. The study also found indications of a process of efficiency, implying domestic firms, in the liberalization period, tending to catch up with foreign firms in terms of productivity. The study could have examined impact of FDI on employment and growth.

A different type of study conducted by Pradhan (2001) on Indian economy shows that impact of foreign direct investment on productivity is positive but not statistically significant. In other words, even though contribution of FDI stock to output is positive over the sample period, it is not substantial. To examine the impact of foreign direct investment on Indian economy during the period 1970-71 to 1996-97 he had taken Cobb-Douglas production function. Results for the total sample 1969-97, indicate that the estimated partial output elasticities with respect to domestic capital stock and labour had been anticipated positive sign and are statistically significant. The output elasticity of domestic capital stock is 0.8735 and thus, over the study period, a one percent increase in the domestic capital stock led on the average a 0.9 percent increase in output, holding FDI stock and labour input constant. The output elasticity with respect to labour (0.2446) is lower than that for the domestic capital stock and suggests that the contribution of domestic capital accumulation to output is relatively larger than that of labour. Over the same period, the output elasticity of FDI stock was observed to be positive (0.0178) but statistically insignificant. In other words, even though contribution of FDI stock to output is positive over the sample period, it is not substantial. This is understandable, given the fact that FDI stock accounts for less than 1 percent of domestic capital stock and is obviously not able to significantly contribute to the economy's output. In terms of the F-statistic, the estimated model is highly significant.

That means all the estimated slope coefficients are jointly significant. Further, in terms of overall fit as indicated by the adjusted R-squared these estimates are remarkable. The output elasticity of FDI stock has been consistently positive over different period estimation, Importantly, this is observed to be statistically significant over the period 1986-97 but is not so in the case of 1970-85. Therefore, the contribution of FDI stock to the economy's production is significantly positively during the liberalised phase of FDI regime. In conclusion he had stated that economic role of FDI is increasingly becoming significant in the Indian economy with the transition of FDI policy from a restrictive phase of seventies and early eighties to a relatively liberal phase of the eighties and nineties. It is understandable from above analysis that author reported some interesting impact of FDI inflow on productivity for Indian economy during 1970-71 to 1997-98. In this study he had found that impact of foreign direct investment on productivity is positive but not statistically significant when he has considered time period 1970-71 to 1997-98 but that turned to significant when he has considered time period 1986-97. This could be due to liberalization effect on Indian economy. One of pitfall of this study is that it did not considered horizontal and vertical spillover effect of FDI inflow. Perhaps, author would have applied instrumental variable for better result.

A different type of study by Siddharthan and Lal (2001) on Indian economy shows that impacts of foreign direct investment on productivity in initial year of liberalization were modest but later on increased sharply and stabilized towards the end. However, not all domestic firms gained equally from the FDI inflow. Domestic firms that possessed higher labour productivities and had lower productivity gaps with MNE were able to enjoy higher spillovers while those with larger

productivity gaps could not benefit much.. Authors had done both time series and cross sectional analysis with the help of OLS technique, random effect model and fixed effect model. In this study author had found that impact of foreign direct investment on productivity is positive but it is time dependent for that reason its impact was less positive in the initial period of liberalization then it increased after some time. One of pitfall of this study is that it did not considered horizontal and vertical spillover effect of FDI inflow. Perhaps, author would have taken service sector also with manufacturing sector in order to know how it affect service sector in India after globalization.

Another study by Liu et al. (2000) on UK economy shows that impact of foreign direct investment on productivity is positive. Authors used panel data for 48 UK industries over the period of 1991-1995. They divided local UK firms into two groups: one having a "strong" capability, and one having a "weak" capability. Authors employed a single equation and regressed labor productivity with other variables, such as capital labor ratio, and average size of UK-owned firms. The results indicated that the mere presence of FDI has a positive spillover impact on the productivity of UK-owned firms. It also showed that the extent to which local firms benefit from the introduction of advanced technology depends largely on their own technological capabilities as defined by UK firms' capital intensity, learning effects and technological capabilities. Author would have also analyzed about backward and forward linkages in his study for better understanding on the impact of FDI inflow on productivity.

Another study by Djankov and Hoekman (2000) found that impact FDI inflow on productivity a positive for Czech Republican manufacturing firms. For this study authors used firm level panel data for the period 1992-1996. The study has segregated all manufacturing firms at three levels; the firms with FDI(Foreign affiliates), firms without FDI but having joint venture(Foreign partners) and firms with no such foreign link. The study found foreign investment has a positive impact on the TFP growth of recipient firms. FDI firms have exhibiting greater TFP growth than joint venture firms implying that patent firms are more interested to transfer technological know-how to their foreign affiliates than their joint ventures partners without any FDI. This is obvious because technology transfer is batter protected against leakage in a firm where the parent firms have a control over the management and production. Further, it is found that FDI firms and joint ventures firms together, have a negative effect on the domestic firms, thereby, suggesting no spillovers. This effect is found to be large and statistically significant. However, it focus is shifted to estimate the impact of only FDI firms on both joint venture and domestic firms then this negative effect becomes smaller and loses statistical significance. Further, importantly, the study pointed out the inadequate training efforts on part of domestic firm would have prevented them in absorbing or benefiting from the diffusion of technology transfer. Authors could have examined horizontal and vertical spillover of FDI on Czech Republican manufacturing firms.

Against this, a study by Okamoto (1999) on United States economy reported that impact of foreign direct investment on productivity is negative. Author used firm-level data for Japanese investment in the U.S. auto parts industry from 1982 to 1992. The study made three major findings. First, contrary to expectation, Japanese-owned firms were found to be less productive than their U.S. counterparts, at least in 1992. Firm-specific technological and managerial advantages were not revealed in the U.S. market. Second, U.S owned independent suppliers improved their performance steadily between 1982 and 1992. Third, technology transfer from Japanese assemblers to US-owed suppliers seems to explain only a small part of their improvement in performance. The improvement in productivity observed in the 1980s and in the early 1990s appears to have been the result of increasing competitive pressure rather than

technology transfer. Author could have used panel data techniques for comparing impact of FDI on different sectors of United States economy.

The study by Chuang and Lin (1999) examined the impact of FDI, R& D on productivity and spillover of efficiency in case Taiwan's manufacturing firms. The study has empirically analyzed the impact of FDI in increasing firms' productivity, the role of R&D in increasing investing firms' productivity and spillover of efficiency to other firms in the industry and finally the relationship between FDI and R & D activities. The study used two measures for estimating TFP at firm level; (a) under constant return to scale assumption and (b) second based on the assumption of variable returns to scale. The results of the study confirmed the evidence for positive impact of FDI and R &D on productivity and spillover of efficiency to domestic firms. The study, after correcting for sample selection bias derived the important conclusion that local technology purchase and outward foreign investment are substitute to R & D activities. The author could have used impact of FDI on labor productivity for better understanding of Impact of FDI.

Summary of The Review

Despite the theoretical assumptions of positive impact of FDI inflow, the empirical results of earlier studies of FDI impact on the productivity of domestic firms are mixed in case one positive; Kosova (2010), Bergman (2006), Lyer (2006) Wei and Liu (2006), Sarkar (2006), Banga, (2004), Gorg and Greenaway (2004), Goldar et al. (2003) Lipsey (2002), Kathuria (2001), Siddarthan (2001), Pradhan (2001), Djankov and Hoekman (2000), Liu et al. (2000), Chuang and Lin (1999), Blomstrom and Wolf (1994), Blomstrom (1986) and secondly, it is Negative: Gachino (2007), Sasidharan (2006), Atiken and Harrison (1999), Okamoto (1999), Kokko (1994), Djankov and Hoekman (1994), Haddad. and Harrison (1993). Some authors argue that FDI can have negative effects on the domestic firms' productivity, which may be large enough to offset the positive impact from FDI.

Large number of studies has appeared in the recent years on the impact of FDI on host country firm productivity growth through spillovers. The studies pertain to developed, developing and transition economies using both cross sectional and panel data. The pioneering studies (Caves 1974; Globerman 1979; Blomstrom and Persson, 1989) using cross-sectional data mostly found evidence of positive effects. However, these studies were criticized for the reason that they were unable to take into consideration the industry and time effects. The evidence of positive spillover from foreign subsidiaries may be due to the possibility that MNCs tend to invest in high productivity industries. The availability of panel data has enabled the researchers to rectify the shortcomings of using cross-sectional data. Studies undertaken with the panel data reveal negative or insignificant effects (Aitken and Harrison 1999, Djankov and Hoekman 2000). Some of the studies based on panel data show positive effect but depending on certain factors like the absorptive capacity and the extent of the technology gap between domestic and foreign firms (Kokko,1994).

Research Issues Raised

It is seen from the literature review that impact of FDI inflow on productivity is mixed: positive and negative. Even though a few studies are available regarding impact of FDI inflows on productivity in India after reform but they seem to be dated in the present context. Therefore a need for an update is now felt regarding impact of FDI inflows on productivity in Indian economy using more recent data at different sectoral level. Further, it is important to examine whether impact of FDI on productivity changed at a particular historical juncture (after 1990) where some decent economic growth has already taken place and the economy is well poised on a growth

trajectory. It would be interesting to examine sources of productivity growth of FDI firms in India after liberalisation.

Scope for further Research

By way of pointers to future research, it is suggested that sector level impacts of FDI inflows study can be conducted for finding sector specific impacts. A comparative study with references to qualitative and quantitative impacts may be reviewed. A comparative study with reference to China or any of the emerging economies may also be attempted.

Conclusion

This study finds that there are several explanations for the mixed results of earlier studies such as different measuring techniques and unreliable data used in the studies (Görg and Strobl, 2001). The varied results are also argued to depend on characteristics of the host country and the investing firms. Explanations such as "absorptive capability" of the host economy, domestic market competition, ownership structure of foreign firms and technology gap between foreign and domestic firms in the industry can explain the different outcomes. Absorptive capability refers to the fact that FDI may be more beneficial for an industry if the domestic firms have a minimum level of technological development and human capital (Blomström and Kokko, 2003). Due to competition effects foreign firm can lead to crowding out of domestic firms those firms, which are unable to compete with the foreign firms are forced to make an exit which is known as market stealing effect. Therefore in the short run, the productivity of the domestic firms' decline which shows that impact of FDI inflow has negative effect. The argument about positive competition effects hold only if domestic firms are not far below the technological frontier. On the other hand, in an industry characterized by weak firms, the entry of foreign firms may eventually lead to an exit of the weak domestic firms which is the main cause for negative spillover effects. It is a fact that spillovers are more likely in the case of inter-industry than within the same industry. The reason behind such a belief is that, MNCs can prevent the leakage of technology to its competitors while it has no incentive to prevent the technology diffusion to its suppliers and clients. Hence vertical spillovers are negative here. When MNCs prefer to source from their international supplier, the domestic firms will have to upgrade their technology in order to meet the global demand. Those supplying firms failing to meet the requirements of the MNCs or unable to meet the import competition will be forced to exit from the market. As a result a negative vertical spillover can arise in such an eventuality.

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Comparative Impact of Recession on Determinants of Stock Prices of BSE Listed Companies

Sunita Sukhija* and Arti Gaur**

Abstract

A slowdown in the US economy was definitely a bad news for India because Indian companies have major outsourcing deals from the US. India's exports to the US have also grown substantially over the years. Recession is a phase in which rupee depreciate, cash crunches, money market slowdown, inflation comes. The objective of this paper is to compare the impact of fundamental factors on Stock prices of BSE 200 companies in normal period and recession period. A sample of eighty companies was selected for the purpose of the study. The panel data techniques, viz. Fixed Effects model and Random Effects model have been employed to investigate the objective. The empirical results reveal that Book Value, Earning Per Share and Growth are the important determinants of share prices for normal period from 1st April 1998 to 31st March 2000. Book Value, DPS and Cover are being the important determinants of share prices for the recession period from 1st April 2000 to 31st March 2002. Earning Per Share and Cover are being the important determinants of share prices for the normal period from 1stApril 2002 to 31st March 2007. Price Earning Ratio and Growth are being the important determinants of share prices for the recession period from 1st April 2007 to 31st March 2009. Price Earning Ratio, Book Value and ROCE are being the important determinants of share prices for the normal period from 1st April 2009 to 31st March 2013.

Key Word : Recession, Fundamental, Fixed Effect Model, Random Effect Model.

