PEZZOTTAITE JOURNALS

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 7.306
H5-Index: 1, H5-Median: 1, H-Citations: 1

SECTORAL COMPOSITION OF ECONOMIC GROWTH IN INDIA

Garima Verma[1]

ABSTRACT

This paper analyses growth performance of Indian economy in terms of GDP and its sectors for the period of 1991-92 to 2016-17. India has determined a strategic economic development to achieve rapid economic growth. In the developing countries, fiscal policy plays a dynamic role in the advancement and rapidity of the pace of economic development. Sectoral growth performance is assessed in this chapter during the course of development. Instead sectoral growth rates have uneven nature, the present study analyses the overall sectoral composition of economic growth. It examines the trend of the performance of the primary sector, secondary sector and tertiary sector relating to the GDP after the period of economic reforms. It concludes that development of all the economic sectors is essential for overall economic growth and sustainable development.

KEYWORDS

Agriculture, Service Sector, Economic Growth, Gross Domestic Product etc.

INTRODUCTION

Agriculture had been an important sector in the economic development since the beginning of modern civilization. In the developing countries, primary sector especially agriculture has been a major sector for contribution in gross domestic product. It had been a pride of the economic scenarios in our country. It is a major field of employment as being source of livelihood of nearly 65 percent of the total workforce in our country. However, on the one side dependency of agriculture on the monsoon and another side absence of modern technologies made it merciful situation in our country. India started its journey towards economic development with a broad strategy based on historical experiences of our country and guidelines of other countries.

With a new economic policy of LPG, a new phase of economic reforms was begun. India stroke into a new strategy for making country developed with improvisation of economic situation. Industrialization is regarded as one of the greatest revolutions. In the secondary sector, it was possible for government to enhance the productive capacity by adopting modern and advanced technologies.

The manufacturing sector not only gave job but also provided transitional opportunity to the labor force from agriculture. Expansion of primary and secondary sector made the advancement of service sector. Tertiary sector provides a major part of the inputs to the other sectors of economy as people serve their knowledge, time and physical labor to extract and produce goods in the agricultural sector and industrial sector. In recent times, service sector contributes a major percentage to the gross domestic products. The relocation of surplus labor from primary sector to tertiary sector is much greater than the relocation of labor from primary sector to secondary sector. Labor absorption is possible at greater level in the service sector. Hence, the service sector is regarded as the key sector to generate more opportunities for employment and economic growth.

REVIEW OF LITERATURE

Literature reveals that economic growth and continuity of government deficits have been observed in many countries, as it is an important issue of concern.

Shri Sanjay K. Hansda (2003) in his working paper finds that the services sector has been the mainstay of Indian growth process in1990s. Indeed, contribution of the services sector to the overall GDP growth peaked an all-time high of 65.1 per cent in the 1990s up from 43.6 per cent in the 1980s. As a result, the services share in GDP touched the mark of 48.5 per cent in 2000-01. The service sector stands out as more growth inducing than industry or agriculture.

D.V.S.Sastry, Balwant Singh, Kaushik Bhattacharya, N.K.Unnikrishnan (2003) in their paper examine the linkage of growth among agriculture, industry and services sector of the economy. They find that there is a substantial increase in the share of the services sector in GDP over years. It highlights the sustainability of a relatively high GDP growth in recent years driven by growth of service sector.

[1]Research Scholar, Department of Economics, J.N.V.U., Rajasthan, India, vermagarima741@gmail.com

Virmani Arvind (2004) analysed the performance of the total factor productivity of the economy. This paper shows that contribution of total factor productivity to growth of NDP continuously fell down from 85% in 1951-52 to a little over 25% in 1991-92. Formal econometric analysis shows that investment in machinery and structures play vital role in the rate of growth of total factor productivity.

P.Jegadish Gandhi and P. Ganesan (2007) criticised the performances, problems and perspectives of services sector in the Indian economy. In the process of economic development, a simultaneous growth of primary, secondary and tertiary sectors is required. But Since 1980s the share of services sector in the real GDP in India has surpassed that of agriculture and industry.

Tushar Poddar and Eva Yi (2007) classified growth into the key sectors of agriculture, industry and services. Industry is increasingly becoming an important growth driver. Recent increases in industrial productivity has rebounded from negative to positive. Services productivity has remained strong over the past few decades. Labour has moved into industry from agriculture, while capital has moved to services since 2002.

Jogender Sharma (2010) says that India has traditionally been an agrarian economy. However, use of traditional methods of cultivation and greater dependence on monsoon had put the agriculture in a distressed situation, thereby adding to economic woes of the rural mass dependent on it. However, those days have passed. Now most of the companies belonging to various sectors like telecom, automobiles, banking and financial services have explored the rural marker and want to increase their exposure to this sector.

Eichengreen Barry and Gupta Poonam (2011) describes that India plays vital role in service sector as a developing country. It shows that modern services have been growing rapidly with significant impact on macroeconomics. Excess labour is required to be shifted from agriculture to both manufacturing sector and service sector so that living standard and sustainable economic growth can be enhanced.

Fauzi Hussin1 & Soo Yoke Yik (2012) examined the contribution of economic sectors to economic growth in both countries China and India by using time series data from 1978 to 2007. All the three economic sectors have been analysed in this paper. It shows that manufacturing sector has highest continuation in China, while service sector has highest contribution in India. If Value added for service sector increases by 1%, real GDP per capita is likely to increase by 0.4789%. Service sector is more significant in both countries.

K. Sivasubramaniyan. (2017) expressed that a large poverty in India led to slow progress of country. This paper analysed the sectorial contribution of economic growth of the three states of India- Andhra Pradesh, Tamil Nadu and Karnataka. In Tamil Nadu, the agriculture sector has been declining over the years whereas service sector is improving. Employment scenario shows major contribution of agriculture sector in giving jobs to major population. Thus, all the three sectors are important in the sustainable development and growth of economy.

OBJECTIVES

To examine the gross domestic product in India.
To study the sectoral contribution to economic growth in India.

RESEARCH METHODOLOGY

For the completion of this paper, we have employed statistical tools. The data have been classified and tabulated using Microsoft Excel software. The paper attempts to study the sector wise contribution to economic growth. Graphs have been used to elaborate the data. The used data in this research work are purely secondary.

Data Sources

The study is entirely based on secondary data. Relevant data for the study are obtained from Database of Statistics on Indian Economy from Reserve Bank of India, Central Statistics Office, Economic Survey of India, Relevant articles, economic journals, textbook from libraries etc.

GROSS DOMESTIC PRODUCT OF INDIA

Economic growth implies the spread of economy in the production of goods and services over a specific time. Economic growth is lucrative for all economic activities, for raising the standard of living and status of the country. Economic growth generates more employment by creating more profits for business. This profit attracts the companies to invest capital in business sector. It needs

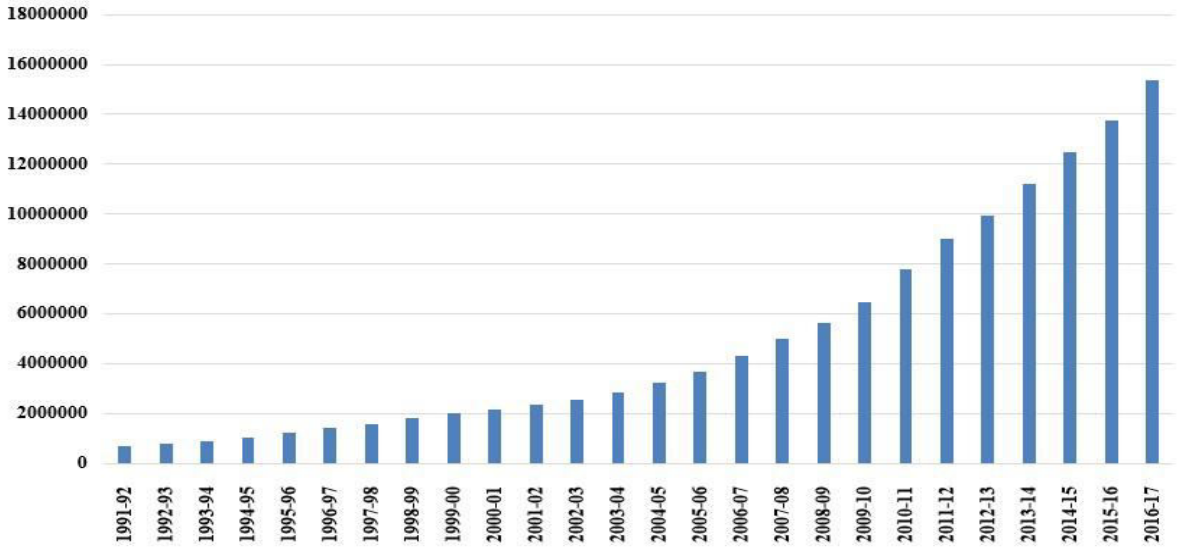
to hire more employees to do work in their company, so many people get jobs and their income level rise. Due to increased income level, consumers demand more goods and service. This leads to rise in production and higher economic growth. The best way to measure economic growth is GDP. Increment in GDP implies the enhancement in a country's production. It covers all the final production or economic output of the country. It takes into account all goods and services that are produced within a territory of a country they are either sold in domestic territory or overseas.

Table-1: Gross Domestic Product at MP (at Current Price) (Rs. Crore)

Year	GDP	Year	GDP	Year	GDP
1991-92	673875	2000-01	2177413	2009-10	6477827
1992-93	774545	2001-02	2355845	2010-11	7784115
1993-94	891355	2002-03	2536327	2011-12	9009722
1994-95	1045590	2003-04	2841503	2012-13	9944013
1995-96	1226725	2004-05	3242209	2013-14	11233522
1996-97	1419277	2005-06	3693369	2014-15	12467959
1997-98	1572394	2006-07	4294706	2015-16	13771874
1998-99	1803378	2007-08	4987090	2016-17	15362386
1999-00	2023130	2008-09	5630063		

Sources: Handbook of Statistics of Indian economy RBI

Graph-1: Gross Domestic Product



Sources: Handbook of Statistics of Indian economy RBI

Table 1 shows the figure of gross domestic product at market price at current price. It shows continuously increasing trend over the years. It was Rs. 673875 crores in 1991-92, which reached to Rs.1226725 crores in 1995-96. It has reached to Rs. 15362386 crores in 2016-17.