JEL Classification: E32, F21, G15

Introduction

According to an old proverb *"When the US gets Cold, the rest of the World gets Pneumonia"* in the global economy. With the increasing relation of the Indian economy and its financial market with rest of the world, the country does face some problems from international growth. A country is called into recession in which a nation's Gross Domestic Product or output continues into a negative growth of at least two consecutive quarters or maintain for six months. Recession is a phase in which rupee depreciate, cash crunches, money market slowdown, inflation comes. According to International Monetary Fund, Recession means decline in annual per capita real World GDP (purchasing power parity weighted), backed up by a decline or worsening for one or more of the seven other global macroeconomic indicators: industrial production, trade, capital flows, oil consumption, unemployment rate, per capita investment, and per capita consumption.

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The industries most affected by weakening demand were IT, airlines, hotels, real estate. Besides this, Indian exports suffered a setback and there was a setback in the production of export-oriented sectors. US recession spilled over in India in financial as well as real channels. Because of limited exposure, India was not directly affected by the US recession. Indian economy has not been hurt by the global financial recession, and India was in better position with quick recovery and for future growth than many of the other economics as Indian banks did not have significant exposure to sub-prime loans in the US. So the recession was started in US and it has only touched the boundary of India. Although at one time it was thought that this crisis would not affect the Indian economy, later it was found that the Foreign Direct Investment (FDI) started drying up and this affected investment in the Indian economy.

Literature Review

The link between fundamental factors and share price changes has been extensively investigated in the financial literature. Irfan and Nishat (2000) investigated the combined effect of numerous factors on market prices of shares in Karachi Stock Exchange of listed firms during 1981to 2000. Out of six fundamental factors, only four i.e. payout ratio, size, leverage and yield had impact on share prices at KSE. Tuli, Nishi and Mittal (2001) attempted to determine the price earning ratio of 105 companies for the period 1989-93 using cross sectional analysis. Variability in market price, dividend payout ratio and earnings per share were found to be significant whereas size, debt equity ratio and growth were insignificant. Kanwal and Kapoor (2008) conducted a study in which dividend decisions of an organization is affected by cash flows, sales growth, market to book value ratio and corporate tax. The results have focused on recognizing whether various factors available affect dividend payout ratio in IT sector or not. The main objective of the study was to identify the various factors that affect the dividend payout policy decisions of selected IT firms. Srivastava (2010) concluded that emerging economies like India in long term are more affected by domestic macro economic factors than global factors. The main domestic macroeconomic factors affecting the stock market in long run are industrial production; wholesale price index and interest rate. Mandal and Bhattacharjee (2012) identified substantial change in behavior of the SENSEX from the outbreak of the recession. With the onset of the recession, there was substantial increase in volatility in the Indian equity market. In order to explore the impact of the foreign stock markets on SENSEX, it has been analyzed that the nature of contagion among the US, European, Asian and Latin American markets. During pre-recession period, the Indian market is found to be insulated from the world market. It seems that country specific and to some extent regional factors dominate the SENSEX during periods of relative economic stability. Rasimavicius (2013) indicated that fundamental factors are more effective than economic factors in accounting for the cross-sectional variation in asset returns. It has been perceived that fundamental factors enable a more complete understanding of asset returns than economic variables This research specified that the ability to forecast returns to fundamental factors perfectly is more valuable than the ability to forecast macroeconomic variables perfectly.

Objective of the study:

The main objective of this study is to compare the impact of fundamental factors on stock prices of BSE 200 companies in normal period and recession period.

Hypothesis of the study:

H_{01} - There is no significant impact of fundamental factors on stock prices during normal and recession period.

Scope of study

Fundamental Factors

Eight Key variables such as: Book Value Per Share (BV), Dividend Per Share (DPS), Earnings Per Share (EPS), Cover (C), Payout Ratio (P), Price Earning (P/E), Return on Capital Employed (ROCE) and Growth (G) have been included in the study.

Sample Profile

To examine the hypothesis, the study has used secondary data. The yearly data has been used on the concerning aspect, a sample of eighty companies was selected for the purpose of the study which are listed on the Bombay Stock exchange.

Time period

The study is based on fifteen financial years i.e. from 1st April 1998 to 31st March 2013. To study the impact of recession on stock price and key variables during the recession period, the whole study period has been divided into five parts. The first part includes the normal period of two years from 1st April 1998 to 31st March 2000. The second part comprises the recession period of two years from 1st April 2000 to 31st March 2002 and third part consists of the normal period of five years starts from 1st April 2002 up to 31st March 2007. The forth part covers the recession period of two years from 1st April 2007 to 31st March 2009 and fifth part consists of the normal period of four years starts from 1st April 2009 up to 31st March 2013.

Data Collection

The data relating to the companies which are listed in BSE 200 has been collected on yearly basis from updated version 'PROWESS 4' database of the Centre for Monitoring Indian Economy and Bombay Stock Exchange Official Directory.

Model Specification

The panel data techniques, viz. Fixed Effects model and Random Effects model have been employed to investigate the objective.

Fixed Effect Model - This model allows for heterogeneity or individually among 80 companies by allowing having its own intercept value. Another term fixed effect is due to the fact that although the intercept may differ across different companies but intercept does not vary over time, it is time invariant.

Random Effect Model - In this model, all the 80 companies have a common mean value for the intercept. In ECM it is assumed that the intercept of an individual unit is a random drawing from a much larger population with a constant mean value.

Hausman Test - This test is used to check which model (fixed effect or random effect model) is suitable to use. If p value found statistically significant, then fixed effect model will be used otherwise random effect model will be suitable.

Empirical Results

In this study, comparative analysis of normal and recession has been comprised to find out effect of key variables on equity share prices of Indian companies that are listed in BSE 200. Table 4.1 displays the results of panel data regression for the normal period from 1st April 1998 to 31st March 2000. The results of Hausman test provided evidence in favour of random effects model for normal period. The empirical results reveal that the Book Value has positive and significant impact while EPS has a negative and significant impact on the share price at 5 percent level of significance and Growth is the positive and significant determinant at 1 percent level of significance. The variables PER and ROCE have a positive relationship with share price but are statistically non-significant. However, the DPS, Cover and DPR have a negative impact on share price and are insignificant. The study results suggest that Book Value, Earning Per Share and Growth are the important determinants of share prices for the normal period.

Table 4.1 Fundamental Determinants of Equity Share Price of all Sample Companies in Normal Period (1998-2000)

Model Variables	Fixed Effect Model		Random Effect Model	
	Coefficient	t-value	Coefficient	t-value
Constant	208.2420	0.569357	410.4993	2.664086
Book Value	2.5107**	0.865757	0.8995**	0.910818
DPS	-0.680481	-0.014912	-19.59559	-0.611284
EPS	-10.434**	-0.968706	-6.7128**	-1.149134
Cover	0.979512	0.461113	-0.212400	-0.140796
DPR	43.62703	0.352705	-58.65864	-0.557788
PER	-1.803014	-0.562427	0.451339	0.214520
ROCE	6.998029	0.445667	0.193059	0.022004
Growth	0.7552	0.304050	3.8565***	1.893247
Hausman test (p-value)	10.01819(.2518)			

*significant at 1 percent level of significance, ** significant at 5 percent level of significance, *** significant at 10 percent level of significance, Source: All the numerical figures of table are calculated from eviews6 version*

Table 4.2 exhibits the results of panel data regression for the recession period from 1st April 2000 to 31st March 2002. The results of Hausman test revealed evidence in favour of random effects model for recession period. The empirical results reveal that the Book Value has positive and significant impact while DPS and Cover have a negative and significant impact on the share price at 5 percent and 10 percent level of significance respectively. The variable EPS, DPS, PER and ROCE have a positive relationship with share price and are statistically non-significant. However, Growth has a negative impact on share price and is insignificant. The study results suggest that Book Value, DPS and Cover are being the important determinants of share prices for the recession period.

Table 4.2 Fundamental Determinants of Equity Share Price of all Sample Companies in Recession Period (2000-2002)

Model	Fixed Effect Model		Random Effect Model	
Variables	Coefficient	t-value	Coefficient	t-value
Constant	-116.9829	-0.305609	325.8672	1.774068
Book Value	4.761663*	1.507576	1.33865*	0.834738
DPS	-18.13028	-0.297047	-71.3957**	-1.763775
EPS	-10.67552*	-0.792372	2.012957	0.245141
Cover	3.280297	0.712133	-3.160013*	-1.035024
DPR	-11.40144	-0.015124	154.2350	0.344718
PER	1.438211*	1.015585	0.948887	0.813003
ROCE	6.214859	0.334001	3.779098	0.398477
Growth	-0.132757	-0.184056	-0.070869	-0.619357
Hausman test (p-value)	6.4407 (.5980)			

*significant at 1 percent level of significance, ** significant at 5 percent level of significance, *** significant at 10 percent level of significance, Source: All the numerical figures of table are calculated from eviews 6 version*

Table 4.3 Fundamental Determinants of Equity Share Price of all Sample Companies in Normal Period (2002-2007)

Model	Fixed Effect Model		Random Effect Model	
Variables	Coefficient	t-value	Coefficient	t-value
Constant	649.585	8.0016	667.161	6.5761
Book Value	0.3457	0.7866	0.2646	0.6294
DPS	-6.1463	-0.6489	-6.0763	-0.7033
EPS	1.679	0.8562	1.044**	0.5541
Cover	-1.817***	-1.7074	-1.5440***	-1.6172
DPR	-60.967	-0.7495	-53.834	-0.6771
PER	0.4070	0.9932	0.3287	0.8200
ROCE	3.3597	0.9454	1.5589	0.4899
Growth	-0.1468	-1.1470	-0.1235	-0.9784
Hausman test (p-value)	6.413806(.6010)			

*significant at 1 percent level of significance, ** significant at 5 percent level of significance, *** significant at 10 percent level of significance, Source: All the numerical figures of table are calculated from eviews 6 version*

Table 4.3 displays the results of panel data regression for the normal period from 1st April 2002 to 31st March 2007. The results of Hausman test revealed evidence in favour of random effects model for normal period. The empirical results reveal that the EPS has positive and significant

impact while Cover has a negative and significant impact on the share price at 5 percent level of significance. The variable BV, PER, and ROCE have a positive relationship with share price but are statistically non-significant. However, the DPS, DPR and Growth have a negative impact on share price and are insignificant. The study results suggest that Earning Per Share and Cover are the important determinants of share prices for the normal period.

Table 4.4 exhibits the results of panel data regression for the recession period from 1stApril 2007 to 31stMarch 2009. The results of Hausman test revealed that the difference in coefficients between fixed effects and random effects is systematic and provided evidence in favour of fixed effects model for recession period. The empirical results reveal that the PER has positive and significant impact while Growth has a negative and significant impact on the share price at 5 percent level of significance. The variable EPS and Cover have a positive relationship with share price and are statistically non-significant. However, the DPS, BV, DPR and ROCE have a negative impact on share price and are insignificant. The study results suggest that Price Earning Ratio and Growth are being the important determinants of share prices for the recession period.

Table 4.4 Fundamental Determinants of Share Prices of all Sample Companies in the Recession Period (2007-2009)

Model	Fixed Effect Model		Random Effect Model	
Variables	Coefficient	t-value	Coefficient	t-value
Constant	506.3989	1.789470	522.0392	3.068427
Book Value	-1.381127	-1.074433	-0.292430	-0.414447
DPS	-12.44184	-0.706007	-9.074563	-0.746753
EPS	2.699866	0.939573	1.667440	0.842618
Cover	0.883109	0.409890	0.293948	0.235601
DPR	-156.6743	-0.522456	225.7937	0.991496
PER	17.6432***	3.904553	7.45248**	2.517443
ROCE	-0.037996	-0.005092	-2.340172	-0.530513
Growth	-0.43768**	-2.252426	-0.36117**	-2.070206
Hausman test (p-value)	15.204454(0.0500)			

*significant at 1 percent level of significance, ** significant at 5 percent level of significance, *** significant at 10 percent level of significance, Source: All the numerical figures of table are calculated from eviews6 version*

Table 4.5 reveals the results of panel data regression for the recession period from 1st April 2009 to 31st March 2013. The results of Hausman test provided evidence in favour of random effects model for normal period. The empirical results reveal that the PER, Book Value and ROCE have positive and significant impact on the share price at 5 and 10 percent level respectively. However, the Cover has a negative impact on share price and significant at 10 percent level of significance.