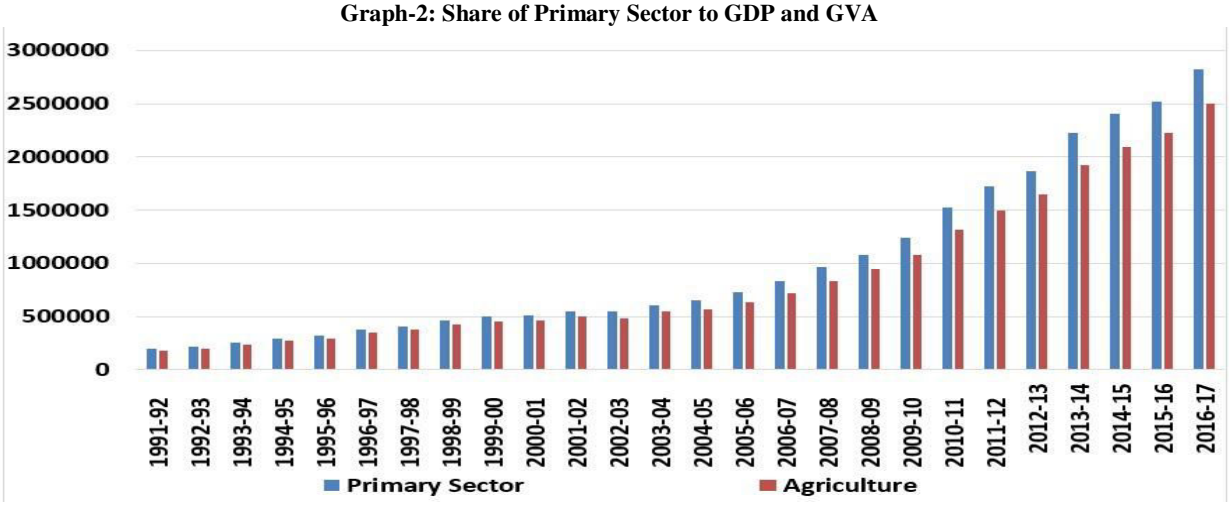
SECTOR WISE CONTRIBUTION TO GROWTH IN INDIA

Agriculture had been an important sector in the economic development since the beginning of modern civilization. The developed countries have been developed based on agricultural sector initially and then industrial sector's development. Agriculture is the backbone of Indian economy. It had been a pride of the economic scenarios in our country. It is a major field of employment as being source of livelihood of nearly 65 percent of the total workforce in our country. This graph gives an overview of the Primary sector and agriculture sector in India by analyzing its performance for the period of 1991-92 to 2016-17. Data indicates a slowdown in agricultural growth since 1991. There may have multiple factors behind slow growth of agriculture such as stagnation of public investment, reduced production due to fragmented holdings, slackness of irrigation expansion and environment stress etc. The percentage share of primary sector in national income was 31.86 percent in 1991-92. This share has declined to 30.67% in 1994-95, 28.22% in 1997-98, 27.95% in 1998-99.

PEZZOTTAITE JOURNALS

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 7.306
H5-Index: 1, H5-Median: 1, H-Citations: 1

Graph-2: Share of Primary Sector to GDP and GVA

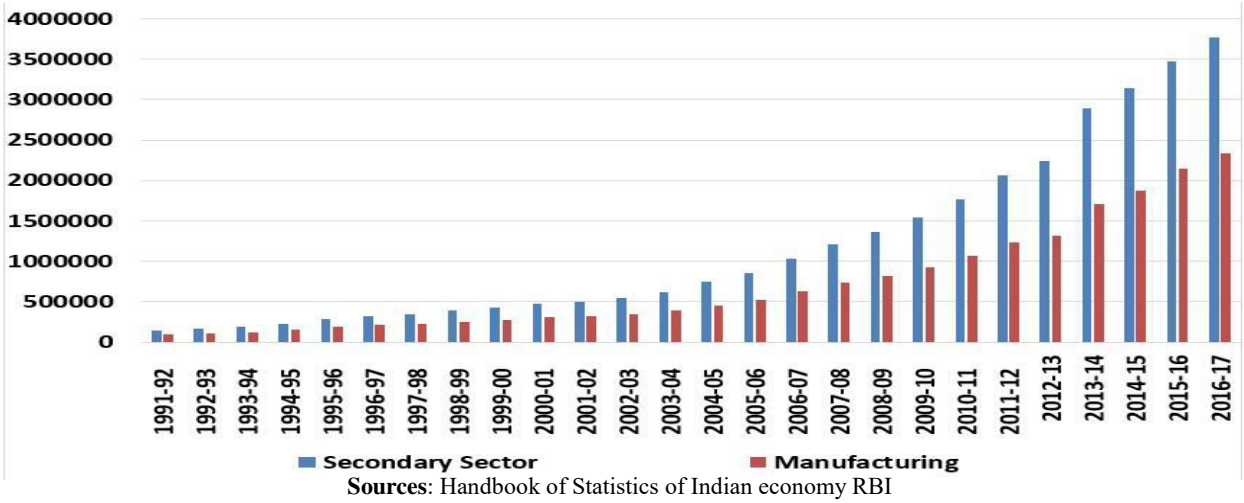


Sources: Handbook of Statistics of Indian economy RBI

This showed continuously declining trend in the production contribution of primary sector. It started to bring down from 25.31% in 2000-01 to 23.18% in 2003-04 and further declined to 21.60%, 20.99%, 20.98% in the year 2005-06, 2006-07, 2007-08 respectively. In the year 2008-09, the contribution of primary sector was 20.42% of gross domestic product. It increased to 21.03% in 2010-11 but then showed decreasing trend as 19.89% in 2012-13. The next year i.e. 2013-14 showed a significant increase in agricultural production as it increased to 21.44% of gross value added. After that, it started to decline and reached to 20.22% of GVA. The downfall in the production of agriculture crops such as oilseeds, cotton, jute, sugarcane etc. was the reason behind the decline in growth of agricultural sector. Having a good monsoon in 2016-17 increased the area coverage under wheat by 2.94 lakh hectors to 246.83 lakh hectors. The total production of wheat was 97.4 million tons in 2016-17 and for rice, it was 109.2 million tons. Horticulture crops have been increased sharply over the time of 2012 to 2015. To reduce the environmental risks in agriculture, government adopted effective means for forecasting weather with using advanced technologies, which may be beneficial for farming community.

Industrialization is regarded as one of the greatest revolutions in the world of economy. Industrial sector is of great importance for economic development of country. Though primary sector is fundamental and vital, there is natural limit on it. While in the secondary sector, productive capacity can be enhanced by adopting modern and advanced technologies. Secondary sector includes all activities, which convert raw materials into finished goods. Sometimes it is known as production sector. Industrial sector is the second largest sector of our economy as it has economic growth and very crucial for all the countries in the prospect of being developed. It is fact that all that countries having strong industrial sector have showed speedy progress in the process of development, improvisation in national income and standard of living.

Graph-3: Share of Secondary Sector to GDP and GVA



Sources: Handbook of Statistics of Indian economy RBI

The performance of industrial sector improved with the introduction of new economic policy of 1991 and various reforms although this industrial growth has been sluggish. With the liberalization policy, import restrictions were reduced in the end of 1991-92. This led to a better performance of industrial sector however; industrial sector was suffering from recessionary conditions. The percentage share of secondary sector to GDP was 22.93% in 1991-92, which increased to 23.29% in 1992-92 because of various industrial reforms. Further, it increased to 24.45% of GDP in 1996-97 although it was lower than the last year mainly because of weak performance of electricity generation sector. Manufacturing sector, which has largest contribution in secondary sector, witnessed lower growth that is 16.94% in 1996-97.

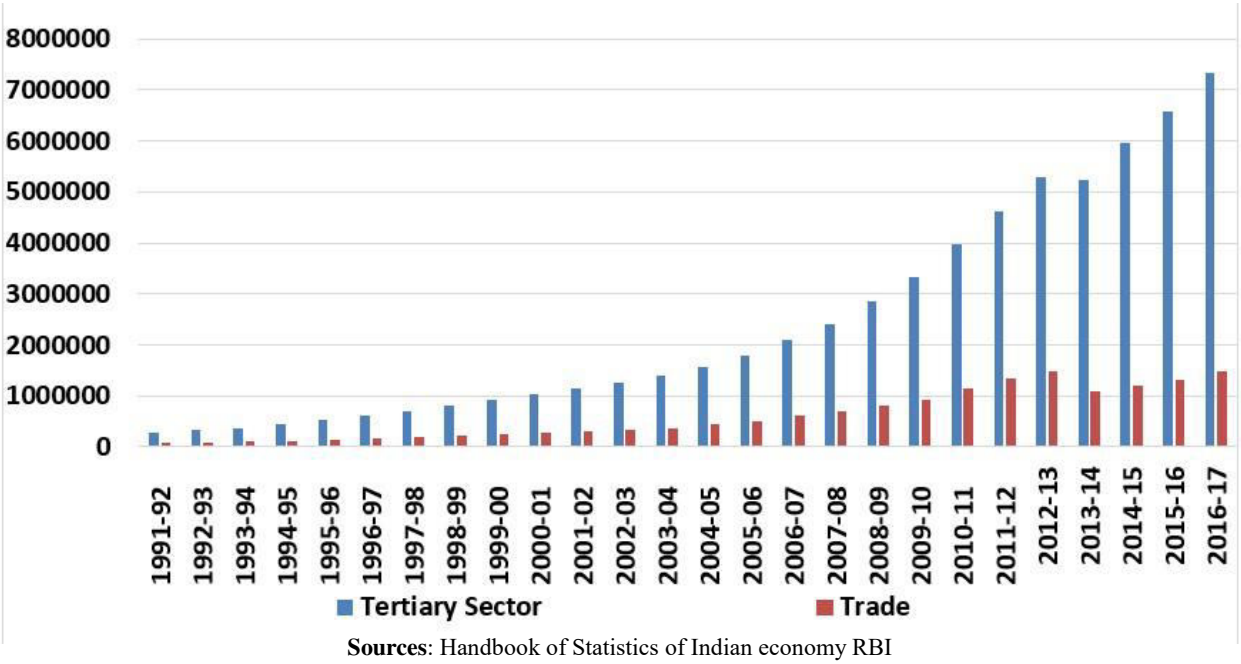
In the following year, 1997-98 manufacturing sector's contribution fell down to 15.85%. Capital goods performed negative growth this year. The contribution of secondary sector as percentage to GDP increased to 23.71% in 2000-01. The next year there was decline to 22.87% in 2001-02. It rose up to 26.14% and 26.31% in the year 2006-07 and 2007-08 respectively. In the year 2010-11, the percentage share of secondary sector reduced to 24.33% of GDP from 25.15% of GDP in 2009-10. By 2013, the growth rate of India fell to the low level.

The Prime Minister 'Narendra Modi' launched the "Make in India" initiations in September 2014 with the objective to transform India into a global hub of manufacturing and innovation. Industrial sector showed higher growth during 2015-16 due to good performance of manufacturing sector. In 2015-16, the contribution of the manufacturing sector to gross value added was 17.07%. In 2016, the government brought many sectors under automatic approval route, which encouraged FDI in our country. The Indian economy witnessed a significant increase in FDI in 2016-17. The secondary sector is accounted for 27.06% of the total gross value added (GVA) in 2016-17. The industrial sector is an important contribution to the growth. Indian government has been putting initiatives to accelerate investment and productivity of industrial sector in overall growth.

Progress of civilization leads to the evolution of economic activities in the same context. Expansion of primary and secondary sector made the advancement of service sector. The tertiary sector of an economy is also regarded as the service sector or the service industry. In the economic literature, services are defined as "intangible goods". It consists of specially trade and public services and many others economic growth and is expanding at a faster rate. Tertiary sector provides a major part of the inputs to the other sectors of economy as people serve their knowledge, time and physical labour to extract and produce goods in the agricultural sector and industrial sector.

Service sector includes various economic activities such as trade, hotel and restaurants, transport and communications, financial institutions, real estates, insurance, community and social services, personal services such as health, education, NGO's etc. Tertiary sector is also very essential for overall development in all the sectors of economy. In recent times, service sector contributes a major percentage to the gross domestic products.