Table 4.5 Fundamental Determinants of Share Prices of all sample Companies in the Normal Period (2009-2013)

Model	Fixed Effect Model		Random Effect Model	
Variables	Coefficient	t-value	Coefficient	t-value
Constant	602.2941	3.741329	704.1956	3.741329
Book Value	0.399051	0.528184	0.02301*	0.528184
DPS	4.939547	0.370476	6.269397	0.370476
EPS	0.277998	0.110864	0.516771	0.110864
Cover	-0.863628	-0.616216	-0.69846*	-0.616216
DPR	-5.207140	-0.023062	61.92135	-0.023062
PER	3.20400**	2.580466	3.09887**	2.580466
ROCE	8.74226	1.916682	5.13805***	1.916682
Growth	0.214224	0.113427	0.571456	0.113427
Hausman test (p-value)	10.428459(0.2362)			

****significant at 1 percent level of significance, ** significant at 5 percent level of significance, * significant at 10 percent level of significance, Source: All the numerical figures of table are calculated from eviews6 version*

The variable DPS, EPS,DPR and Growth have a positive relationship with share price and are statistically non-significant. The study results suggest that Price Earning Ratio, Book Value, ROCE and Cover are being the important determinants of share prices for the normal period.

Table: 4.6 Summary of Panel Data Regression Analysis of the Determinants of Market Share Price for Normal and Recession Period (1998-2013)

	Normal period			Recession Period	
Time duration	01-04-1998 to 31-03-2000	01-04-2002 to 31-03-2007	01-04-2009 to 31-03-2013	01-04-2007 to 31-03-2009	01-04-2007 to 31-03-2009
Model Specification	Random Effect Model	Random Effect Model	Random Effect Model	Random Effect Model	Fixed Effect Model
R-Square	66%	61%	68%	59%	56%
F-Value	7.36(0.00)	5.148(0.00)	19.510(0.00)	2.636(0.00)	8.0073(0.00)
Book Value	0.8995**	0.2646	0.0230***	1.338658	-1.381127
DPS	-19.59559	-6.0763	6.269397	-71.39579	-12.44184
EPS	-6.7128**	1.044**	0.516771	2.012957	2.699866
COVER	-0.212400	-1.544***	-0.6984*	-3.160013	0.883109
DPR	-58.65864	-53.834	61.92135	154.2350	-156.6743
PER	0.451339	0.3287	3.09887**	0.948887	17.6432***
ROCE	0.193059	1.5589	5.13805***	3.779098	-0.037996
Growth	3.8565***	-0.1235	0.571456	-0.070869	-0.43768**
Hausman Test	10.0181(0.2518)	6.413 (0.601)	10.428 (0.236)	6.4407(0.5980)	15.204 (0.050)

*significant at 1 percent level of significance, ** significant at 5 percent level of significance, *** significant at 10 percent level of significance, Source: All the numerical figures of table are calculated from eviews6 version*

Conclusions

In the first normal period from 01-04-1998 to 31-03-2000, Book Value, Earning Per Share and Growth are the important determinants of share prices. In the second normal period from 01-04-2002 to 31-03-2007, the study results suggest that Earning Per Share and Cover are the important determinants of share prices for the normal period. The third part of normal period contains the period from 01-04-2009 to 31-03-2013. PER, Book Value and ROCE have positive and significant impact on the share price at 5 and 10 percent level respectively. However, the Cover has a negative impact on share price and significant at 10 percent level of significance. The study results suggest that Price Earning ratio, Book Value, ROCE and Cover are being the important determinants of share prices for the Normal period. In the recession period from 01-04 2000 to 31-03-2002, the study results suggest that Book Value, DPS and Cover are being the important determinants of share prices for the recession period. In the second recession period, from 1ˢᵗApril 2007 to 31ˢᵗ March 2009 PER has positive and significant impact while Growth has a negative and significant impact on the share price at 5 percent level of significance. The variable EPS and Cover have a positive relationship with share price and statistically insignificant. However, the DPS, BV, DPR and ROCE have a negative impact on share price and are non-significant.

On the one hand, Liberalization, Privatization, Globalization (LPG) of the Indian Economy filled the resource gap but on the other hand, it has made the economy prone to shocks originating in the other parts of the world. Indian economy has been hurt by the global financial recession, but India was in better position with quick recovery and for future growth in comparison to many of the other economics as Indian banks did not have significant exposure to sub-prime loans in the US. RBI's decisions to appropriate use of a range of instruments such as CRR, Repo/Reverse Repo Rate, SLR, MSF and LAF are in the right direction and taken in time. The result of this experience is that India must exercise caution while liberalizing its financial sector.

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An Empirical Study on the Perception and Expectation of Customers for IT Enabled Banking Services

Bimal Jaiswal* and Noor Us Saba**

Abstracts

The banking today has become more advanced and innovative which could not be thought two decades before. The employment of technology in delivering banking services is becoming increasingly predominant as it is being paid for cost reduction and to manage uncertainties. In this post liberalization environment the banking in India has experienced terrific changes and is facing tough competition. In this era of competition and rivalry information technology has become the support of any business and so the information becomes its heart, which helps in gaining competitive edge, and the penetrating effect of information technology in collecting, combining and processing large volumes of information is ultimate. This research tries to bring out the growth of IT enabled services like- use of ATM's, debit cards, net banking, mobile banking and CRM in banking industry and investigate the service quality offered by the banks by measuring the customer satisfaction using SEVQUAL model. This model will help in identifying the gap between customer's expectations and perception. Data has been collected by using non-probability convenience sample through 100 valid questionnaires, paired sample t-test and independent sample test are applied to determine the Gap and significant difference between expected and perceived service. The information further can act as a motivator for gaining customer loyalty and gaining edge over competitors.

Introduction

Indian banking industry today is in the middle of an IT revolution. Over past 10 years the advance use of technology has been adopted in the delivery of services, service providers are being persuaded by the industry to make the use of technology so as to survive in this electronic era. The competitive and regulatory pressure has led to grater significance of automating the banking processes. In the post liberalization the banking industry has experienced many great changes, the challenging ongoing economic climate and shrink markets has created an environment of greatly increased competition, so in order to deal with the pressure banks are being forced into a transformation of business by adopting the IT, how they interact with customers is a prime focus during these transformation. The initial step undertaken by banks in providing the better services is automation of banking transactions which ensures 24*7 hours service to the customers without any interruption. The availability of plastic cards, net banking and mobile banking has bridges the gap between the customers and bank and has made interaction more effective. To enhance the performance and profitability Indian banking industry has geared up for embracement of new technologies. They have extended their boundaries from accepting deposits and lending advances to the needy one to many other services, now the major portion of profit comes from the spread between the deposits and advances; rate of interest. In the rivalry and deregulated environment the spread between two has been reduced to great extent. In order to have improved and quick customer service banks have adopted the technology at par with world class banking, with an aim to expand its ability to reach unbanked.

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The RATER Model – Service Quality Dimensions

The RATER Model was given by professors Valarie Zeithaml, A. Parasuraman, and Leonard Berry, and published in their 1990 book, "Delivering Quality Service."

The model highlights five areas that customers generally consider to be important when they use a service. These are:

Reliability – reliability is the ability to provide the service that has been promised consistently, accurately, and on time.

Assurance – assurance is the knowledge, skills, and integrity of staff; and their ability to use this competence to build trust and confidence among customers.

Tangibles – tangibles are the physical evidence or the materials associated with service. This could be offices, machines, employees, and the communication and marketing materials that are used by the service providers.

Empathy – empathy is the affinity between employees and customers. The caring individualized attention that is given to stakeholders.

Responsiveness – responsiveness is the ability to provide a swift, high quality service to the customers.

Literature Review

Over the past few years, there has been a substantial research on different dimensions of service quality leading to a sound conceptual base for both practioners and researchers. Parasuraman et al. (1985) proposed the gap model of service quality that determined service quality as the gap between expectation and performance perception of the customer. Service quality research has indicated that service quality has been increasingly recognized as a critical factor in the success of any business. He agrees that service quality is an abstract concept, difficult to define and measure. (Parasuraman et al., 1988), Later on, service quality has also been defined broadly as "consumers' assessment of the overall excellence or superiority of the service" (Zeithaml et al., 1993).and the banking industry in this case in not exceptional (Hossain & Leo, 2009). Service quality has been widely used to evaluate the performance of banking Services (Cowling & Nwman, 1995). The banks understand that customers will be loyal if they provide greater value (quality services) than their competitors (Dawes & Swailes, 1999), and on other hand, banks can only earn high profits if they are able to position themselves better than competitor within specific market (Davies et al., 1995). Levesque & McDougall (1996) pointed out that customer satisfaction and retention are critical for retail banks, and investigate the major determinants of customer satisfaction (service quality, service features, situational factors and customer complaint handling), and future intentions in the retail bank sector.

Objectives

➔ To investigate the e-service quality offered by public and private banks on the basis of generic SERVQUAL format of quality measurement.

- ➜ To identify the relative importance of the following service dimensions- Reliability, Assurance, Tangibility, Empathy and Responsiveness.
- ➜ Further the study tries to measure how well services are delivered and identify the gap between perceived and expected services if any.
- ➜ To find the gap between public and private banks services.

Methodology

A cross sectional descriptive research was undertaken to gain an accurate and deep understanding of customer perceived service quality offered by private and public banks. A generic SERVQUAL format, developed by Parasuraman, et al 1985 was used for the research. A structured questionnaire was administered to 100 respondents which were selected on basis of convenience sampling. The SERVQUAL instrument measures the five service dimensions- Reliability, Assurance, Tangibility, Empathy and Responsiveness. The questionnaire was divided into two parts- first part consist of demographic information (age, education, sex, occupation and income) and second part consist of twenty two question on above mentioned service dimensions. The responses were generated on 5 point Likert scale indicated as: 1- Strongly disagree, 2- Disagree, 3- Neutral, 4- Agree, 5- Strongly agree, to measure the expected and perceived service level.

Research Hypotheses

H0: There is no significant difference between service quality dimensions and customers satisfaction.

H0.1: There is no significant difference between reliability and customers' satisfaction.

H0.2: There is no significant difference between assurance and customers' satisfaction.

H0.3: There is no significant difference between tangibility and customers' satisfaction

H0.4: There is no significant difference between empathy and customers' satisfaction

H0.5: There is no significant difference between responsiveness and customers' satisfaction

Findings and Discussions

Analysis of Demographic Profiles of Respondent
Table 1 shows the demographic profile of respondent. The sample of bank customers consisted of more males (70 percent) than females (30 percent). 50% of the respondents were in age group of 20-40, 30% were between 41-60 age groups, 20% were above 60. With regards to educational qualifications 45% reported to be post graduates, 40% to be graduates, 10% and 5% to be intermediate and below intermediate respectively. In terms of occupational status 33% were students, 46% were service holders and 21% were businessmen.

Table 1: Demographic profile of respondent

Demographic variable	Category	Frequency
Gender	Male	70
	Female	30
Age	20-40	50
	41-60	30
	Above 60	20
Education	Post graduate	45
	Graduate	40
	Intermediate	10
	Below intermediate	5
Occupation	Student	33
	Service	46
	Business	21

Analysis of Service Quality

The analysis was done to examine prevailing e-service quality level in banking industry, with respect to the five dimensions of service quality: reliability, assurance, tangibles, empathy and responsiveness, Table 2 shows the scores in relation to each SERVQUAL item. As shown in table SERVQUAL score for all items except (Reliability- 4 &5, Tangibility- 4&5, Empathy- 1&5 and Responsiveness-1&3) are above 3.50 which indicate a good perception of banking e-service quality. The highest perception score of respondents belonged to the items: item-3: bank keeps the record accurately (4.3200), item-7: employees of your bank are polite and friendly (4.1800), item-20: bank charges reasonably for providing e-services (4.0200) and item-8: feel ATM's are secure to use (3.7800) and the lowest perception score of item were: item-18: bank gives individual attention to each customer (3.0400).

Table 2: Average Means & Rank for Five Dimensions of Service Quality

Sr. No.	Reliability	Assurance	Tangibility	Empathy	Responsiveness
1	3.56	3.76	3.74	3.34	3.34
2	3.56	4.18	3.52	3.60	4.02
3	4.32	3.78	3.48	3.48	3.14
4	3.42	3.62	3.38	3.56	3.66
5	3.40	-	-	3.04	-
Average Mean	3.652	3.835	3.530	3.404	3.540
Rank	2	1	4	5	3

Table also shows the mean scores of five dimensions of Service Quality. The results revealed that the highest mean score was for Assurance (3.835) and reliability (3.652) while the lowest score was for empathy (3.404). Thus, on the parameters like employees f bank are polite and friendly, ATM's are secure to use, banks have modern equipments and upgraded technology banks are rated high.

Table 3 indicates the difference between expected and perceived level of service.