Graph-4: Share of Tertiary Sector to GDP and GVA



Sources: Handbook of Statistics of Indian economy RBI

The steady growth has been witnessed in service sector. It has been contributing important proportions to gross domestic product in Indian economy continuously. The contribution of tertiary sector to GDP was 44.96% in 1991-92, which rose to 45.22% of GDP in the year 1992-93. As per the report of NSSO, the overall national figure for literacy increased from 52.2% in 1991 to 62% in 1997. The budgetary support on rural development and rural employment and poverty alleviation was increased to Rs. 9811 crores in 1998-99(BE) from Rs. 8290 crores in 1997-98 (RE). The percentage share of tertiary sector to gross domestic product was 50.98% in 2000-01. This percentage increased in the next year, i.e. 51.99% in 2001-02.

Service sector has been playing significant role in contribution to economic growth. The percentage share of service sector to gross domestic product reached to the level of 53.06% in 2005-06. After reaching this level, it showed a slightly decline as its share was 52.87% and 52.71% in 2006-07 and 2007-08 respectively. Trade has an important contribution in GDP. The GDP from trade was Rs. 71149 crores in 1991-92, which increased to Rs. 923004 crores. In the year, 2014-15 service sector's contribution accelerated to 51.83% of gross value added from 50.62% in 2013-14.

The major reason behind this acceleration was higher growth in sub- sectors like trade, repair, hotels & restaurants, defense etc. Tertiary sector remained the key driver of India's economic growth by contributing 52.33% of GVA in 2015-16. Although primary sector is the dominant sector, instead of that Indian economy has been witnessing continuously increase in the share of service sector over the years.

CONCLUSION

This paper studied the major performance of sectoral contribution to GDP in India since 1991-92 to 2012-13 and to contribution to GVA since 2013-14 to 2016-17. This paper supports various policies of government such as liberalization policy, reduction in licence system, enhancing exports, encourage service sector etc. to improve the contribution of various sectors in gross domestic product. This paper suggests that government should focus more on improving agricultural conditions and should adopt various means for forecasting weather to help in the protection of crops. Along with industrial development, new field in service sector should be encouraged in context to generate employment and to reduce poverty. Thus, we can say that for sustainable growth of economy depends on the overall development of all the three sectors of economy.

REFERENCES

Sastry, D. V. S., et al. (2003), Sectoral Linkages and Growth Prospects Reflection on the Indian Economy. *Economic and Political Weekly*, Vol. 14, June 14, p. 2390-2396

Barry, E., and Poonam, G. (2011). *The Service Sector as India's Road to Economic Growth*. NBER Working Paper No. 16757.

Hussin, F., & Yik, S. Y. (2012). The Contribution of Economic Sectors to Economic Growth: The Cases of China and India. *Applied Economics,* Vol. 4, No. 4

Gautam, H. R. (2010). The path of Indian Agriculture and way ahead. *Kurukshetra*, Vol. 58, No.3, p. 7-10

Jegadish. G. P., and Ganesan P. (2007). *Services in the Indian Economy*, New Delhi: Deep and Deep Publication. Sivasubramaniyan,

K. (2017). "Sectoral contribution and their relevance in india: with special reference to three south indian states. *International Journal of Research - Granthaalayah*, 5(9), 116-123.

Tushar, P., and Eva, Yi. (January 22, 2007). *India's Rising Growth Potential.*

Ravallion, M., and Gaurav, D. (1996). How Important to India's Poor is the Sectoral Composition of Economic Growth? *World Bank Economic Review,* 10. p. 1-26**.**

Mazumdar, S. *Growth and Structural Changes in Output in India since Independence: A Study Report*. Sponsored by Indian Council of Social Science Research (ICSSR).

Sharma, J. (2010). Rural India – The New Growth Engine. *Kurukshetra*, Vol. 58, No. 3, p. 18 -20

Virmani, A. (2004). *Sources of India's Economic Growth: Trends in Total Factor Productivity*. Working paper 131, Indian Council for Research on International Economic Relations.

*****

PEZZOTTAITE JOURNALS

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 7.306
H5-Index: 1, H5-Median: 1, H-Citations: 1

AN ECONOMETRICS ANALYSIS OF EXCHANGE RATE OF INDIA: ARCH FAMILY MODEL

Dr. Achal Kumar Gaur[2] Dr. Pragyesh Nath Tripathi[3]

ABSTRACT

The paper focuses on the various ARCH family model for exchange rate of the Indian rupee (monthly average and end-month rates) vis-à-vis the SDR, US dollar, Pound Sterling, Euro and Japanese Yen for the period march 1992- July 2017. The unit root test results indicate that all the variables are non-stationary at level but it becomes stationary at first difference. Further, the presence of ARCH effect in the exchange rate series are measured by the ARCH-LM test and residual plot. Once the ARCH effect is observed then we chose the best fitted model on the basis of Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC). The mixed results have been found for exchange rate of the Indian rupee (monthly average and end-month rates) vis-à-vis the SDR, US dollar, Pound Sterling, Euro and Japanese Yen for the period march 1992- July 2017 [i.e. in case of SDR (average) we chose ARCH-05 model and SDR (End-month) GARCH model have chosen and so on]. The heteroskedasticity test result indicates that the selected model for the exchange rate of the Indian rupee (monthly average and end-month rates) in the selected currency of the world for the period march 1992- July 2017 are free the problem of heteroskedasticity, except USA (End-month) and Japanese Yen (Average) for EGARCH model. And, finally the autocorrelation test result indicates that the selected model for the exchange rate of the Indian rupee (monthly average and end-month rates) in the selected currency of the world for the period march 1992- July 2017 are free the problem of autocorrelation, except USA (End-month) and Japanese Yen (Average) for EGARCH model.

KEYWORDS

Exchange Rate, Unit Root Test, Volatility, ARCH-LM Test and India etc.

INTRODUCTION

An international exchange rate means the price of one country`s currency in terms of another country currency. The exchange rate plays a very important role when two countries are trading their commodity to each other. The factors such as interest rates and inflation are the most important determinants of the exchange rate as well as the country's relative level of economic condition. The development of the India is nominal and real exchange rates over the past two decades, describing short-term movements and volatility. A number of factors including government policy, especially foreign exchange, market intervention, capital controls and monetary policy, influences exchange rate movements. This paper investigate the volatility of exchange rate in Indian rupee in terms of SDR, US Dollar, Pound Sterling, Euro and Japanese Yen during the period march 1992- July 2017. India's exchange rate management and monetary policy are closely linked as the Reserve Bank of India (RBI) is responsible for foreign exchange market interventions and is the manager of the foreign exchange regulation act (FEMA, 2004), with the mandate of "promoting the orderly development and maintenance of foreign exchange markets in India". Maintenance of foreign exchange markets is associated with very active management of controls on international capital movements and frequent foreign exchange market intervention operations in addition to consideration of the effects of interest rate changes on the exchange rate. These considerations make understanding the linkages between monetary policy, capital controls and foreign exchange market intervention operations to a study of exchange rates in India.

OBJECTIVE OF STUDY

The main objective of this paper to examine the exchange rate volatility of the Indian rupee (monthly average and end-month rates) vis-à-vis the SDR, US dollar, Pound Sterling, Euro and Japanese Yen for the period March 1992- July 2017.

HYPOTHESIS OF STUDY

The exchange rate of the Indian rupee (monthly average and end-month rates) vis-à-vis the SDR, US dollar, Pound Sterling, Euro and Japanese Yen have not been volatile during the period of March 1992- July 2017.

[2] Professor & Head, Department of Economics, Faculty of Social Sciences, B.H.U., Uttar Pradesh, India, gaurecobhu@gmail.com
[3]Assistant Professor, Department of Economics, D.B.K.N. College, Bihar, India, pragyeshnath@gmail.com

DATA SOURCE

In analyzing the above objective as well as hypothesis the exchange rate date of Indian rupee (monthly average and end-month rates) vis-à-vis the SDR, US dollar, Pound Sterling, Euro and Japanese Yen for the period march 1992- July 2017 have been collected from various issue of the Hand Book of Statistics, RBI, India.

This paper has divided into five sections. In the first section, include the introduction, object, hypothesis and sources of data, while second section presents the review of literature. Further, methodology of the present study is discuss in the third section, although section four focus on the empirical results and discussion. In addition, finally conclusion of the study.

REVIEW OF LITERATURE

There is a wide number of literature available for guiding the uses of the ARCH family model for measuring volatility in time series econometrics. These are the:

Caporale et al. (2009) suggested that external, real and monetary shocks are responsible for exchange rate volatility in emerging countries with international financial integration, as the main driving force therefore financial integration and economic liberalization should be pursued steadily in developing countries. Since 1973, from the collapse of Bretton woods system, exchange rates of various countries have been fluctuating frequently. These wayward movements of FDI stimulate uncertainty, which puts the investor in dilemma of how to interpret these changes. Investors; in an indecisive mode may postpone the investment which results in reduction of FDI. Therefore, it is important to find out whether there exist a robust relationship between FDI and exchange rate volatility of Pakistan. Froot and Stein (1991) presented the relative wealth effect hypothesis of exchange rates. Increase in exchange rate increases the relative wealth of host country investors, which results in boom of FDI inflows. Inflation is used as an indicator of the quality of macroeconomic management so the conceivable relationship between FDI and inflation is negative. Whereas, FDI is expected to be positively linked with trade openness which is commonly used proxy of the degree of openness of the economy in the empirical research.

ARCH family models are frequently used for measuring the volatility in exchange rate time series. Most of the articles in this area of the literature deal with the analysis of the exchange rate volatility or with the forecast of the exchange rates. The autoregressive conditional heteroskedasticity (ARCH) method for measuring volatility has been introduced by (Engle, 1982), which modeled the heteroskedasticity by relating the conditional variance of the disturbance term to the linear combination of the squared disturbances in the recent past. The GARCH model is a generalized ARCH model which was obtained by (Bollerslev, 1986) by modeling the conditional variance to depend on its lagged values as well as squared lagged values of disturbance. Other models from the ARCH family are: the EGARCH model which was proposed by Nelson (1991) or the TARCH model introduced independently by Glosten, Jaganathan, and Runkle (1993) and Zakoïan (1994). Various ARCH models have been applied by researchers to analyze the volatility of exchange rates in different countries. For example some studies are: (Benavides, 2006) in which the author analyses the volatility forecast for the Mexican Peso – U.S. Dollar exchange rate, (Trenca et. al., 2011) which analyzes the evolution of the exchange rate for: Euro / RON, dollar / RON, yen / RON, British pound / RON, Swiss franc / RON for a period of five years from 2005 until 2011, (Alam et. al., 2012) in which the authors analyze exchange rates of Bangladeshi Taka (BDT) against the U.S. Dollar (USD) for the period of July 03, 2006 to April 30, 2012, (Musa et. al, 2014) forecast the exchange rate volatility between Naira and US Dollar using GARCH models.

Spulbar et. al., 2012 in which the impact of political news and economic news from euro area on the exchange rate between Romanian currency and EURO is analyzed using a GARCH model.

Hartwell, 2014 in which is analyzed the impact of institutional volatility on financial volatility in transition economies using a GARCH family approach (the paper posits that institutional changes, and in particular the volatility of various crucial institutions, have been the major causes of financial volatility in transition and the researcher examines 20 transition economies over various timeframes within the period 1993 - 2012). Teyssiere, 1998, a vast and very good written study, in which two classes of multivariate long memory ARCH models are considered.

METHODOLOGY

This section covers the methodologies are unit root test (Dickey-Fuller and Augmented Dickey-Fuller Tests) and Auto Regressive Conditional Heteroskedastic (ARCH) processes.