Table 3: Paired Sample T-Test

Sl. No	Statements	Mean Score (S.D) for SERVQUAL dimensions		Gap (P-E)	T-Test	P-Value
		Perception Mean(S.D)	Expectation Mean(S.D)			
	Reliability					
1	Interest in solving problems	3.5(.75639)	4.38(.66332)	-0.8	-9.193	.000
2	Perform electronic banking from the first time	3.56(1.008)	4.440(.6071)	-0.88	-6.953	.000
3	Keep records accurately	4.30(.73691)	4.720(.45126)	-0.4	-4.975	.000
4	Provide service at promised time	3.42(1.0267)	4.50(.72919)	-1.14	-8.75	.000
5	Keep promise while delivering service	3.40(.98473)	4.50(.73168)	-1.1	-9.49	.000
	Assurance					
1	Feel safe in electronic transaction	3.76(.79290)	4.520(.78470)	-0.76	-8.143	.000
2	Polite and friendly employees	4.180(4.411)	4.50(.73168)	-0.32	-0.733	0.465
3	ATM's are secure to use	3.780(.83581)	4.620(.66332)	-0.84	-7.847	.000
4	Employees behavior build confidence in customer	3.620(.85019)	4.500(.61134)	-0.88	-8.82	.000
	Tangibility					
1	Modern equipment and upgraded technology	3.740(.96001)	4.56(.60836)	-0.82	-8.21	.000
2	Modern décor	3.520(.96901)	4.380(.66332)	-0.86	-7.562	.000
3	Neat appearance	3.480(1.029)	4.400(.63564)	-0.92	-7.987	.000
4	Visually appealing material associated with service	3.380(.85019)	4.260(.74698)	-0.88	-9.004	.000
	Empathy					
1	Bank understand specific need	3.340(1.093)	4.480(.64322)	-1.14	-9.585	.000
2	Provide guidelines for e-transactions	3.600(.96400)	4.500(.57735)	-0.9	-8.739	.000
3	Convenient operating hours	3.480(1.049)	4.500(.54123)	-1.02	-8.769	.000
4	Provide information to the customers	3.560(.87985)	5.500(7.13577)	-1.94	-2.723	0.008
5	Individual attention to each customers	3.040(.94195)	4.340(.74155)	-1.3	-11.57	.000
	Responsiveness					
1	Willing to help customers	3.340(.91254)	4.540(.61002)	-1.2	-10.55	.000
2	Charge reasonably for providing e-service	4.020(5.676)	4.180(.97835)	-1.6	-0.286	0.775
3	Satisfy complaints immediately	3.140(.98494)	4.580(.60603)	-1.44	-14.58	.000
4	Tell exactly when service will be performed	3.66(.86713)	4.600(.56854)	-0.94	-10.11	.000

The highest gap between the perceived and expected service quality lies in item 17: bank provides information to the customer (1.940),item 21: your bank satisfy the complaints immediately (1.440), item 14: your bank understand your specific need (1.140), item 18: your bank give individual attention to each customer (1.300), item 4: your bank provide service at promised time (1.140) and item 5: your bank staff keep the promise while delivering services

(1.100), where as the lowest gap occur between item 20: your bank charge reasonably for providing e-service(0.160), item 7: employees of your bank are polite and friendly(0.480) and item 3: your bank keeps record accurately(0.400) . For those items P-value is less than 0.05 (p<0.05) null hypothesis is rejected and table shows that there is a significant difference between the expected and perceived level of e-service for the dimensions- reliability, assurance and tangibility. For the items: employees of bank are polite and friendly and bank charges reasonably for providing e-service the value of p is 0.465, 0.775 respectively is greater than 0.05, this shows null hypothesis is accepted for such items and there is no significant difference between expected and perceived level of e-service for the dimensions empathy and responsiveness.

Table 4 indicates the difference between public and private bank. Equal variance is assumed for all the items except item 13: materials associated with service are visually appealing (0.004) for which equal variance is not assumed. T-test indicates whether two population means are equal or not. As table shows the p-value for item: bank keep record accurately and behavior of employees build confidence in customers is 0.029 and 0.009 respectively which is less than 0.05, hence null hypothesis is rejected for these two items and a significant difference is found in reliability and assurance dimensions in the quality of public and private bank e-services for the above mentioned items. For other items the p-value is approximately similar for both public and private banks, therefore there is no significant difference in tangibility, empathy and responsiveness dimensions in the quality of public and private bank e-services.

Table 4: Mean Score: Public Banks v/s Private Banks & Independent sample test

Sr.No	Statements	Mean Public bank	Private bank	T-Test	P-Value
1	Interest in solving problems	3.54	3.58	-0.263	0.793
2	Perform electronic banking from the first time	3.74	3.38	1.806	0.074
3	Keep records accurately	4.48	4.16	2.214	0.029
4	Provide service at promised time	3.52	3.32	0.974	0.333
5	Keep promise while delivering service	3.42	3.38	0.202	0.84
6	Feel safe in electronic transaction	3.76	3.76	0	1
7	Polite and friendly employees	3.56	4.8	-1.412	0.161
8	ATM's are secure to use	3.84	3.68	1.199	0.233
9	employees behavior build confidence in customer	3.88	3.4	2.666	0.009
10	Modern equipment and upgraded technology	3.88	3.6	1.467	0.146
11	Modern décor	3.62	3.42	1.032	0.304
12	Neat appearance	3.54	3.42	0.581	0.563
13	Visually appearing material associated with service	3.3	3.46	-0.94	0.349
14	Bank understand specific need	3.38	3.3	0.364	0.717
15	Provide guidelines for e-transactions	3.78	3.42	1.891	0.062
16	Convenient operating hours	3.44	3.52	-0.38	0.705
17	Provide information to the customers	3.68	3.44	1.37	0.174
18	Individual attention to each customers	3.1	2.98	0.635	0.527
19	Willing to help customers	3.48	3.2	1.545	0.126
20	Charge reasonably for providing e-service	3.32	4.72	-1.236	0.219
21	Satisfy complaints immediately	3.22	3.06	0.811	0.419
22	Tell exactly when service will be performed	3.64	3.68	-0.23	0.819

Conclusion and Recommendations

The study examined the perception of customers towards e-service provided by banks with the help of SERVQUAL format. The SERVQUAL have not reported good score for item 18, item 20 and item 21. Dimension wise it was found that the dimensions of service quality were not equally perceived by the customers. As per ranking, Assurance is perceived highest followed by Reliability, Responsiveness, Tangibility and Empathy. No significance difference was found in the quality of public and private bank services except that the employees of private banks are more polite and friendly than public banks, which indicates that private banks are better at Assurance. In present competitive environment where customer satisfaction has become important to retain and enhance market share and earn more profit, for banks there is a need to take utmost care of dimensions like responsiveness and empathy while delivering e-services.

Suggestions:

- A strong infrastructure of providing executive/professional training including knowledge, capabilities and attitudes is required to encourage employees to become more accountable, so that they can exactly identify customers' needs and gain work satisfaction by providing coordinated services.
- Moreover, banks should pay particular attention to customer needs, for which an interchange of information is essential to understand changing customer needs and behaviors so that corporations can customize their products according to the need of customers.
- Banks have to protect customer privacy and avoid revealing any data to marketers. In order to retain the existing customers and to improve service quality, the bank should continuously maintain error-free and secure transactions, since bank accounts and figures are very sensitive for each and every customer.
- In order satisfy the customer's expectation individual attention should be given to customers so that banks can better understand their needs of customers and better satisfy them.
- Regular research activities should be conducted in order to keep track on customers' satisfaction and their expectations about various service aspects.

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Portfolio Optimization by Min-max way

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Abstract
Aim of the portfolio optimization is to achieve asset mix which offers highest expected return at a given level of risk. For that, selection of right securities, their right proportion with each other with respect to their correlations plays major role to achieve certain return and/or reduce risk. In practice, investors have multiple objectives and with all these added complexities; portfolio optimization further becomes valuable tool in the asset allocation decisions. Research in the area of portfolio optimization in general suggests that well diversified portfolio helps to achieve reasonably better return and/or reduce risk. The paper finds that there is no need of extensive diversification to achieve optimum portfolio.
Keyword: Portfolio optimization, optimization, diversification.

JEL Classification: E40, G11

Introduction

A portfolio is defined as bunch of securities held by investor. Portfolio selection process usually involves steps of observing and selecting right security based upon its expected future performance; and construction of the portfolio. (*Markowitz, 1952*). In a broad term and as per the CAPM model, Market portfolio consists of all available securities of the universe. However, most of the earlier researches in this subject are addressing construction and portfolio performance from financial assets point of view only. The present paper has also considered the same. It is a well proven fact that financial assets or securities (here equity shares) comes with high return and unwanted bundle of high risk compared to fixed return generating assets such as bank fixed deposits, postal deposits, treasury bills, National Savings Certificates (NSCs) etc. Equity stocks either hold individually or with combination with other stocks in the form of portfolio may too bring very high return or high return or may perform worse than the risk free or fixed return generating assets. Markowitz (1952) pioneered the concept of portfolio theory and it was further addressed and refined by Sharpe et al (1976). Markowitz (1991) further developed the concept of diversification and proved that right mixture of securities with the right proportion can in fact reduce portfolio risk notably.

Portfolios differ in their blend of different assets and to a large extent are accomplished to reduce unique risk of the security though a judicious combination of a negatively related security in a portfolio. Generally, portfolios have a composition of "less risk less return" securities as well as "high risk high return" securities. An empirical work carried out by Markowitz (1987, 1991) and Markowitz et al (1991) proved that it is possible to construct the portfolio with maximum return and minimum risk.

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However, the important question to address is diversification can be made to what extent i.e. how many securities should be added to construct the portfolio to reduce risk and to what proportion? It is because unlike portfolio managers or mutual fund companies, individuals have time, skill and investment constraint to diversify with maximum possible extent and to reshuffle the portfolio continually. Moreover, hypothetically for a portfolio with n assets or with large number of stocks, the portfolio variance is the weighted sum of average variance and the average covariance of securities. Finally as the number of securities increases, the variance of securities diminishes, and portfolio variance equals to the average covariance. (*Pandey, 2005*).

Portfolio risk (standard deviation) is equal to the sum of the variances and covariance of securities with each other.

Portfolio Variance $= \sigma^2_p = n[\ 1/n^2] \times$ average variance $+ n(n-1)\ [1/n^2] \times$ average covariance (1)

$\qquad\qquad\qquad = [1/n] \times$ average variance $+ [1-1/n] \times$ average covariance $\qquad$ (2)

In a well diversified portfolio, when the number of scrips increases in a portfolio, variances of individual securities becomes quite negligible, but the covariance of securities with each other always carries some influence.

Thus,

Portfolio Variance $= \sigma^2_p =$ average covariance

Thus, when the number of scrips increases in a portfolio, variance of the portfolios becomes equal to only average covariance. This shows the characteristics of risk diversification as the number of scrips rises in a portfolio. One thing must be noted that effectiveness of diversification relies upon the securities considered from varied sectors and correlation of the securities considered for the portfolio formation. If possible, highly negative or at least poorly correlated securities help to reduce portfolio risk. Further, when total risk is decomposed in to systematic and unsystematic risk, unsystematic risk can be eliminated or at least reduced as more and more securities are added to the portfolio. Therefore, the question is an investor should hold how many securities to eliminate unsystematic risk. Study in the USA says that holding about 15 shares can eliminate unsystematic risk. (*Evans and Archers, 1968*). As the financial markets of different economies vary in terms of their efficiency as per Efficient Market Hypothesis (EMH) in Indian market; portfolio constructed of around 40 shares can eliminate unsystematic risk. *(Gupta, 1981).*

The present paper attempts to select right mixture of securities as per their correlation with each other and that too in a right proportion to gain higher return for given level of risk or vice a versa by keeping in mind risk averse investor.

Review of Literature

Block (1969) said that elements in the academic portfolio theories are return, risk and covariance mainly; while in the real world, the elements are return, a broader concept of risk, time horizon, volatility, sub-strategies, imperfect market and an economic framework that is made up of succession of specific events. Researcher noted that when large differences exist between concepts and omission of basic elements; professional portfolio manager is inclined to ignore these valuable contributions from the theory. Most of the literature in the area of portfolio construction exclusively focuses on common stocks and risk free securities and other investment media such as bonds, commodities and real estate are not included in the covariances with other securities. In this track by using the multimedia diversification Robichek et al (1972) confirmed the improved efficient curve and supported the argument that consideration of other investment

avenues rather than just focusing on traditional options of equities and risk free securities is desirable. Pye (1974) found absence of diversification and noted that none of the assumption like independence or negative correlation between the securities or returns was stochastic and under such circumstances such an investor will buy some of a security with a stochastic return enough though it offers no higher expected return than a risk less security. Further, author observed that usually investors/portfolio managers end up with much more volatile security even if its return is highly positively correlated with another security with positive mean return. Perold (1984) showed how parametric algorithm for large-scale portfolio optimization can be made efficient by "sparsifying" the covariance matrix with the introduction of few additional variables and constraints and treated transaction cost schedule as nonlinear non-differentiated function. By incorporating restricted buy and sell transactions, it resulted in to good optimal solution.

Konno and Yamazaki (1991)[3] worked with the objective of portfolio optimization model by applying mean absolute deviation function can reduce most of the problems associated with Markowitz Model by keeping intact its advantage over equilibrium model. The model proposed by the authors rely on the linear program instead of quadratic program and when it was applied to 225 stock of NIKKEI for the portfolio construction, it gave almost similar result with that of Markowitz Model. Feinstein and Thapa (1993) have reworked on the path proposed by Konno and Yamazaki (1991) who gave the assumption in their model that there is no upper limit for investment and the number of non zero assets in a portfolio is $2T^4+2$. The formulation presented by Feinstein and Thapa indicates that it has a bound of T+2 of non zero assets in the optimal portfolio. Young (1998)[5] has given a framework to construct the optimal portfolio from the historical data based on minimum return rather than variance as a measure of risk and the resultant portfolio are very close to those chosen by a mean-variance rule. Cai et al (2000) attempted to construct an optimal portfolio for minimax rule with a novel approach of minimizing maximum individual risk and without using covariance data. With one step ahead of the earlier frame work; Cai et al (2004) numerically compared the performance of the proposed model with that of Markowitz's quadratic programming model. The result indicated that the result is similar to the Markowitz model and the proposed model is not sensitive to data.

Leibowitz and Roy (1988) found that portfolio optimization could also be applied to the asset allocation decision when investor has both assets and liabilities and liabilities can be treated as a short position within the overall portfolio. It summarizes that return and risk are then measured in terms of changes in the surplus of the asset value over the liability value. Jorion (1992) said that with more diversified assets, better is the performance and when assets are diversified internationally, portfolio return improves. It is common practice observed in the investment world is that of imposing a constraint of tracking error to control the risk of the active portfolios. Jorion (2003) reviewed that with such a constraint, portfolio managers do not pay proper attention to total portfolio risk and results in to inefficient portfolios. Similar to Perold (1984); Muralidhar (2000) said that just considerations for standard deviations for portfolio construction is not enough, investors must consider for correlations as different correlations imply different relative risks or insufficient return for such risks. Author provided new solution named M3 measure which is more comprehensive in nature and takes in to considerations standard deviations, correlations, risk free asset and risky mutual funds.

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[3] Considered for analysis
[4] T is the number of time periods in the data base used to approximate the parameters of the return distributions of the assets.
[5] Considered

Krasker (1981) have examined some of the implications of certain forms of minimax behavior in portfolio selection. Author said that decision makers propose minimax approach over probability distribution as usually later is subjective and often based on vague information and found that portfolios constructed on the minimax approach results in to reasonable one. Similar to Krasker (1981) but by different approach; Tam et al (1991) have derived screening rules by applying a rule induction method and constructed and evaluated portfolio by applying Sharpe, Treynor and Jenson method. Result received by the method concluded that regularities among stocks can be identified and portfolios so constructed outperformed the NYSE and S&P 500 index for the same period. A seminal work done by Dani et al (2012) has worked on the path paved by Krasker (1981) and constructed the number of portfolios of different sizes in order to find out the performance of the portfolio constructed using the Min-Max approach. The return of the portfolio constructed using min-max approach was compared with market, equal allocation portfolios and best performing mutual funds. Portfolio constructed through minimax approach outperformed the market and other portfolios in terms of return, volatility, Sharpe ratio, alpha and beta. This confirms with the finding of Krasker (1981).

Data and Methodology

Rationale for the study
Today various options are available to the investor for the investment and many of them have been giving high return on the investment. Nevertheless, with high return, it also carries high risk. If funds of the investors are not properly managed, it may lead to loss rather than giving return on investment. Due to high fluctuation in the stock market, it is essential for the investors to invest into diversified securities rather than investing into one or two securities. This study is conducted to know how an investor can minimize his risk and can earn maximum return from the portfolio. To identify the mechanism by which an investor can hedge the risk.

Research objectives
The present study aims to construct the optimum portfolio with higher return and minimum risk and to check whether such securities possess negative or poorly positive correlation with each other.

By keeping in mind market portfolio as the most efficient one; it studies by how many securities the constructed portfolio can outperform the market portfolio.

A portfolio is defined as collection of assets of real and financial type. In this paper, construction of the portfolio is based on financial assets of Nifty 50 stocks only. An investment in fixed guaranteed assets can fetch an assured return with zero risk at least in nominal terms while an investment in a security does not give guaranteed or assured return and it changes depending upon different factors. It may sometime provide high or very high or less return than risk free security. The sample considered for the study is 50 stocks of Nifty 50. To compare the performance of the derived portfolio, market index as well as top 10 mutual funds were considered for the study. For that security prices are collected for a period of 1st April, 2003 to 31st March, 2013. Further, in the present study transaction costs is not considered. Portfolios return and risk were computed as per the Markowitz Modern Portfolio Theory. When return, risk and correlation were computed for all 50 stocks, it was found that Bharti Airtel and Coal India have negative correlation with many securities of the nifty 50, however the average return provided by both these securities were low and their risks was high, so both of them were not considered for the portfolio formation. Stock named DLF provided very minute negative return, but its risk was exorbitantly high, so, it was dropped. For a similar reason NMDC Ltd was also

not considered for the portfolio construction. Thus, the analysis focuses on the portfolio formation based on remaining 46 securities. The computation of the portfolio by combination of different securities and in a varied proportion is considered by keeping in mind risk averse investors.

For the present analysis, 46 stocks of nifty 50 are considered for the construction of the portfolio. Appendix 1 shows the risk and return of all 50 stocks. These risk and return are calculated on the basis of prices of all the scrips during 1st April, 2003 to 31st March, 2013. Table 1 shows that scrips like Sesa goa, IndusInd Bank, Lupin Limited, Hindalco, Mahindra & Mahindra, Bajaj Auto, HCL Technology, NIIT Tech. etc have given more than 40% return during this period, but also comes with high risk. Compared to other securities, risk of Power Grid, HUL, NTPC, TCS, Ambuja, Cairn India, Maruti Suzuki and BPCL is less, but also provided less return, and many more have provided even less return than risk free securities. Beta is a measurement of systematic risk and systematic risk cannot be avoided by diversifying portfolios. Beta of the security greater (lesser) than one indicates the given security has a higher (lower) risk than market and considered of an aggressive (conservative) category. Value of beta near to one indicates security move parallel to market, while security with negative beta value indicates inverse relation with the market and such stocks are good during the downfall of the market. For the composition of the different portfolios, one criterion along with risk and return considered was selection of the stocks as per their beta values. The portfolios were evaluated based on the Risk, Return, Beta and Sharpe Ratio. Sharpe Ratio is also one of the measures to judge the performance of the portfolio. It refers to the return generated by the portfolio compared to risk free security divided by the risk of the portfolio. Higher the Sharpe ratio, the better the portfolio is.

To create an efficient portfolio, various factors are considered like Risk & Return of scrips, Beta, Correlation/Covariance, Sharpe Ratio etc. On the basis of such factors, 75 different portfolios are created. Risk and return of these portfolios are shown in Appendix Table 2. Some of the best portfolios on the basis of risk and return are shown in Appendix Table 1 & 2.

Experimental Results

In order to find out the performance of the portfolio constructed using the Min-Max approach, a number of different portfolios of different sizes were constructed. These portfolios were constructed based on the share prices for the period 1 April 2003 to 31 March 2013. Table 1 and 2 shows portfolio constructed of different number of securities, their return, risk and Sharpe ratio.

Out of 75 portfolios created, portfolio of 9 scrips[6] has given good return with comparatively low risk. The investor, who does not want to bear much risk, can invest in the portfolio of these 9 scrips which gives return near to 24 percent which is very near to market return i.e. 24.63 percent. However, the good part is that such portfolio of nine securities also comes with low risk compared to market risk that is 38.31 percent. In addition, Sharpe ratio is far better of these portfolios compared to market (see table 2 of appendix).

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[6] Portfolios given in table 1. Further, this portfolio of nine securities are constructed by taking different proportions.

Table 1: Top 10 Portfolios With Low Risk				
Portfolio	Number of Scrips	Risk (%)	Return (%)	Sharpe Ratio
1	9	19.9484	24.2102	0.7652
2	9	20.1928	24.4404	0.7674
3	9	20.4668	24.5179	0.7609
4	9	20.6447	24.1828	0.7381
5	9	20.7191	24.1702	0.7348
6	9	20.9366	24.2603	0.7315
7	9	21.1962	24.1242	0.7161
8	9	21.4970	24.9513	0.7446
9	9	21.8053	24.5197	0.7142
10	9	21.8437	25.1003	0.7396

Table 2: Top 10 Portfolios With High Return				
Portfolio	Number of Scrips	Risk (%)	Return (%)	Sharpe Ratio
1	46	64.8204	30.4123	0.3312
2	46	61.7491	29.9242	0.3397
3	46	63.5091	29.5013	0.3237
4	46	61.8897	29.1969	0.3272
5	46	61.5001	29.0749	0.3273
6	9	33.1659	29.0133	0.6051
7	9	33.7359	28.9100	0.5918
8	46	63.6103	28.8297	0.3126
9	9	32.0667	28.8168	0.6197
10	46	59.5867	28.4067	0.3266

This helps an investor to earn the same return with lower risk. Table 2 shows the top 10 scrips with high return. Such portfolios have given high return than market and on the other hand risk of these portfolios is very high than market. Finally, portfolio was constructed based upon min-max approach by adjusting their weights by number of trials and errors. Securities considered for this portfolio are namely ACC, Asian Paints, HDFC, HDFC Bank. HUL, SBI, Sun Pharma, Ultra Tech and Cairn India.

Table 3: List of the Scrips selected on the basis of Min-Max Approach			
Scrips	Weight (%)	Return (%)	Risk (%)
ACC	18.00	30.95809	46.70941
Asian Paints	17.00	38.8157	51.47679
HDFC	1.00	25.58269	56.05499
HDFC Bank	1.00	24.83746	48.77395
Hindustan Unilever Ltd.	53.00	15.99095	17.7436
SBI	7.00	31.60055	51.75228
Sun Pharma	0.50	28.52213	60.39909
UltraTech Cement	2.00	30.50353	48.94949
Cairn India	0.50	18.98711	41.37538
Portfolio	**100.00**	**24.2102**	**19.9484**

The comparison of returns obtained by the proposed Min-Max approach and those obtained by other approaches like equal allocation, Nifty index, and 10 best performing mutual funds in the country can be observed in Table 4 and in Table 5. The 10 best performing mutual funds are selected based on their NAV values.

Table 4: Performance of different portfolios (1st April, 2003 to 31st March, 2013)					
	Return (%)	**Risk (%)**	Sharpe Ratio	Beta	Alpha
Min-Max Approach	24.2102	19.9484	0.7652	0.2739	17.4637
Equal Allocation	27.7879	60.743	0.3102	1.3996	-6.6807
NSE Index	24.6281	38.3124	0.4093	1	

It can be easily seen from these tables that the returns obtained by Min-Max approach is lesser than equal allocation and index; but at the same time risk of the min-max approach is substantially less than equal allocation and NSE index. However, portfolio formed through min-max provides better return than the returns of the 10 best performing mutual funds for the period 2003-2013. The Sharpe ratio of the portfolio constructed through min-max is substantially higher than that of equal allocated and NSE index. The other notable advantage is that portfolio constructed by min-max approach has substantially lower beta compared to market and portfolio constructed through equal allocation. It shows that portfolio constructed through min-max approach is risky and aggressive.

Table 5: Performance of top 10 mutual funds of India (From 1st April, 2003 to 31st March, 2013)			
Sr. No.	Mutual Fund	Return (%)	Risk (%)
1	Dws Alpha Equity Fund	20.2509	36.8446
2	HSBC India Opportunities Fund	17.6301	36.2730
3	Canara Reobeco Balance	26.6816	34.7736
4	JM Balanced Fund	10.4778	34.6929
5	LIC Normura Balance Fund	17.5100	32.0618
6	ICICI Prudential Balanced	23.6050	31.4816
7	FT India Balanced Fund	23.3463	31.2819
8	HDFC Balanced Fund	23.5494	31.2043
9	Birla Sun Life Aggressive Plan- Growth	15.9787	30.8921
10	Baroda Pioneer Balance Fund- Growth	13.4290	30.1147

Here, total 77 best performing mutual funds were studied in terms of their risk and return and their return and risk was computed for a period of 2003 to 2013. Table 4 of the appendix presents list of the 67 top performing mutual funds. It is well known fact that mutual funds are well-diversified portfolio managed by professionals and many times they have outperformed the market. Here by comparing table 4 and table 5 and further table 4 with appendix table 4, it is realized that portfolio

constructed through min-max approach has provided far better return-risk result than that of professionally managed mutual funds.