Unit Root Test

Various empirical work have been done so far in time series data to analysis the trend break in the GDP in Indian economy. In order to analysis the India's growth structure time series data is required but it was well knAuthors that the series are non-

stationary (it poses unit root) at level. Broadly, a series are non-stationary when the mean, variance, and covariance are increases with time (i.e., it changes over a period of time). Since econometrics modeling with the desirable statistical properties of the estimator are given the misleading information, so it has necessary to test the series are stationary or not before using the econometrics excises. A simple first order autoregressive process can be expressed by the following equation:

$$Y_t = \text{[illegible]} + \text{[illegible]}Y_{\text{[illegible]}-1} + \text{[illegible]}_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where Y_t is the stochastic process, μ, and α are parameter and [illegible]_t is a random disturbance term with white noise properties. The parameter of above equation gives the nature of time series. If $\mu \neq 0$ and $\alpha < 1$, then Yt follow a deterministic trend. The presence of autoregressive component with time trend is called the Trend Stationary Process (TSP). If the time series is said to follow a simple random walk then it is called unit root process. Any non-stationary process, which become stationary after taking difference, it is called the difference stationary process.

There are three different model in time series. The first model is without drift, second model is with drift and third model is with drift plus time trend. The equation of all three model is:

Without drift and without time trend (Model - 1)

$$Y_t = \text{[illegible]}Y_{\text{[illegible]}-1} + \text{[illegible]}_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

With drift and without time trend (Model - 2)

$$Y_t = \text{[illegible]} + \text{[illegible]}Y_{\text{[illegible]}-1} + \text{[illegible]}_t \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

With drift and with time trend (Model - 3)

$$Y_t = \text{[illegible]} + \text{[illegible]}Y_{\text{[illegible]}-1} + \text{[illegible]} + \text{[illegible]}_t \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

In the econometrics literature there are several test for the non-stationary time series. The Dickey-Fuller (DF), Augmented Dickey- Fuller (ADF) and Philips and Perron unit root test. In this paper, we are useing the DF and ADF test.

Dickey-Fuller and Augmented Dickey-Fuller Tests

Dickey-Fuller test examines whether the value of parameter $\text{[illegible]} = 1$ in the first equation than the model have unit root. In other words, the first order autoregressive has unit root.

Specifically, assuming their absence of trend term in equation (4), and then the equation (4) can be written as:

$$\Delta Y_t = \mu + \text{[illegible]}Y_{\text{[illegible]}-1} + \text{[illegible]}_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Where: $\Delta Y_t = Y_t - Y_{\text{[illegible]}-1}$ and $\text{[illegible]} = \text{[illegible]} - 1$.

The null hypothesis is that there is unit root, i.e.

$$\text{[illegible]}_0: \text{[illegible]} = \text{[illegible]} - 1 = 0$$

The alternative hypothesis is that there is no unit root, i.e.

$$\text{[illegible]}_1: \text{[illegible]} < 0 \text{[illegible]}$$
$$N\text{[illegible]}a\text{[illegible]}i\text{[illegible]}$$

More generally, if the time series follows a autoregressive process in order p or even moving average process an extended Dickey-fuller test called augmented Dickey-fuller (ADF) test.

The main problem of Dickey and Fuller test is that the error term are serially correlated. Remove the problem of serial correlation, ADF test is used. ADF is the modified version of Dickey-Fuller Test (DF) which includes extra lagged terms of the dependent variables in order to eliminate the problem of autocorrelation. The lag length of dependent variable is either determined by Akaike Information Criteria (AIC) or Schwartz Bayesian Criteria (SBC). So before apply the ADF test first checked the lowest value of AIC or SBC and then determine the lag length of dependent variable as an explanatory variable.

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 7.306
H5-Index: 1, H5-Median: 1, H-Citations: 1

So, if the original time series follows AR (p) process, than the augment Dickey-fuller (ADF) test uses the following regression:

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \sum_{i=1}^{p} \gamma_i \Delta Y_{t-i+1} + \varepsilon_t \quad \text{..... (6)}$$

The time series Y_t is stationary then, the Y_{t+h} series has the same distribution as the Y_t series for any $t = 1, 2, \ldots, n$ (Enders, 1995).

Auto Regressive Conditional Heteroskedastic (ARCH) Processes

When the variance of a stochastic variable varies (i.e, changes) over a period of time is called heteroskedastic. ARCH process had capture the volatility of the time series data. Engle (1982) had developed ARCH model in terms of mean and the variance of the series. In the Engle's methodology, it is proved that the conditional forecasts are vastly superiors to unconditional forecasts. Suppose the model is:

$$Y_t = \alpha + \beta Y_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots (7)$$

The conditional mean of Y_{t+1} is

$$E_t Y_{t+1} = \alpha + \beta Y_t \ldots\ldots\ldots\ldots\ldots (8)$$

The conditional variance of Y_{t+1} is

$$E_t[(Y_{t+1} - \alpha - \beta Y_t)^2] = E_t \varepsilon_{t+1}^2 = \sigma^2 \ldots\ldots\ldots\ldots\ldots (9)$$

However, the unconditional mean is always the long run mean of the (Y_t) sequence that is equal to $\alpha/(1-\beta)$. The unconditional forecast error variance is:

$$E\left[(Y_{t+1} - \frac{\alpha}{1-\beta})^2\right] = \sigma^2/(1-\beta^2) \ldots\ldots\ldots\ldots\ldots (10)$$

Since $\sigma^2/(1-\beta^2) > 1$, the unconditional variance has greater than the conditional variance.

Testing for the ARCH Error

The Lagrange multiplier test is the test to measure the ARCH error in the model. In this methodology the main steps are:

1. Use OLS to estimate the most appropriate regression equation, and capture the error and developed the $\hat{\varepsilon}_t$
2. Regress these squared residuals on a constant and on the q lagged values of the fitted errors. So the regression equation is

$$\hat{\varepsilon}_t^2 = \alpha_0 + \alpha_1 \hat{\varepsilon}_{t-1}^2 + \alpha_2 \hat{\varepsilon}_{t-2}^2 + \alpha_3 \hat{\varepsilon}_{t-3}^2 + \cdots + \alpha_q \hat{\varepsilon}_{t-q}^2 \ldots\ldots\ldots\ldots (11)$$

If there are no ARCH effect then the estimated values of the α_1 through α_q should be zero. In the above equation obtain the coefficient of determination (R^2), and using the sample of T residual, then the test statistics is:

$$TR^2 \sim \chi^2 \ldots\ldots\ldots\ldots\ldots (12)$$

H_0: There are no ARCH Error;
H_1: There are ARCH Error.

Decision Rule: if the TR^2 is sufficiently large, rejection of the null hypothesis that is there is no ARCH effects. On the other hand, if the TR^2 sufficiently low, it is possible to conclude that there are no ARCH effects.

Generalized Autoregressive Conditional Heteroskedastic Model (GARCH)

Bollerslev (1986) extended Engle`s original work by developing a technique that allows the conditional variance to be an auto regressive moving average process. The error process be such that

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 7.306
H5-Index: 1, H5-Median: 1, H-Citations: 1

$$\varepsilon_t = z_t\sqrt{h_t} \quad \ldots\ldots\ldots\ldots. \quad (13)$$

Where $z_t^2 = 1$, and

$$h_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i \varepsilon_{t-i}^2 + \sum_{i=1}^{q} \gamma_i h_{t-i} \quad \ldots\ldots\ldots\ldots. \quad (14)$$

Since (ϵ_t) is white-noise process, the conditional and unconditional means of ϵ_t are equal to zero. Taking the expected value of ϵ_t it is easy to verify that

$$E\epsilon_t = E\epsilon_t\sqrt{h_t} = 0 \ldots\ldots\ldots. \quad (15)$$

And the conditional variance $E\epsilon^2 = h_t$. Thus, the conditional variance of ϵ is the auto regressive moving average process. Therefore, the GARCH model allows for both autoregressive and moving-average components in the heteroskedastic variance.

Threshold GARCH (TARCH) Model

In economics "bad" news seems to have a more pronounced effect on volatility than does "good" news. The threshold GARCH (TARCH) process is:

$$h_t = \alpha_0 + \alpha_1 \epsilon_{t-1}^2 + \gamma_1 \epsilon_{t-1}^2 d_{t-1} + \beta_1 h_{t-1} \ldots\ldots\ldots\ldots (16)$$

Where d_{t-1} is a dummy variable that is equal to one if $\epsilon_{t-1} < 0$ and equal to zero if $\epsilon_{t-1} > 0$.

Exponential Generalized Autoregressive Conditional Heteroskedastic (EGARCH) Model

EGARCH model also allows for the asymmetric effect of news. The necessary condition to apply the standard GRACH model that all the estimated coefficients are positive. Nelson (1991) proposed a specification that does not require non-negativity constraints. The EGARCH process is

$$\ln(h_t) = \alpha_0 + \alpha_1 \left(\frac{\epsilon_{t-1}}{\sqrt{h_{t-1}}}\right) + \gamma_1 \left|\epsilon_{t-1}/\sqrt{h_{t-1}}\right| + \beta_1 \ln(h_{t-1}) \ldots\ldots \quad \ldots. (17)$$

The EGARCH model allows for leverage effects. If $\frac{\epsilon_{t-1}}{\sqrt{h_{t-1}}}$ is positive, the effect of the shock on the log of the conditional variance is $\alpha_1 + \gamma_1$ and vice versa. After choosing the best model, serial correlation and heteroscedasticity is checked.

EMPIRICAL RESULTS

The empirical results are discuss in the present section. The results are:

Table-1: Exchange Rate of the Indian Rupee (Monthly Average and End-Month Rates) at Level: ADF Test Results

Variable	Model 1	Model 2	Model 3	Stationary/Non-stationary
SDR (Average)	1.914964 (0.9869)	-0.994285 (0.7560)	-3.092694 (0.1100)	Variables are non-stationary in all the three model
SDR (End-month)	2.015835 (0.9898)	-0.948784 (0.7716)	-2.953536 (0.1474)	
US $ (Average)	1.984435 (0.9890)	-0.011137 (0.9559)	-1.571121 (0.8021)	
US $ (End-month)	2.072091 (0.9911)	0.000466 (0.9570)	-1.517420 (0.8217)	
Pound Sterling (Average)	0.539183 (0.8320)	-1.415347 (0.5749)	-2.750101 (0.2174)	
Pound Sterling (End-month)	0.638641 (0.8537)	-1.387874 (0.5884)	-2.669069 (0.2504)	
Euro (Average)	1.186511 (0.9397)	-1.055169 (0.7338)	-2.855735 (0.1788)	
Euro (End-month)	1.047168 (0.9228)	-1.077958 (0.7252)	-3.080683 (0.1129)	

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 7.306
H5-Index: 1, H5-Median: 1, H-Citations: 1

Japanese Yen (Average)	1.010635 (0.9179)	-1.169347 (0.6883)	-2.844006 (0.1828)	
Japanese Yen (End-month)	1.157514 (0.9364)	-1.052205 (0.7350)	-2.561898 (0.2983)	

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () probability value
Sources: Authors Calculation

Table 1 presents the unit root test results of exchange rate of the Indian rupee (monthly average and end-month rates) at Level in the selected currency of the world for the period march 1992- July 2017. The ADF test result indicates that all the selected variables are non-stationary in all the three models (i.e. model 1- without intercept and without trend, model 2- with intercept and without trend, and model 3-with intercept plus trend).

Table-2: Exchange Rate of the Indian Rupee (Monthly Average and End-Month Rates) at First Difference: ADF Test Results

Variable	Model 1	Model 2	Model 3	Stationary/Non-stationary
SDR (Average)	-13.96966*** (0.0000)	-14.23260*** (0.0000)	-14.20816*** (0.0000)	Variables are stationary in all the three model but drift and trend coefficient are statistically insignificant in model-3. Thus, variables are stationary with drift components.
SDR (End-month)	-15.87185*** (0.0000)	-16.11487*** (0.0000)	-16.08735*** (0.0000)	
US $ (Average)	-12.96816*** (0.0000)	-13.19442*** (0.0000)	-13.21220*** (0.0000)	
US $ (End-month)	-15.68547*** (0.0000)	-15.89171*** (0.0000)	-15.89113*** (0.0000)	
Pound Sterling (Average)	-13.53429*** (0.0000)	-13.54992*** (0.0000)	-13.52697*** (0.0000)	
Pound Sterling (End-month)	16.78919*** (0.0000)	-16.80882*** (0.0000)	-16.78222*** (0.0000)	
Euro (Average)	-16.01830*** (0.0000)	-16.14078*** (0.0000)	-16.11688*** (0.0000)	
Euro (End-month)	-17.45406*** (0.0000)	-17.57973*** (0.0000)	-17.55415*** (0.0000)	
Japanese Yen (Average)	-16.11928*** (0.0000)	-16.20920*** (0.0000)	-16.18155*** (0.0000)	
Japanese Yen (End-month)	-16.01830*** (0.0000)	-16.14078*** (0.0000)	-16.11688*** (0.0000)	

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () probability value
Sources: Authors Calculation

Table 2 shows the ADF test result in all the three models for exchange rate of the Indian rupee (monthly average and end-month rates) at Level in the selected currency of the world for the period march 1992- July 2017. The ADF test results in model 1 (i.e. without intercept and without trend) and model 2 (i.e. with intercept and without trend) are highly significant at 1 percent level of significance. Further, the ADF test results for model 3 (i.e. with intercept plus trend) are significant at 1 percent level of significant but drift and coefficient of trend was found statistically insignificant then we cannot chose this model. Therefore, we chose model 2 (i.e. with drift and without trend) because the drift coefficient are statistically significant. We can infer that the selected variables are stationary at first difference with drift term [I (1)].

Table-3: Exchange Rate of the Indian Rupee (Monthly Average and End-Month Rates): (Mean Equation)

Variable	Coefficient
SDR (Average)	0.198885*** (2.679566)
SDR (End-month)	0.198252** (2.291218)
US $ (Average)	0.129289*** (2.804226)
US $ (End-month)	0.122632** (2.117289)
Pound Sterling (Average)	0.125209 (1.178083)
Pound Sterling (End-month)	0.118513 (0.935167)
Euro (Average)	0.192425* (1.716505)
Euro (End-month)	0.189807

	(1.574923)
Japanese Yen (Average)	0.143147* (1.818965)
Japanese Yen (End-month)	0.141815 (1.482480)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () probability value
Sources: Authors Calculation

Table 3 presents the estimated results for mean equation of exchange rate of the Indian rupee (monthly average and end-month rates) for the selected currency of the world for the period march 1992- July 2017. The result indicates that all the variables are statistically significant except Pound Sterling (Average), Pound Sterling (End-month) and Japanese Yen (End-month).

Table-4: Exchange Rate of the Indian Rupee (Monthly Average and End-Month Rates): ARCH LM Test Results

Variable	Lag	Observed ⁀²	Accept/Reject Null
SDR (Average)	At lag 1	0.039761 (0.8419)	Accept Null
	At lag 2	8.975649*** (0.0112)	Reject Null
SDR (End-month)	At lag 1	6.894537*** (0.0086)	Reject Null
	At lag 2	13.49988*** (0.0012)	Reject Null
US $ (Average)	At lag 1	15.61204*** (0.0001)	Reject Null
	At lag 2	33.05228*** (0.0000)	Reject Null
US $ (End-month)	At lag 1	19.70292*** (0.0000)	Reject Null
	At lag 2	31.91214*** (0.0000)	Reject Null
Pound Sterling (Average)	At lag 1	0.700656 (0.4026)	Null Accept
	At lag 2	3.910701 (0.1415)	Null Accept
Pound Sterling (End-month)	At lag 1	3.389757* (0.0656)	Reject Null
	At lag 2	10.38069*** (0.0056)	Reject Null
Euro (Average)	At lag 1	0.001993 (0.9644)	Null Accept
	At lag 2	0.002080 (0.9090)	Null Accept
Euro (End-month)	At lag 1	0.00000101 (0.9992)	Null Accept
	At lag 2	0.002325 (0.9988)	Null Accept
Japanese Yen (Average)	At lag 1	9.778498*** (0.0018)	Reject Null
	At lag 2	20.21140*** (0.0000)	Reject Null
Japanese Yen (End-month)	At lag 1	11.02890*** (0.0009)	Reject Null
	At lag 2	17.65660*** (0.0001)	Reject Null

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () probability value
Sources: Authors Calculation

Table 4 presents the ARCH-LM test results for the exchange rate of the Indian rupee (monthly average and end-month rates) for the selected currency of the world for the period march 1992- July 2017. The value of observed R^2 is highly significant at 1 percent level of significance that confirms the ARCH effect are present in exchange rate of the Indian rupee data series in India during the period of study i.e. we are able to reject null hypothesis (there is no ARCH effect). The presence of ARCH effect in data series, indicates that the data series of exchange rate of the Indian rupee are volatile for the period March 1992- July 2017.

Residual Plot of Mean Equation

Figure-1: SDR (Average)

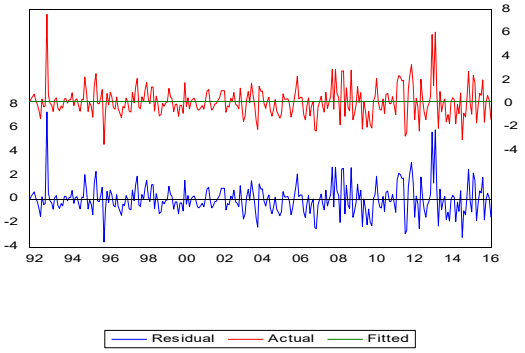


Figure-2: SDR (End-month)

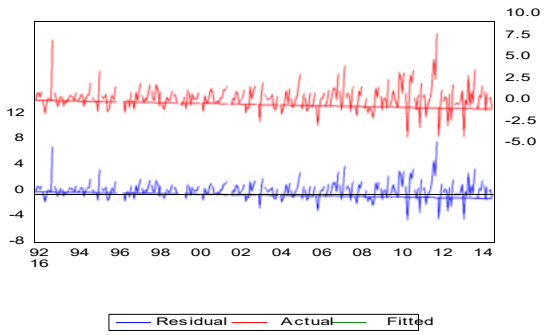


Figure-3: US $ (Average)

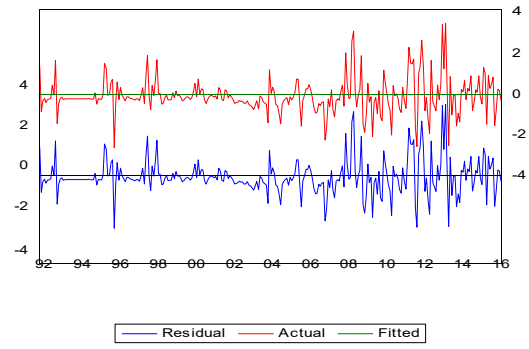


Figure-4: US $ (End-month)

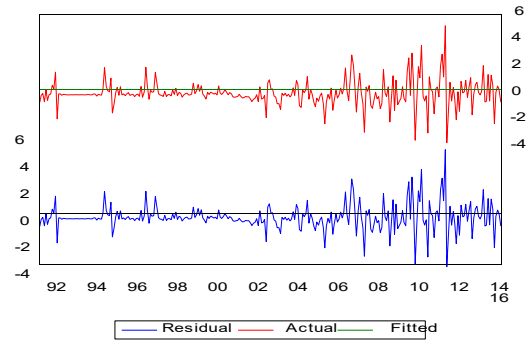


Figure-5: Pound Sterling (Average)

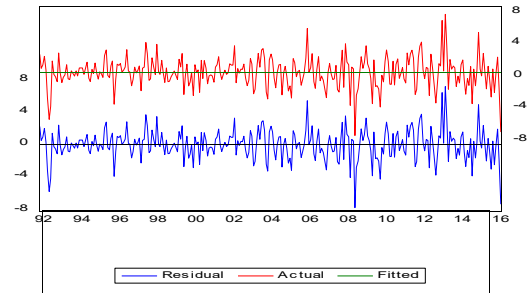


Figure-6: Pound Sterling (End-month)

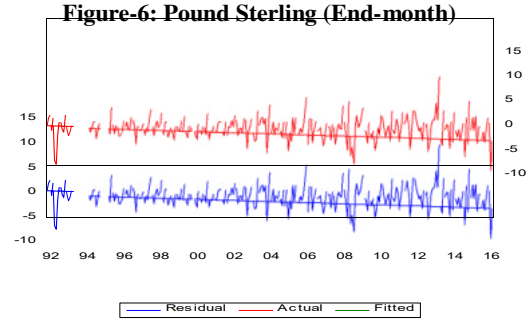


Figure-7: Euro (Average)

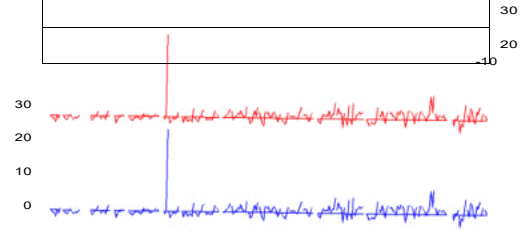
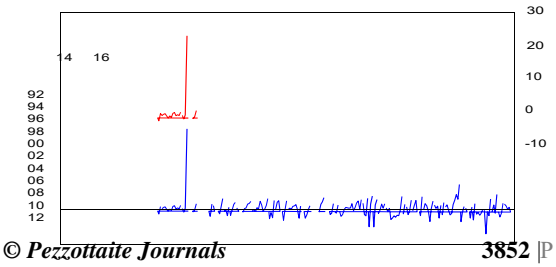
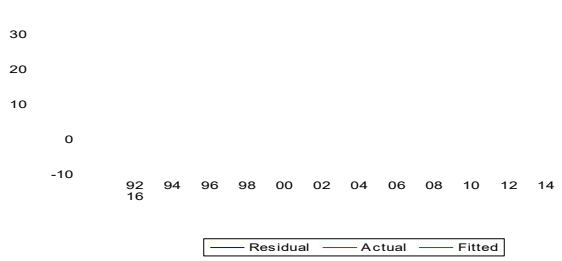


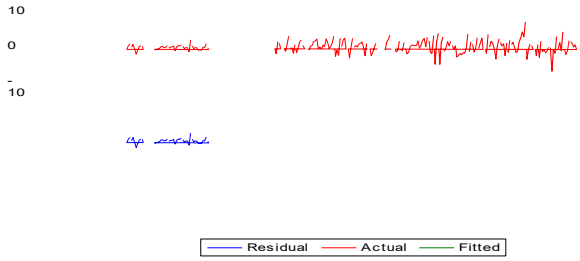
Figure-8: Euro (End-month)