Figure 1: Efficient Frontier of Portfolio (Nifty 50, Mutual Fund and Portfolio constructed through min-max approach and other equity portfolios)
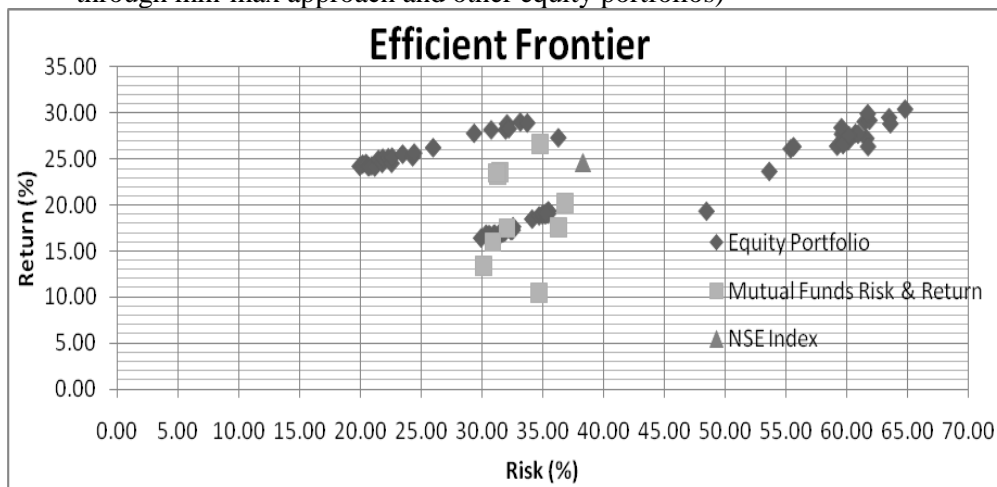
When securities are added to a portfolio, the expected return and standard deviation changes in a very specific manner. The variance of the portfolio depends on how these securities correlate with each other and vary with respect to the other securities, which are present in the portfolio. From the available data on expected returns, variances and covariance, minimum variance portfolio can be computed and thus constructed, for any targeted return. In figure, X-axis represents standard deviation (risk) of the portfolio; while Y-axis represents expected return of the portfolio. It is to be noted that dots show the risk and return of the various portfolios (Nifty 50, Mutual Fund and Portfolios constructed through min-max approach and other equity portfolios). It is further observed that portfolios constructed through equities (i.e. other than index and mutual funds) are lying toward the north-east, centre as well as north-west compared to mutual fund and index. This shows that portfolios constructed from the given equity shares can give outcome ranging from higher return with comparatively low risk to lower return with higher risk. To have a portfolio with its risk-return lying on the north-west requires right picking up of the securities and the proportion of each security in a portfolio. All the portfolios that lie on the upper left side (north-western region), and not on the lower right side (south-eastern region), are optimal portfolios. The north-western regions, where the optimal portfolios reside are called the efficient frontier. Thus, optimal portfolios are effectively the efficient portfolios. Hence, the name, efficient frontier, is accorded to the region where these portfolios reside. The investor chooses the portfolios from these efficient portfolios and this is the essence of modern portfolio theory. The portfolios or securities lying on the lower side are with higher standard deviation and lower return; hence these portfolios are inefficient. The portfolios (or securities) lying on the right hand side have higher risk for a given level of return. Hence, this frontier is inefficient as well.

Conclusion & Finding

Portfolio optimization is a procedure of measuring and controlling portfolio risk and return. And thus, portfolio optimization is basically diversification---reducing portfolio risk by combining assets whose specific risks offsets each other. Therefore, the optimization technique takes in to account correlation with each other. That is the reason by combining such stocks can offer highest level of return for given level of risk. From the above analysis, it was found that by mere increasing number of securities in a portfolio, neither helps to increase return nor to reduce risk. After eight to nine number of securities included in a portfolio; when number of securities are added in portfolio till 46; return increases marginally, but compared to it risk rises substantially. Portfolio constructed through min-max approach has nine securities[7] and only HUL has negative correlation with Asian Paints, Cairn India, HDFC Bank, Sun Pharma, SBI and Ultra Tech; while remaining all securities have positive correlation with each other. Moreover, it can be noted from the correlation matrix (shown in the exhibit table 3) that remaining securities of the min-max have significant positive correlation with each other and not poorly positive correlation. Thus, the min-max portfolio which provides highest return for a given level of risk possess mixed band of negative and above average positive correlation with each other. Further, due to this reason proportion of HUL is maintained highest in the portfolio while the fact is that HUL's return is only 15.99% for a risk of 17.34% which is the lowest risk-return among nine securities considered for the min-max portfolio. Here, the market portfolio i.e. Nifty 50 considered as a benchmark portfolio and provides return of 24.63% for a risk of 38.31% for a period of 1st April, 2003 to 31st March, 2013. In addition, it was noted that it is not required to have 'n' number of securities to reduce risk of the portfolio. Rather than 'n' number of securities, what requires is the judicious selection of securities and in a right proportion. Thus, the portfolio constructed of mere 9 securities can outperform the market portfolio as well as professionally managed mutual funds.

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[7] See Table 3

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Appendix

Table 1: Return & Risk of Securities of Nifty 50 (From 1st April, 2003 to 31st March, 2013)

Scrip	Return (%)	Risk (%)	Beta	Scrip	Return (%)	Risk (%)	Beta
ACC Ltd.	30.9581	46.7094	1.052987	IndusInd Bank	72.9287	140.1178	2.36532
Ambuja	13.2448	40.3499	0.901527	Jaiprakash Associates	5.4721	71.1364	1.497293
Ashok Leyland	23.3055	97.1641	2.194242	JSPL	11.5784	53.8187	0.521808
Asian Paints	38.8157	51.4768	0.76763	Kotak Mahindra Bank	20.8554	68.6067	0.850216
Axis Bank	30.6433	91.4808	2.146942	Larsen & Toubro	31.6432	84.6495	1.953433
Bajaj Auto	54.9487	114.6729	2.513411	Lupin Ltd.	56.0828	136.1047	2.257601
Bank of Baroda	38.2604	79.1239	1.579732	Mahindra & Mahindra	45.7035	112.9637	1.840511
BHEL	28.0264	88.3891	1.933057	Maruti Suzuki	17.2524	44.4819	0.819334
BPCL	13.0131	45.5310	0.783232	NIIT Tech	41.9176	95.3597	1.429973
Bharti Airtel	-11.5729	23.6962	-0.10298	NMDC Ltd.	-14.5444	68.2680	2.120414
Cairn India	18.9871	41.3754	0.67805	NTPC Ltd.	8.9782	25.7621	0.443595
Cipla	13.6527	66.5686	1.086882	ONGC	12.5051	56.2055	1.103855
Coal India	-5.8409	5.8380	0.153826	Power Grid	1.4899	6.4694	0.098084
DLF	-2.3389	59.0477	1.661072	PNB	37.4435	83.2826	1.702518
Dr. Reddy's Lab	18.9761	63.7798	1.066576	Ranbaxy Laboratories	12.8461	71.6180	1.065952
GAIL	28.5562	67.3324	1.485465	RIL	18.7880	46.2201	0.578272
Grasim Industries	36.9753	72.4653	1.577445	Sesa Goa	108.0890	231.0971	4.848569
HCL Technologies	41.2242	89.7767	1.697178	SBI	31.6005	51.7523	1.224637
HDFC Bank	24.8375	48.7740	1.01289	Sun Pharma	28.5221	60.3991	1.096927
Hindalco Industries	26.7035	132.6550	3.239023	TCS	7.8034	38.5923	0.540281
Hindustan Unilever Ltd.	15.9909	17.7436	-0.34498	Tata Motors Ltd.	35.6693	127.8056	2.467927
HDFC	25.5827	56.0550	1.222317	Tata Power	35.4168	93.8363	1.899387
I T C Ltd.	8.5620	45.8736	0.140761	Tata Steel	17.5990	94.5479	1.932212
ICICI Bank	38.1944	70.0321	1.598364	Ultra Tech Cement	30.5035	48.9495	0.98936
IDFC	33.2275	85.7584	1.637128	Wipro	2.6543	69.5586	1.027904

Table 2: portfolio constructed of Nifty 50 with different proportion						
Portfolio	**Number of Scrips**	**Risk (%)**	**Return (%)**	**Sharpe Ratio**	**Beta**	**Alpha**
Nifty Index		38.3124	24.6281	0.4093	1.0000	0.0000
1	46	60.7430	27.7879	0.3102	1.3996	-6.6807
2	46	61.5001	29.0749	0.3273	1.3912	-5.1876
3	46	60.1288	26.9649	0.2997	1.3784	-6.9825
4	46	59.2297	26.3981	0.2947	1.3670	-7.2679
5	46	59.6322	27.7069	0.3146	1.3815	-6.3176
6	46	61.8897	29.1969	0.3272	1.4143	-5.6355
7	46	55.4065	26.1011	0.3096	1.2984	-5.8768
8	46	55.6376	26.3407	0.3127	1.3072	-5.8534
9	46	64.8204	30.4123	0.3312	1.4999	-6.5284
10	46	61.6370	27.2389	0.2968	1.4236	-7.8215
11	46	59.7120	26.5776	0.2953	1.3600	-6.9171
12	46	63.5091	29.5013	0.3237	1.4639	-6.5510
13	46	61.7732	26.3486	0.2817	1.4142	-8.4800
14	46	63.6103	28.8297	0.3126	1.4687	-7.3425
15	46	60.9523	27.7004	0.3077	1.3971	-6.7084
16	46	59.5867	28.4067	0.3266	1.3683	-5.2913
17	46	61.7491	29.9242	0.3397	1.4249	-5.1679
18	46	60.2153	27.5224	0.3085	1.3942	-6.8145
19	46	53.6481	23.6488	0.2741	1.2778	-7.8204
20	39	34.1384	18.4693	0.2790	0.8142	-1.5817
21	39	32.5640	17.6386	0.2670	0.7836	-1.6609
22	39	31.4861	16.7634	0.2483	0.7436	-1.5507
23	39	32.3797	17.2266	0.2558	0.7704	-1.7481
24	39	31.7362	16.9649	0.2527	0.7580	-1.7040
25	39	31.9049	17.1014	0.2556	0.7621	-1.6665
26	39	31.7115	17.3436	0.2648	0.7566	-1.2908
27	39	32.4665	17.3893	0.2601	0.7758	-1.7184
28	39	32.0635	17.4613	0.2656	0.7651	-1.3819
29	39	31.0584	16.8391	0.2542	0.7445	-1.4968
30	39	31.7323	17.1723	0.2593	0.7576	-1.4853
31	39	31.0056	16.6773	0.2494	0.7429	-1.6183
32	39	30.9748	16.8051	0.2537	0.7363	-1.3291
33	39	30.4990	16.7184	0.2549	0.7278	-1.2056
34	39	30.5680	16.7412	0.2550	0.7275	-1.1765
35	39	30.6493	16.7387	0.2543	0.7322	-1.2949
36	39	30.3459	16.8260	0.2597	0.7050	-0.5371
37	39	31.0110	16.4954	0.2435	0.7081	-0.9438
38	39	32.5269	17.2688	0.2559	0.7819	-1.9891
39	39	29.9308	16.4124	0.2495	0.7131	-1.1500
40	39	35.1852	18.9982	0.2857	0.8313	-1.4755
41	39	48.4809	19.3248	0.2141	0.8600	-1.8555
42	39	35.4611	19.3016	0.2920	0.8509	-1.6550
43	39	35.4367	19.0113	0.2841	0.8534	-2.0074