PEZZOTTAITE JOURNALS

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 7.306
H5-Index: 1, H5-Median: 1, H-Citations: 1





Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 7.306
H5-Index: 1, H5-Median: 1, H-Citations: 1

Figure-9: Japanese Yen (Average)

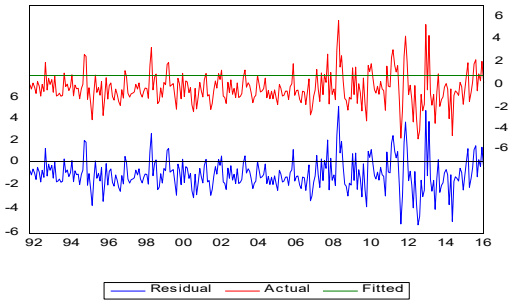
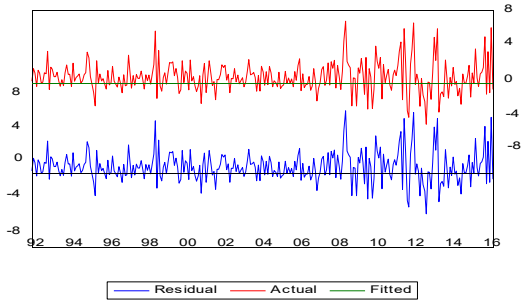


Figure-10: Japanese Yen (End-month)



Sources: Authors Compilation

The residual plot for the exchange rate of the Indian rupee (monthly average and end-month rates) are presents figure 1-10. The figure clearly indicates the presence of volatility in the exchange rate of the Indian rupee (monthly average and end-month rates) for the selected currency of the world for the period march 1992- July 2017. Therefore, once we observed the volatility in exchange rate series then proceeds for the ARCH family model and best fitted model by the model selection criterion [Akaike Information Criterion (AIC) and Schwarz Criterion (SBC)].

Table-5: SDR (Average): Model Selection

Model	AIC	SBC
ARCH	3.225375	3.313517
GARCH	3.297369	3.347736
TARCH	3.303724	3.366682
EGRACH	3.300210	3.363169

Sources: Authors Compilation

Table 5 shows the AIC and SBC values for the exchange rate in terms of SDR (Average) for the period March 1992- July 2017 of various ARCH family model. The lowest value of these criterions have found for ARCH (5) model. Thus, we estimate ARCH (5) model for exchange rate in terms of SDR (Average) for the period March 1992- July 2017.

Table-6: SDR (Average): ARCH (5) Model

Mean Equation	C	0.221557*** (3.967353)
Variance Equation	C	0.638599*** (4.881629)
	RESID(-1)^2	0.002390 (0.9560)
	RESID(-2)^2	0.108586*** (3.220187)
	RESID(-2)^2	-0.012458 (-0.271718)
	RESID(-2)^2	0.535737*** (5.642584)
	RESID(-2)^2	0.177136*** (2.441241)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () t-statistics
Sources: Authors Compilation

Table 6 presents the estimated results for ARCH (5) model for exchange rate in terms of SDR (Average) for the period March 1992- July 2017. The table presents the estimated results in terms of mean equation as well as variance equation. All the coefficients are statistically significant except first lag value of Residual Square. Thus, we can infer that the ARCH (5) model has best fitted model in case of the exchange rate in terms of SDR (Average) for the period March 1992- July 2017

Table-7: SDR (End-month): Model Selection

Model	AIC	SBC
ARCH	3.540919	3.629060
GARCH	3.537184	3.587551
TARCH	3.542990	3.605948
EGRACH	3.548701	3.611659

Sources: Authors Compilation

Table 7 shows the AIC and SBC values for the exchange rate in terms of SDR (End-month) for the period March 1992- July 2017 of various ARCH family model. The lowest value of these criterions have found for GARCH (1, 1) model. Thus, we estimate GARCH (1, 1) model for exchange rate in terms of SDR (Average) for the period March 1992- July 2017.

Table-8: SDR (End-month): GARCH (1, 1) Model

Mean Equation	C	0.200669** (2.263288)
Variance Equation	C	0.208916*** (4.102298)
	RESID(-1)^2	0.098500*** (3.789831)
	GARCH(-1)	0.807995*** (19.12145)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () t-statistics
Sources: Authors Compilation

Table 8 presents the estimated results for GARCH (1, 1) model for exchange rate in terms of SDR (End-month) for the period March 1992- July 2017. The table presents the estimated results in terms of mean equation as well as variance equation. All the coefficients are statistically significant. Thus, we can infer that the GARCH (1, 1) model has best fitted model in case of the exchange rate in terms of SDR (End-month) for the period March 1992- July 2017.

Table-9: US Dollar (Average): Model Selection

Model	AIC	SBC
ARCH	1.988426	2.076567
GARCH	2.027079	2.077445
TARCH	2.018763	2.081721
EGRACH	1.915940	1.978898

Sources: Authors Compilation

Table 9 shows the AIC and SBC values for the exchange rate in terms of US dollar (Average) for the period March 1992- July 2017 of various ARCH family model. The lowest value of these criterions have found for EGARCH model. Thus, we estimate EGARCH model for exchange rate in terms of US dollar (Average) for the period March 1992- July 2017.

Table-10: US Dollar (Average): EGARCH Model

Mean Equation	C	0.000192 (0.9922)
Variance Equation	C(2)	-0.862922*** (-14.99251)
	C(3)	1.030769*** (11.63324)
	C(4)	0.211599*** (3.715380)
	C(5)	0.821278*** (49.59406)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () t-statistics
Sources: Authors Compilation

Table 10 presents the estimated results of EGARCH model for exchange rate in terms of US dollar (Average) for the period March 1992- July 2017. The table presents the estimated results in terms of mean equation as well as variance equation. All the coefficients are statistically significant. Thus, we can infer that the EGARCH model has best fitted model in case of the exchange rate in terms of US dollar (Average) for the period March 1992- July 2017.

Table-11: USA (End-month): Model Selection

Model	AIC	SBC
ARCH	2.388112	2.476253
GARCH	2.394359	2.444725
TARCH	2.371854	2.434812
EGRACH	2.362049	2.425007

Sources: Authors Compilation

Table 11 shows the AIC and SBC values for the exchange rate in terms of US dollar (End-month) for the period March 1992- July 2017 of various ARCH family model. The lowest value of these criterions have found for EGARCH model. Thus, we estimate EGARCH model for exchange rate in terms of US dollar (End-month) for the period March 1992- July 2017.

Table-12: USA (End-month): EGARCH Model

Mean Equation	C	0.054406 (1.560022)
Variance Equation	C(2)	-0.010442 (-1.066106)
	C(3)	0.038717*** (3.880229)
	C(4)	-0.092515*** (-8.609332)
	C(5)	01.003458*** (413.2702)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () t-statistics
Sources: Authors Compilation

Table 12 presents the estimated results of EGARCH model for exchange rate in terms of US dollar (End-month) for the period March 1992- July 2017. The table presents the estimated results in terms of mean equation as well as variance equation. All the coefficients are statistically significant except first coefficient of variance equation. Thus, we can infer that the EGARCH model has best fitted model in case of the exchange rate in terms of US dollar (End-month) for the period March 1992- July 2017.

Table-13: Pound Sterling (Average): Model Selection

Model	AIC	SBC
ARCH	4.009259	4.097401
GARCH	4.008619	4.058986
TARCH	4.013074	4.076032
EGRACH	3.996446	4.059405

Sources: Authors Compilation

Table 13 shows the AIC and SBC values for the exchange rate in terms of Pound Sterling (Average) for the period March 1992- July 2017 of various ARCH family model. The lowest value of these criterions have found for EGARCH model. Thus, we estimate EGARCH model for exchange rate in terms of Pound Sterling (Average) for the period March 1992- July 2017.

Table-14: Pound Sterling (Average): EGARCH Model

Mean Equation	C	0.110532 (1.119567)
Variance Equation	C(2)	-0.107422** (-1.907449)
	C(3)	0.241909*** (2.406071)

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 7.306
H5-Index: 1, H5-Median: 1, H-Citations: 1

	C(4)	0.001077 (0.022904)
	C(5)	0.936201*** (21.00569)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () t-statistics
Sources: Authors Compilation

Table 14 presents the estimated results of EGARCH model for exchange rate in terms of Pound Sterling (Average) for the period March 1992- July 2017. The table presents the estimated results in terms of mean equation as well as variance equation. All the coefficients are statistically significant. Thus, we can infer that the EGARCH model has best fitted model in case of the exchange rate in terms of Pound Sterling (Average) for the period March 1992- July 2017.

Table-15: Pound Sterling (End-month): Model Selection

Model	AIC	SBC
ARCH	4.329817	4.417958
GARCH	4.329186	4.379553
TARCH	4.326464	4.389423
EGRACH	4.290370	4.353328

Sources: Authors Compilation

Table 15 shows the AIC and SBC values for the exchange rate in terms of Pound Sterling (End-month) for the period March 1992- July 2017 of various ARCH family model. The lowest value of these criterions have found for EGARCH model. Thus, we estimate EGARCH model for exchange rate in terms of Pound Sterling (End-month) for the period March 1992- July 2017.

Table-16: Pound Sterling (End-month): EGARCH Model

Mean Equation	C	0.235070** (1.918418)
Variance Equation	C(2)	-0.072602*** (-3.888514)
	C(3)	0.099575*** (4.387524)
	C(4)	0.093092*** (3.118430)
	C(5)	1.001264*** (136.1713)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () t-statistics
Sources: Authors Compilation

Table 16 presents the estimated results of EGARCH model for exchange rate in terms of Pound Sterling (End-month) for the period March 1992- July 2017. The table presents the estimated results in terms of mean equation as well as variance equation. All the coefficients are statistically significant. Thus, we can infer that the EGARCH model has best fitted model in case of the exchange rate in terms of Pound Sterling (End-month) for the period March 1992- July 2017.

Table-17: Euro (Average): Model Selection

Model	AIC	SBC
ARCH	4.214759	4.302901
GARCH	3.961837	4.012203
TARCH	3.814172	3.877130
EGRACH	4.075683	4.138641

Sources: Authors Compilation

Table 17 shows the AIC and SBC values for the exchange rate in terms of Euro (Average) for the period March 1992- July 2017 of various ARCH family model. The lowest value of these criterions have found for TARCH model. Thus, we estimate TARCH model for exchange rate in terms of Euro (Average) for the period March 1992- July 2017.

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 7.306
H5-Index: 1, H5-Median: 1, H-Citations: 1

Table-18: Euro (Average): TARCH Model

Mean Equation	C	0.011592 (0.709872)
Variance Equation	C	0.042275*** (32.62963)
	RESID(-1)^2	-0.006773*** (-15.23961)
	RESID(-1)^2*(RESID(-1)<0)	-0.048210*** (-6.034034)
	GARCH(-1)	1.009333*** (2803.282)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () t-statistics
Sources: Authors Compilation

Table 18 presents the estimated results of TARCH model for exchange rate in terms of Euro (Average) for the period March 1992- July 2017. The table presents the estimated results in terms of mean equation as well as variance equation. All the coefficients are statistically significant. Thus, we can infer that the TARCH model has best fitted model in case of the exchange rate in terms of Euro (Average) for the period March 1992- July 2017.

Table-19: Euro (End-month): Model Selection

Model	AIC	SBC
ARCH	4.337360	4.425502
GARCH	4.077852	4.128219
TARCH	3.952026	4.014984
EGRACH	4.220738	4.283696

Sources: Authors Compilation

Table 19 shows the AIC and SBC values for the exchange rate in terms of Euro (End-month) for the period March 1992- July 2017 of various ARCH family model. The lowest value of these criterions have found for TARCH model. Thus, we estimate TARCH model for exchange rate in terms of Euro (End-month) for the period March 1992- July 2017.

Table-20: Euro (End-month): TARCH Model

Mean Equation	C	0.051420*** (4.730171)
Variance Equation	C	0.025989*** (37.01170)
	RESID(-1)^2	-0.007938*** (-29.51999)
	RESID(-1)^2*(RESID(-1)<0)	-0.032620*** (-39.06095)
	GARCH(-1)	1.019098*** (14721.89)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () t-statistics
Sources: Authors Compilation

Table 20 presents the estimated results of TARCH model for exchange rate in terms of Euro (End-month) for the period March 1992- July 2017. The table presents the estimated results in terms of mean equation as well as variance equation. All the coefficients are statistically significant. Thus, we can infer that the TARCH model has best fitted model in case of the exchange rate in terms of Euro (End-month) for the period March 1992- July 2017.

Table-21: Japanese Yen (Average): Model Selection

Model	AIC	SBC
ARCH	3.278468	3.366609
GARCH	3.244404	3.294770

TARCH	3.248832	3.311790
EGRACH	3.270377	3.333336

Sources: Authors Compilation

Table 21 shows the AIC and SBC values for the exchange rate in terms of Japanese Yen (Average) for the period March 1992- July 2017 of various ARCH family model. The lowest value of these criterions have found for GARCH model. Thus, we estimate GARCH model for exchange rate in terms of Japanese Yen (Average) for the period March 1992- July 2017.

Table-22: Japanese Yen (Average): GARCH Model

Mean Equation	C	0.146578** (1.980829)
Variance Equation	C	0.071766*** (2.923099)
	RESID(-1)^2	0.112789*** (3.832001)
	GARCH(-1)	0.850825*** (23.18380)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () t-statistics
Sources: Authors Compilation

Table 22 presents the estimated results of GARCH model for exchange rate in terms of Japanese Yen (Average) for the period March 1992- July 2017. The table presents the estimated results in terms of mean equation as well as variance equation. All the coefficients are statistically significant. Thus, we can infer that the GARCH model has best fitted model in case of the exchange rate in terms of Japanese Yen (Average) for the period March 1992- July 2017.

Table-23: Japanese Yen (End-month): Model Selection

Model	AIC	SBC
ARCH	3.673873	3.762014
GARCH	3.644759	3.695126
TARCH	3.630192	3.693150
EGRACH	3.634317	3.697275

Sources: Authors Compilation

Table 23 shows the AIC and SBC values for the exchange rate in terms of Japanese Yen (End-month) for the period March 1992- July 2017 of various ARCH family model. The lowest value of these criterions have found for GARCH model. Thus, we estimate GARCH model for exchange rate in terms of Japanese Yen (End-month) for the period March 1992- July 2017.

Table-24: Japanese Yen: TARCH Model

Mean Equation	C	0.174038** (2.001450)
Variance Equation	C	0.071641*** (2.724502)
	RESID(-1)^2	0.139462*** (4.059896)
	RESID(-1)^2*(RESID(-1)<0)	-0.167803*** (-3.102075)
	GARCH(-1)	0.917480*** (27.76413)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () t-statistics
Sources: Authors Compilation

Table 22 presents the estimated results of GARCH model for exchange rate in terms of Japanese Yen (End-month) for the period March 1992- July 2017. The table presents the estimated results in terms of mean equation as well as variance equation. All the coefficients are statistically significant. Thus, we can infer that the GARCH model has best fitted model in case of the exchange rate in terms of Japanese Yen (End-month) for the period March 1992- July 2017.

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 7.306
H5-Index: 1, H5-Median: 1, H-Citations: 1

Table-25: Exchange Rate of the Indian Rupee (Monthly Average and End-Month Rates): Heteroskedasticity Test

Model	Observed ⁀⁀²	Accept/Reject Null
SDR (Average): ARCH (5)	0.073844 (0.7858)	Accept Null
SDR (End-month): GARCH (1, 1)	0.120878 (0.7281)	Accept Null
USA (Average): EGARCH	0.440632 (0.5068)	Accept Null
USA (End-month): EGARCH	9.692299 (0.0019)	Reject Null
Pound Sterling (Average): EGARCH	0.236413 (0.6268)	Accept Null
Pound Sterling (End-month): EGARCH	2.215039 (0.1367)	Accept Null
Euro (Average): TARCH	0.064376 (0.7997)	Accept Null
Euro (End-month): TARCH	0.059961 (0.8066)	Accept Null
Japanese Yen (Average): GARCH	5.419184 (0.0199)	Reject Null
Japanese Yen: TARCH	1.071625 (0.3006)	Accept Null

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; () Probability Value.
Sources: Authors Compilation

Table 25 depicts the test results for heteroskedasticity in various selected model for the exchange rate of the Indian rupee (monthly average and end-month rates) in the selected currency of the world for the period march 1992- July 2017. The test result indicates to accept the null hypothesis i.e. there is no heteroskedasticity, except USA (End-month) and Japanese Yen (Average) for EGARCH model. Thus, we can infer that all the selected model for the exchange rate of the Indian rupee (monthly average and end-month rates) in the selected currency of the world for the period march 1992- July 2017 are free the problem of heteroskedasticity, except USA (End-month) and Japanese Yen (Average) for EGARCH model.

Table-26: Exchange Rate of the Indian Rupee (Monthly Average and End-Month Rates): Autocorrelation Test

Lags	SDR (Average): ARCH (5)	SDR (End-month): GARCH (1, 1)	USA (Average): EGARCH	USA (End-month): EGARCH	Pound Sterling (Average): EGARCH
1	0.0748 (0.784)	0.1225 (0.726)	0.4459 (0.504)	9.8175*** (0.002)	0.2010 (0.654)
2	0.2314 (0.891)	0.1451 (0.930)	1.4066 (0.495)	9.8225*** (0.007)	0.2160 (0.898)
3	0.3147 (0.957)	0.3450 (0.951)	2.4155 (0.491)	10.126*** (0.018)	0.2167 (0.975)
4	0.8967 (0.925)	0.3456 (0.987	2.4771 (0.649)	10.294** (0.036)	0.2641 (0.992)
5	1.1375 (0.951)	0.4413 (0.994)	2.6909 (0.748)	10.839** (0.055)	1.2222 (0.943)
6	1.3415 (0.969)	0.7930 (0.992)	6.7967 (0.340)	11.190* (0.083)	1.3337 (0.970)
7	1.3422 (0.987)	0.8241 (0.997)	6.7972 (0.450)	11.388 (0.123)	1.3489 (0.987)
8	1.9570 (0.982)	1.0483 (0.998)	7.1343 (0.522)	11.697 (0.165)	1.4015 (0.994)
9	2.2492 (0.987)	1.1131 (0.999)	7.4220 (0.593)	13.311 (0.149)	2.2092 (0.988)
10	2.5821 (0.990)	1.1930 (1.000)	7.4246 (0.685)	15.941 (0.101)	2.2114 (0.994)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; Q-Statistics, () Probability Value.
Sources: Authors Compilation

Table 27: Exchange Rate of the Indian Rupee (Monthly Average and End-Month Rates): Autocorrelation Test

Lags	Pound Sterling (End-month): EGARCH	Euro (Average): TARCH	Euro (End-month): TARCH	Japanese Yen (Average): GARCH	Japanese Yen: TARCH
1	2.2431 (0.134)	0.0653 (0.798)	0.0608 (0.805)	5.4874*** (0.019)	1.0854 (0.298)
2	3.2435 (0.198)	0.1263 (0.939)	0.0608 (0.97)	6.5917** (0.037)	1.1334 (0.567)
3	3.2488 (0.355)	0.1440 (0.986)	0.1008 (0.992)	7.8055** (0.05)	1.54 (0.673)
4	3.6349 (0.458)	0.1697 (0.997)	0.1351 (0.998)	8.1743* (0.085)	1.5484 (0.818)
5	4.3356 (0.502)	0.2121 (0.999)	0.2319 (0.999)	8.2511 (0.143)	2.1185 (0.833)
6	4.8642 (0.561)	0.2705 (1.000)	0.2322 (1.000)	8.2641 (0.219)	2.2675 (0.894)
7	5.9814 (0.542)	0.2788 (1.000)	0.2523 (1.000)	8.3616 (0.302)	2.2829 (0.943)
8	6.0683 (0.640)	0.3283 (1.000)	0.322 (1.000)	8.7552 (0.363)	2.6792 (0.953)
9	6.5886 (0.680)	0.3512 (1.000)	0.4046 (1.000)	9.9915 (0.351)	2.7424 (0.974)
10	6.6152 (0.761)	0.3656 (1.000)	0.4195 (1.000)	10.151 (0.427)	3.2583 (0.975)

Note: ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level; Q-Statistics, () Probability Value.
Sources: Authors Compilation

Table 26 and table 27 present the test results of autocorrelation in various selected model for the exchange rate of the Indian rupee (monthly average and end-month rates) in the selected currency of the world for the period march 1992- July 2017. The test result indicates to accept the null hypothesis i.e. there is no autocorrelation, except USA (End-month) and Japanese Yen (Average) for EGARCH model. Thus, we can infer that all the selected model for the exchange rate of the Indian rupee (monthly average and end-month rates) in the selected currency of the world for the period march 1992- July 2017 are free the problem of autocorrelation, except USA (End-month) and Japanese Yen (Average) for EGARCH model.

CONCLUSION

The various ARCH family model for exchange rate of the Indian rupee (monthly average and end-month rates) vis-à-vis the SDR, US dollar, Pound Sterling, Euro and Japanese Yen for the period march 1992- July 2017. The unit root test results indicate that all the variables are non-stationary at level but it has become stationary at first difference. Further, the presence of ARCH effect in the exchange rate series is measured by the ARCH-LM test and residual plot. Once the ARCH effect is observed then we chose the best-fitted model on the basis of AIC and SBC. The mixed results have been found for exchange rate of the Indian rupee (monthly average and end-month rates) vis-à-vis the SDR, US dollar, Pound Sterling, Euro and Japanese Yen for the period march 1992- July 2017 [i.e. in case of SDR (average) we chose ARCH-05 model and SDR(End-month) GARCH model have chosen and so on]. The heteroskedasticity test result indicates that the selected model for the exchange rate of the Indian rupee (monthly average and end-month rates) in the selected currency of the world for the period march 1992- July 2017 are free the problem of heteroskedasticity, except USA (End-month) and Japanese Yen (Average) for EGARCH model. And, finally the autocorrelation test result indicates that the selected model for the exchange rate of the Indian rupee (monthly average and end-month rates) in the selected currency of the world for the period march 1992- July 2017 are free the problem of autocorrelation, except USA (End-month) and Japanese Yen (Average) for EGARCH model.

REFERENCES

Alam, Z., & Rahman, A. (2012). Modelling Volatility of the BDT / USD Exchange Rate with GARCH Model. ***International Journal of Economics and Finance,*** 4(11), 193 – 204.

Benavides, Guillermo. (2006, April). Volatility Forecasts for the Mexican Peso - U.S. Dollar Exchange Rate: An Empirical Analysis of GARCH. ***Option Implied and Composite Forecast Models, Banco de Mexico, Research Document 2006***, 1 – 39.