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44	39	35.4653	19.3653	0.2938	0.8514	-1.6025
45	39	35.2231	18.9785	0.2848	0.8499	-1.9532
46	39	34.7091	18.8157	0.2844	0.8300	-1.6245
47	39	34.9976	18.9011	0.2845	0.8446	-1.9007
48	39	35.0198	18.9794	0.2865	0.8422	-1.7627
49	39	35.2711	18.9855	0.2847	0.8520	-1.9979
50	39	35.2493	19.1245	0.2888	0.8464	-1.7218
51	9	19.9484	24.2102	0.7652	0.2739	17.4637
52	9	20.1928	24.4404	0.7674	0.2799	17.5466
53	9	20.4668	24.5179	0.7609	0.2985	17.1673
54	9	20.6447	24.1828	0.7381	0.2838	17.1940
55	9	20.7191	24.1702	0.7348	0.3090	16.5590
56	9	20.9366	24.2603	0.7315	0.3023	16.8147
57	9	21.1962	24.1242	0.7161	0.3059	16.5916
58	9	21.4970	24.9513	0.7446	0.3712	15.8100
59	9	21.8053	24.5197	0.7142	0.3277	16.4484
60	9	21.8437	25.1003	0.7396	0.3289	16.9998
61	9	22.2960	25.1379	0.7263	0.3449	16.6434
62	9	22.5722	24.5274	0.6903	0.3753	15.2840
63	9	22.6085	25.2041	0.7191	0.3931	15.5224
64	9	23.4804	25.5253	0.7061	0.4387	14.7206
65	9	24.3118	25.2390	0.6702	0.4540	14.0581
66	9	24.4307	25.6485	0.6837	0.3964	15.8867
67	9	25.9897	26.2277	0.6650	0.5236	13.3328
68	9	29.3638	27.7977	0.6420	0.5517	14.2102
69	9	30.7705	28.1698	0.6248	0.5898	13.6437
70	9	31.9502	28.1645	0.6015	0.6844	11.3102
71	9	32.0667	28.8168	0.6197	0.6606	12.5466
72	9	32.2126	28.2939	0.6006	0.6893	11.3165
73	9	33.1659	29.0133	0.6051	0.7182	11.3249
74	9	33.7359	28.9100	0.5918	0.7564	10.2810
75	9	36.2921	27.3109	0.5060	0.8555	6.2407

Table 3: Corrélation Matrix

	ACC Ltd.	Ambuja	Ashok Leyland	Asian Paints	Axis Bank	Bajaj Auto	BOB	BHEL	BPCL	Bharti Airt	Cairn India	Cipla	Coal India	DLF	Dr. Reddy's	GAIL
ACC Ltd.	1.0000	0.9574	0.6659	0.4138	0.8526	0.8593	0.5111	0.8516	0.5987	-0.3385	0.7144	0.6852	1.0000	0.8039	0.6146	0.6907
Ambuja		1.0000	0.8357	0.9075	0.8909	0.8853	0.8636	0.5888	0.6811	-0.2761	0.9055	0.6239	1.0000	0.8933	0.8842	0.9501
Ashok Leyland			1.0000	0.5320	0.9843	0.9420	0.8906	0.6985	0.7257	-0.6642	0.6623	0.6667	-1.0000	0.8675	0.7536	0.7745
Asian Paints				1.0000	0.9650	0.9814	0.4190	0.1703	0.0472	-0.5079	0.7029	0.3464	-1.0000	0.9868	0.8069	0.1848
Axis Bank					1.0000	0.9447	0.9660	0.8570	0.5803	-0.6227	0.9443	0.8819	-1.0000	0.9405	0.9843	0.9705
Bajaj Auto						1.0000	0.8751	0.7782	0.5542	-0.9541	0.8650	0.8711	1.0000	0.9281	0.9508	0.8679
BOB							1.0000	0.5246	0.8052	-0.5142	0.7558	0.3543	-1.0000	0.8306	0.5837	0.8349
BHEL								1.0000	0.5807	-0.5313	0.6738	0.6914	-1.0000	0.7029	0.4292	0.7434
BPCL									1.0000	-0.0423	0.8201	0.4592	1.0000	0.3667	0.3318	0.9089
Bharti Airtel										1.0000	-0.0835	-0.8232	1.0000	-0.5062	-0.6915	-0.1052
Cairn India											1.0000	0.2663	1.0000	0.8111	0.4969	0.9776
Cipla												1.0000	-1.0000	0.8818	0.6764	0.4835
Coal India													1.0000	-1.0000	1.0000	-1.0000
DLF														1.0000	0.8785	0.9007
Dr. Reddy's Lab.															1.0000	0.3349
GAIL																1.0000

	Grasim In	HCL Tech.	HDFC Bank	Hindalco Ind.	HUL	HDFC	I T C Ltd.	ICICI Bank	IDFC	IndusInd B	JP Associat	JSPL	Kotak Mahi	L & T	Lupin Ltd.
ACC Ltd.	0.7300	0.5849	0.5072	0.8729	0.0944	0.7031	-0.1195	0.6457	0.8337	0.3809	0.8925	0.5828	0.1908	0.8490	0.5670
Ambuja	0.8987	0.8899	0.6668	0.8765	0.0296	0.6006	0.4458	0.8970	0.8891	0.8875	0.8861	0.2072	0.8274	0.9309	0.3407
Ashok Leyland	0.7689	0.7464	0.6659	0.9965	-0.4671	0.6794	0.1505	0.8794	0.9047	0.7620	0.7686	-0.0330	0.6770	0.8185	0.7211
Asian Paints	0.1365	0.8341	0.5709	0.9316	-0.2050	0.5294	0.1157	0.6443	0.9480	0.7654	0.6375	-0.1647	0.7872	0.8627	-0.0179
Axis Bank	0.9372	0.9880	0.8747	0.9895	-0.3854	0.7702	0.5398	0.9987	0.9929	0.9922	0.9499	-0.1946	0.9240	0.9897	0.6220
Bajaj Auto	0.9971	0.9528	0.6844	0.9469	-0.5833	0.8707	0.6440	0.9478	0.9803	0.9686	0.9996	-0.7108	0.9881	0.9616	0.9258
BOB	0.7803	0.7138	0.6844	0.9855	-0.4365	0.5427	0.4700	0.8662	0.8957	0.8557	0.3724	-0.0497	0.7400	0.6498	0.7259
BHEL	0.7797	0.4175	0.6438	0.8609	-0.7892	0.6912	-0.1852	0.6206	0.7775	0.2437	0.8562	0.5951	0.0781	0.7410	0.6764
BPCL	0.8442	0.3360	0.3451	0.6751	0.0301	0.4960	0.3203	0.5312	0.5770	0.4826	0.2811	0.1088	0.2971	0.6503	0.8015
Bharti Airtel	-0.4743	-0.6440	-0.3329	-0.6498	0.5589	-0.4906	-0.4258	-0.6114	-0.4722	-0.6027	-0.7216	0.8855	-0.6291	-0.2995	-0.9720
Cairn India	0.7653	0.4937	0.7313	0.9730	-0.2970	0.6793	0.4445	0.6119	0.8565	0.7348	0.4045	0.2778	0.6810	0.9059	0.1900
Cipla	0.5090	0.4778	0.2764	0.8391	-0.5574	0.5375	-0.2873	0.3763	0.4752	0.2199	0.7596	0.0207	0.0175	0.7106	0.5194
Coal India	1.0000	-1.0000	-1.0000	-1.0000	1.0000	-1.0000	-1.0000	-1.0000	-1.0000	-1.0000	1.0000	1.0000	-1.0000	-1.0000	1.0000
DLF	0.9551	0.9798	0.8127	0.8865	-0.2090	0.8264	0.6892	0.9565	0.9466	0.9109	0.9332	-0.1445	0.9249	0.9724	0.5381
Dr. Reddy's Lab.	0.3218	0.8868	0.4907	0.9989	-0.3598	0.4424	-0.0700	0.6873	0.7501	0.7348	0.7298	-0.1541	0.4896	0.7715	0.2947
GAIL	0.9498	0.4635	0.6263	0.9679	-0.2774	0.7097	0.3740	0.6941	0.8936	0.5361	0.5226	0.2901	0.4971	0.9500	0.8234
Grasim Ind.	1.0000	0.4760	0.5373	0.9153	-0.1137	0.7495	0.3808	0.7235	0.9655	0.4744	0.8373	0.3524	0.6063	0.9516	0.9209
HCL Tech.		1.0000	0.6709	0.9581	-0.3290	0.5548	0.2901	0.8524	0.8114	0.8726	0.6160	-0.0550	0.6363	0.7418	0.4044
HDFC Bank			1.0000	0.8384	-0.6886	0.6276	0.1747	0.8044	0.8283	0.6695	0.4940	0.2900	0.5306	0.7534	0.3453
Hindalco Ind.				1.0000	-0.3932	0.7350	0.4839	0.9816	0.9832	0.9967	0.9412	-0.1988	0.9084	0.9674	0.6484
HUL					1.0000	-0.2062	0.0546	-0.3631	-0.3247	-0.3494	-0.1684	0.5484	-0.1877	-0.2668	-0.3788
HDFC						1.0000	0.2905	0.6877	0.8345	0.5196	0.6833	0.2779	0.6120	0.8326	0.6219
I T C Ltd.							1.0000	0.3105	0.5935	0.5124	-0.4165	-0.2450	0.4862	-0.0144	0.4197
ICICI Bank								1.0000	0.9016	0.8494	0.6980	0.1598	0.8069	0.7240	0.5995
IDFC									1.0000	0.9385	0.7528	-0.0912	0.9064	0.9524	0.5329
IndusInd Bank										1.0000	0.3473	-0.2376	0.8275	0.6317	0.4055
JP Associates											1.0000	0.6040	0.3723	0.7187	0.6415
JSPL												1.0000	-0.2748	0.3543	0.1506
Kotak Mahindra Bank													1.0000	0.4773	0.4389
L & T														1.0000	0.5541
Lupin Ltd.															1.0000

	M & M	Maruti Su	NIIT Tech	NMDC Ltd.	NTPC Ltd.	ONGC	Power Gr	PNB	Ranbaxy L	RIL	Sesa Goa	SBI	Sun Pharma
ACC Ltd.	0.4955	0.8544	0.5365	0.8706	0.7279	0.6838	0.7863	0.5982	0.3024	0.3104	0.6132	0.6711	0.6143
Ambuja	0.8910	0.7831	0.9028	0.9545	0.7413	0.3831	0.6386	0.8338	0.9013	0.0295	0.8463	0.8965	0.2902
Ashok Leyland	0.6147	0.8394	0.8150	0.9105	0.4735	0.6635	0.6966	0.8450	0.6647	0.2515	0.8139	0.8468	0.6920
Asian Paints	-0.1558	0.7080	0.7143	0.9678	0.3886	0.1819	0.7532	0.2228	0.7318	-0.1884	0.2041	0.4433	0.2021
Axis Bank	0.7871	0.9336	0.9528	0.9657	0.9342	0.5957	0.6888	0.9666	0.9795	-0.0810	0.9806	0.9598	0.4509
Bajaj Auto	0.6452	0.9977	0.9886	0.9090	0.9042	0.7574	0.8605	0.9121	0.9913	-0.6170	0.9891	0.7971	0.6380
BOB	0.7067	0.5148	0.6666	0.9109	0.1849	0.6170	0.6164	0.9473	0.8071	0.2090	0.8959	0.9016	0.5126
BHEL	0.6326	0.8211	0.4148	0.7548	0.8333	0.7397	0.3586	0.6670	0.1314	0.5447	0.6837	0.7024	0.6772
BPCL	0.7853	0.5464	0.2320	0.5302	0.4658	0.6860	0.5688	0.8408	0.4273	0.4018	0.8354	0.8075	0.5906
Bharti Airtel	-0.1871	-0.7817	-0.7221	-0.4250	0.0461	-0.6264	-0.7462	-0.6118	-0.5995	0.5859	-0.6177	-0.1906	-0.6541
Cairn India	0.3362	0.5972	0.3261	0.9046	0.9173	0.4445	0.6632	0.7022	0.7226	0.5119	0.7797	0.9208	0.2215
Cipla	0.3166	0.8647	0.2699	0.8086	0.5988	0.5678	0.6299	0.3581	0.0775	0.1336	0.3607	0.4595	0.6561
Coal India	-1.0000	1.0000	1.0000	-1.0000	-1.0000	-1.0000	1.0000	-1.0000	1.0000	-1.0000	-1.0000	-1.0000	-1.0000
DLF	0.8969	0.8350	0.8977	0.9723	0.7609	0.6706	0.6508	0.8227	0.9273	0.1560	0.9030	0.8813	0.5619
Dr. Reddy's Lab.	0.0747	0.8560	0.7218	0.9267	0.3206	0.3102	0.7412	0.4392	0.6321	-0.3060	0.3542	0.5143	0.3311
GAIL	0.8579	0.6748	0.3548	0.9727	0.7390	0.8319	0.6065	0.8993	0.4841	0.5944	0.9293	0.9381	0.7007
Grasim Ind.	0.9218	0.8638	0.6564	0.9302	0.6887	0.9184	0.8426	0.9066	0.4408	0.5554	0.9568	0.8379	0.8324
HCL Tech.	0.2701	0.6721	0.7406	0.9749	0.1811	0.4653	0.6961	0.6054	0.8256	-0.2081	0.5481	0.6409	0.3910
HDFC Bank	0.3848	0.4710	0.4846	0.8413	0.5550	0.4741	0.2905	0.6470	0.6013	0.3858	0.6242	0.8125	0.3206
Hindalco Ind.	0.7134	0.9546	0.9612	0.9317	0.9647	0.5581	0.7197	0.9907	0.9790	-0.2070	0.9854	0.9498	0.4122
HUL	-0.0230	-0.3369	-0.1699	-0.2189	-0.5847	-0.1999	0.0566	-0.4637	-0.2528	0.0438	-0.3631	-0.4068	-0.0257
HDFC	0.4716	0.7243	0.4600	0.7077	0.7216	0.8607	0.8514	0.5976	0.4917	0.5029	0.7074	0.7078	0.8455
I T C Ltd.	0.4032	-0.3390	0.0169	0.5221	-0.4275	0.4286	0.7822	0.4593	0.6263	-0.0072	0.5095	0.3309	0.2619
ICICI Bank	0.5766	0.6520	0.8868	0.9734	0.3181	0.6121	0.6895	0.8395	0.8100	0.2127	0.8147	0.8203	0.5645
IDFC	0.6129	0.8720	0.6668	0.9544	0.6479	0.6749	0.7656	0.8930	0.9465	0.1213	0.9801	0.9165	0.5346
IndusInd Bank	0.3029	0.4672	0.6835	0.9410	0.1040	0.4025	0.7575	0.6980	0.9822	-0.1104	0.6420	0.7245	0.3202
JP Associates	0.6631	0.9299	0.7489	0.9189	0.6192	0.6479	0.8645	0.5379	0.2601	0.1490	0.6093	0.4887	0.7256
JSPL	0.3053	0.1312	0.1126	0.0069	0.7305	0.2982	-0.4244	0.1795	-0.2389	0.4907	0.2271	0.2027	0.1414
Kotak Mahindra	0.5444	0.3672	0.7504	0.8821	0.1224	0.4176	0.8815	0.7333	0.8580	0.0646	0.8513	0.5953	0.4741
L & T	0.5722	0.8421	0.4652	0.9864	0.7649	0.7615	0.7067	0.6966	0.5459	0.2437	0.7947	0.8923	0.6010
Lupin Ltd.	0.8867	0.7953	0.5706	0.4463	0.2638	0.9018	0.8543	0.8671	0.3710	0.3431	0.8996	0.6628	0.8425
M & M	1.0000	0.4992	0.7422	0.9175	0.2156	0.7682	0.3387	0.8623	0.2885	0.5559	0.8930	0.7008	0.6832
Maruti Suzuki		1.0000	0.6325	0.8358	0.6854	0.7273	0.8757	0.6061	0.3438	0.0429	0.6543	0.6109	0.7506
NIIT Tech			1.0000	0.9129	0.1306	0.3588	0.8630	0.7729	0.6627	-0.1609	0.7712	0.4617	0.4627
NMDC Ltd.				1.0000	0.8273	0.5110	0.6047	0.8904	0.9397	0.1179	0.9121	0.9571	0.3835
NTPC Ltd.					1.0000	0.5887	0.6157	0.2814	0.0038	0.6676	0.4265	0.6129	0.5209
ONGC						1.0000	0.7933	0.7601	0.3788	0.4654	0.8512	0.7003	0.9188
Power Grid							1.0000	0.6657	0.8164	-0.5753	0.8046	0.4901	0.7792
PNB								1.0000	0.6597	0.3461	0.9778	0.8786	0.6348
Ranbaxy Lab									1.0000	-0.1303	0.6202	0.6568	0.2874
RIL										1.0000	0.4662	0.4966	0.4733
Sesa Goa											1.0000	0.8736	0.7443
SBI												1.0000	0.5667
Sun Pharma													1.0000

	TCS	Tata Motor	Tata Power	Tata Steel	UltraTech C	Wipro
ACC Ltd.	0.5529	0.6256	0.5428	0.8909	0.8608	0.3164
Ambuja	0.8170	0.8542	0.6322	0.8901	0.8881	0.8168
Ashok Leyland	0.5750	0.9411	0.6891	0.9486	0.8723	0.7645
Asian Paints	0.6125	0.8889	0.1494	0.9390	0.8729	0.8082
Axis Bank	0.7013	0.9852	0.8752	0.9860	0.9163	0.9625
Bajaj Auto	0.3336	0.8829	0.7293	0.9637	0.9914	0.9978
BOB	0.4973	0.9072	0.7493	0.9603	0.6127	0.7125
BHEL	0.3886	0.5918	0.7171	0.7705	0.6746	0.1968
BPCL	0.2169	0.5399	0.7931	0.6859	0.4321	0.2993
Bharti Airtel	-0.1748	-0.5964	-0.0470	-0.5159	-0.6470	-0.7756
Cairn India	0.0665	0.6162	0.8768	0.8410	0.4910	0.5429
Cipla	0.5953	0.5307	0.4214	0.5598	0.7010	0.3047
Coal India	-1.0000	-1.0000	-1.0000	1.0000	1.0000	-1.0000
DLF	0.8080	0.8849	0.7847	0.8924	0.9356	0.8992
Dr. Reddy's Lab.	0.7520	0.9272	0.2161	0.8517	0.8743	0.7912
GAIL	0.4004	0.7415	0.9440	0.8873	0.6582	0.3374
Grasim Ind.	0.5073	0.7859	0.8491	0.9376	0.9390	0.3505
HCL Tech.	0.7770	0.9204	0.3554	0.8593	0.8474	0.8442
HDFC Bank	0.4215	0.7739	0.7097	0.7857	0.5565	0.5339
Hindalco Ind.	0.6232	0.9842	0.8506	0.9973	0.8984	0.9644
HUL	-0.0589	-0.4871	-0.7417	-0.3355	-0.0689	-0.3432
HDFC	0.1580	0.5506	0.7154	0.7344	0.7639	0.5092
I T C Ltd.	-0.0788	0.0155	0.3593	0.5455	-0.0335	0.3363
ICICI Bank	0.5807	0.9316	0.6002	0.9030	0.8419	0.8114
IDFC	0.3715	0.8633	0.7355	0.9765	0.8425	0.8774
IndusInd Bank	0.4679	0.8585	0.4654	0.9812	0.6469	0.9171
JP Associates	0.5162	0.6904	0.2859	0.7500	0.9089	0.5058
JSPL	0.0777	-0.0623	0.2518	-0.1852	0.2955	-0.3622
Kotak Mahindra E	0.1501	0.6439	0.3831	0.8481	0.6012	0.8882
L & T	0.5172	0.7853	0.7926	0.9391	0.8229	0.5710
Lupin Ltd.	0.3291	0.6292	0.7250	0.5927	0.7495	0.3418
M & M	0.7702	0.7237	0.7544	0.5798	0.7255	0.1637
Maruti Suzuki	0.5162	0.7632	0.4643	0.9243	0.9094	0.5821
NIIT Tech	0.4806	0.7794	0.0712	0.6897	0.8168	0.8466
NMDC Ltd.	0.8497	0.9387	0.8132	0.9318	0.9070	0.8879
NTPC Ltd.	0.0273	0.3687	0.7603	0.5619	0.4801	0.0757
ONGC	0.2439	0.4772	0.7856	0.6137	0.7476	0.3286
Power Grid	0.1517	0.5904	0.3259	0.7635	0.8730	0.8426
PNB	0.4985	0.9424	0.8028	0.9530	0.7213	0.5500
Ranbaxy Lab	0.3967	0.7616	0.4046	0.9761	0.5910	0.8910
RIL	-0.3343	-0.1317	0.6877	-0.0533	-0.0452	-0.1985
Sesa Goa	0.3839	0.8827	0.8467	0.9792	0.8025	0.5058
SBI	0.4686	0.8398	0.9100	0.9144	0.6403	0.5320
Sun Pharma	0.1489	0.3906	0.6389	0.4409	0.7450	0.3917
TCS	1.0000	0.6851	0.1173	0.4417	0.6347	0.4447
Tata Motors Ltd.		1.0000	0.5450	0.9174	0.8244	0.8537
Tata Power			1.0000	0.6761	0.3601	0.2587
Tata Steel				1.0000	0.8544	0.9050
UltraTech Cement					1.0000	0.7495
Wipro						1.0000

Table 4: Various Mutual Funds schemes and their Risk & Return			
Sr. No.	Mutual Fund Scheme	Return (%)	Risk (%)
1	ICICI prudential flexible income plan	102.3265	300.7961
2	Reliance growth	45.9966	61.0028
3	Birla sun life mid cap fund- plana- growth	40.0570	56.4246
4	Templeton india growth fund	36.9143	56.2645
5	HSBC equity fund	36.4962	55.3411
6	HDFC equity fund	39.8031	52.8025
7	Birla sun life equity fund	38.1980	52.0131
8	ICICI prudential Mid cap fund	23.7402	50.1780
9	L&T mid cap fund	22.6533	48.5509
10	HDFC growth fund	35.9093	48.0751
11	LIC nomura MF growth fund	28.4747	47.8868
12	JM equity	27.4773	46.7556
13	LIC nomura equity fund	24.8332	44.3178
14	DWS investment opportunity fund	20.0334	44.0401
15	Birla sun life index fund-growth	25.4157	40.4844
16	Canara robeco equity diversified	22.5617	39.2893
17	Baroda pioneer growth fund- dividend	14.5951	39.1947
18	BNP paribas equity fund- growth	19.3218	38.2295
19	Dws alpha equity fund	20.2509	36.8446
20	HSBC india opporunitites fund	17.6301	36.2730
21	Canara reobeco balance	26.6816	34.7736
22	JM balanced fund	10.4778	34.6929
23	LIC normura balance fund	17.5100	32.0618
24	ICICI prudential balanced	23.6050	31.4816
25	FT india balanced fund	23.3463	31.2819
26	HDFC balanced fund	23.5494	31.2043
27	Birla sun life aggressive plan- growth	15.9787	30.8921
28	Baroda pioneer balance fund- growth	13.4290	30.1147
29	Kotak balance	13.1548	29.6749
30	Baroda pioneer balance fund- dividend	11.7459	27.1002
31	ICICI prudential aggressive plan	16.2068	26.1033
32	TEMPLETON INDIA pension plan	14.7334	18.6061
33	L&T ultra short term fund	2.0571	15.6931
34	Canara robeco monthly income plan	11.8340	11.1809
35	ICICI prudential long term gilt fund	8.3870	11.1447
36	HSBC MIP -savings plan	8.1112	8.7946
37	Kotak monthly income plan	6.0713	8.0614
38	Canara robeco income scheme	8.8511	7.7616

39	Birla sun life short term fund- reg- growth	7.5320	7.6515
40	Birla sun life income plus- reg- growth	7.4231	7.1668
41	Birla sun life monthly income - reg- growth	10.0235	7.1019
42	BNP paribas short term income fund	2.9407	7.0784
43	BNP Paribas flexi debt fund- growth	6.8372	6.9558
44	Baroda pioneer gilt fund- dividend	6.0953	6.1376
45	Reliance income fund	7.3361	5.9175
46	HSBC income fund- investment plan	6.9730	5.3711
47	L&T monthly income plan	7.6733	5.0563
48	ICICI PRUDENTIAL short term gilt fund	7.3620	4.8886
49	JM income fund	3.5233	4.5674
50	HDFC income fund	6.4006	4.5587
51	LIC nomura bond fund	6.8502	3.8154
52	DWS short maturity fund	6.8675	3.5428
53	Kotak equity fof	5.8134	3.4081
54	Templeton India income fund	6.0189	3.2434
55	HDFC short term plan	7.5060	2.8763
56	DWS ultra short term fund	6.3363	2.8523
57	Canara robeco treasury advantage fund ret growth	6.2890	2.8513
58	Reliance medium term fund	6.1243	2.6181
59	JM floater short term fund	5.8543	2.4795
60	Baroda pioneer income fund- dividend	5.5080	2.4789
61	JM floater long term fund	5.6670	2.4531
62	Kotak bond short term plan	7.4244	2.2751
63	HSBC income fund STP	6.7151	1.9505
64	HDFC liquid fund	6.6954	1.9468
65	HDFC cash management fund saving plan	6.8927	1.8517
66	Templeton floating rate income fund	6.9778	1.7517
67	Baroda pioneer liquid fund- regular growth	6.4784	1.6775

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