Bera, A. K., & Higgins, M. L. (1993). ARCH models: properties, estimation and testing. ***Journal of Economic Surveys,*** 7(4), 307-366.

Bollerslev, T. (1986). Generalized autoregressive conditional heteroscedasticity. ***Journal of Econometrics,*** 31, 307-327.

Campbell, J. Y., Lo, A. W., & MacKinlay, A. C. (1997). ***The Econometrics of Financial Markets.*** Princeton, New Jersey: Princeton University Press.

Dickey, D., & Fuller, W. (1981). Distribution of the estimators for autoregressive time series with a unit root. ***Econometrica Journal***, 49, 1057 – 1072.

Durnel, J. (2012). ***Applied Econometric Time Series, Arch Garch Modelling*** [Workshop]. Lund University. Retrieved on 11 January 2017 from http://www.academia.edu/1506454/Arch_Garch_Modelling

Enders, W. (1995). ***Applied Econometric Time Series***. New York: John Wiley and Sons.

Engle, R. F. (1982). Autoregressive conditional heteroscedasticity with estimates of the variance of U.K. inflation. ***Econometrica, 5***0, 987-1008.

Franses, P. H. (1998). ***Time Series Models for Business and Economic Forecasting.*** Cambridge University Press, UK.

Ghosh, Himadri, G., Sunil Kumar, & Prajneshu. (2005). Mixture nonlinear time series analysis: Modelling and forecasting. ***Calcutta Statistical Association Bulletin,*** 57, 95-108.

Glosten, L, Jagannathan, R., & Runkle, D. (1993). On the relationship between the Expected Value and the Volatility of the Nominal Ecess Return on Stocks. ***Journal of Finance***, 48, 1779–1802.

Hand Book of Statistics on Indian Economy (Various Issues). Reserve Bank of India.

Harvey, A. C. (1996). ***Forecasting, Structural Time Series Models and Kalman Filter.*** Cambridge: Cambridge University Press.

Musa, Y., Tasi'u, M., & Abubakar, B. (2014). Forecasting of Exchange Rate Volatility between Naira and US Dollar Using GARCH Models. ***International Journal of Academic Research in Business and Social Sciences,*** 4(7), 369–381. ISSN: 2222 – 6990.

Nelson, Daniel B. (1991). Conditional Heteroskedasticity in Asset Returns: A New Approach. ***Econometrica***, 59(2), 347 – 370.

Sayed Hossain. ***Hossain Academy***. Retrieved on 11 January 2017 from http://www.sayedhossain.com;

Spulbar, C., & Nitoi, M. (2012). The Impact Of Political And Economic News On The Euro / Ron Exchange Rate: A Garch Approach. ***Economy Series,*** 4, 52–58. University of Târgu Jiu: Annals of the Constantin Brâncuşi.

Teyssiere, G. (1995). Modelling Exchange Rates Volatility with Multivariate Long-Memory ARCH Processes. ***G.R.E.Q.A.M., Universite Aix-Marseille III***, 1 – 16.

Trenca, I., & Cociuba, M. (2011, July). Modeling Romanian Exchange Rate Evolution With Garch, Tgarch, Garch- In Mean Models. The Annals of the University of Oradea. ***Economic Sciences***, 1, 299 – 305.

Tsay, R. S. (2005). ***Analysis of Financial Time Series*** (2nd Edition). Canada: John Wiley & Sons, New Jersey.

Zakoian, J. M. (1994). Threshold Heteroskedastic Models. ***Journal of Economic Dynamics and Control,*** 18, 931 - 944.

Retrieved from https://link.springer.com/article/10.1007/s41996-018-0004-x

Retrieved from http://homework.boodom.com/q247019-10_Is_the_test_significant_at_the_5_level

Retrieved from https://www.researchgate.net/publication/323129673_An_Econometrics_Analysis_of_the_Determi...

Retrieved from https://www.indiastat.com/foreign-trade-data/12/exchange-rate/89/month-wise-exchange-rate/...

Retrieved from https://www.coursehero.com/file/p21lj2l/is-statistically-significant-at-the-5-level-with-a...

Retrieved from https://www.researchgate.net/publication/276266788_An_Econometric_Analysis_of_the_Relation...

Retrieved from https://www.coursehero.com/file/p21o1qa/Significant-at-the-5-percent-significance-level-Si...

Retrieved from https://www.coursehero.com/file/p3ul317e/Significant-at-the-1-percent-level-Significant-at...

Retrieved from https://www.coursehero.com/file/p33mqkdd/Significant-at-the-5-level-Significant-at-the-1-l...

Retrieved from https://www.coursehero.com/file/p1ssd9l/Significant-at-the-5-level-Significant-at-the-1-le...

Retrieved from https://www.coursehero.com/file/p46t3ad/significant-at-the-10-level-significant-at-the-5-l...

Retrieved from https://www.coursehero.com/file/p6dcdmv/Significance-at-the-5-level-Significance-at-the-1-...

Retrieved from https://www.coursehero.com/file/p4qrga4/Monthly-and-Annual-Averages-of-BSE-100-Base-1983-8...

Retrieved from https://www.researchgate.net/profile/Mobeen_Rehman2/publication/293779925_PAKISTAN_BUSINES...

Retrieved from https://www.sciencedirect.com/topics/social-sciences/exchange-rates

Retrieved from https://www.researchgate.net/publication/223618295_The_Relationship_Between_GARCH_and_Symm...

Retrieved from https://www.quora.com/What-is-the-difference-between-the-purchasing-power-parity-PPP-excha...

Retrieved from http://www.economicsdiscussion.net/exchange-rate/how-is-exchange-rate-determined-in-india/...

Retrieved from https://www.researchgate.net/publication/320911491_Equity_markets_volatility_dynamics_in_d...

Retrieved from https://www.researchgate.net/publication/332549492_Socio-political_Violence_in_Cambodia_Be...

Retrieved from http://www.sjsu.edu/faculty/watkins/exchange.htm

Retrieved from https://www.researchgate.net/publication/323127805_The_Issues_and_Implications_About_the_V...

Retrieved from https://en.wikipedia.org/wiki/Exchange_rate

Retrieved from https://www.hindawi.com/journals/ecri/2014/320949/

Retrieved from https://www.statista.com/statistics/247846/exchange-rate-of-the-euro-against-the-us-dollar...

Retrieved from https://en.wikipedia.org/wiki/Pound_sterling

Retrieved from http://www.elsevier.es/es-revista-contaduria-administracion-87-articulo-a-model-medium-ter...

Retrieved from https://gupea.ub.gu.se/bitstream/2077/56747/1/gupea_2077_56747_1.pdf

Retrieved from
https://www.researchgate.net/publication/330056491_THE_IMPACT_OF_FOREIGN_DIRECT_INVESTMENT...

Retrieved from https://www.coursehero.com/file/p7q8ttl/Table-1-Representative-Exchange-Rates-What-the-Rat...

Retrieved from https://www.quora.com/What-is-rupee-dollar%E2%80%99s-exchange-rate-in-terms-of-purchasing-...

Retrieved from https://www.surveysystem.com/signif.htm

Retrieved from https://www.researchgate.net/publication/240299269_Previsao_de_precos_futuros_de_Commoditi...

Retrieved from http://www.lahoreschoolofeconomics.edu.pk/businessjournals/V1issue1/05%20Musaddiq%20ED.pdf

Retrieved from https://alpari.com/en/beginner/articles/7-factors-influence-exchange-rates/

Retrieved from https://www.quora.com/How-do-I-interpret-the-results-in-an-augmented-Dickey-Fuller-test

Retrieved from https://www.stern.nyu.edu/rengle/GARCH101.PDF

Retrieved from https://www.researchgate.net/publication/301289173_THE_RELATIONSHIP_BETWEEN_FOREIGN_EXCHAN...

Retrieved from https://www.researchgate.net/publication/323751405_Volatility_estimation_using_a_rational_...

Retrieved from https://www.researchgate.net/profile/Bruno_Sitzia/publication/24116093_Nonlinearities_in_E...

Retrieved from http://shodhganga.inflibnet.ac.in/bitstream/10603/8509/14/14_chapter%205.pdf

Retrieved from http://faculty.washington.edu/ezivot/econ589/////Backtesting_VaR_Models.pdf

Retrieved from http://mme2012.opf.slu.cz/proceedings/pdf/039_Ghiba.pdf

Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/j.1468-5876.2011.00548.x/full?dmmsmid=70966&...

Retrieved from https://www.quora.com/What-are-stationary-and-non-stationary-series

Retrieved from https://coinmill.com/EUR_JPY.html

Retrieved from https://www.rbi.org.in/scripts/FS_Overview.aspx?fn=5

Retrieved from https://eprints.usq.edu.au/9227/2/Sarker_Alam_ASS_2010_PV.pdf

Retrieved from https://www.quora.com/How-much-has-GBP-USD-been-affected-by-Brexit-in-terms-of-exchange-ra...

Retrieved from https://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=12346

Retrieved from http://www.economicswebinstitute.org/glossary/exchrate.htm

Retrieved from http://iosrjournals.org/iosr-jbm/papers/Vol19-issue7/Version-1/A1907010108.pdf

Retrieved from http://en.wikipedia.org/wiki/Foreign_Exchange_Management_Act

Retrieved from https://en.wikipedia.org/wiki/Foreign_Exchange_Regulation_Act

Retrieved from http://en.wikipedia.org/wiki/Foreign_Exchange_Regulation_Act

Retrieved from https://apps.dtic.mil/dtic/tr/fulltext/u2/a277382.pdf

Retrieved from https://bookdown.org/ccolonescu/RPoE4/time-varying-volatility-and-arch-models.html

Retrieved from https://www.statisticshowto.datasciencecentral.com/unit-root/

Retrieved from http://isss.ind.in/pdf/2016/v2/18.pdf

Retrieved from https://www.cfainstitute.org/membership/professional-development/refresher-readings/2019/c...

Retrieved from https://www.quora.com/What-is-Foreign-Exchange

Retrieved from http://www.igidr.ac.in/conf/money1/mfc-12/A%20GARCH%20Analysis%20of%20Exchange%20Rate%20Vo...

Retrieved from https://www.coursehero.com/file/p6mnlbk/data-series-ie-the-mps-data-are-non-stationary-at-...

Retrieved from http://www.ijbssnet.com/journals/Vol_3_No_6_Special_Issue_March_2012/23.pdf

Retrieved from https://www.quora.com/Does-Chase-Bank-exchange-foreign-currency-If-so-are-their-rates-comp...

Retrieved from http://www.simplydecoded.com/2015/08/07/nominal-and-real-effective-exchange-rate-explained...

Retrieved from https://www.definitions.net/definition/eXchange%20Rate

Retrieved from https://en.wikipedia.org/wiki/Fixed_exchange_rate

Retrieved from https://www.projectguru.in/publications/impact-fdi-inflows-rate-inflation-india/

Retrieved from https://paperity.org/p/76927566/the-effect-of-electronic-trading-on-market-volatility-and-...

Retrieved from http://www.oalib.com/paper/2593595

Retrieved from https://stats.stackexchange.com/questions/55805/how-do-you-interpret-results-from-unit-roo...

Retrieved from https://ttu-ir.tdl.org/ttu-ir/bitstream/handle/2346/ETD-TTU-2011-05-1479/TERCERO-DISSERTAT...

Retrieved from https://www.researchgate.net/post/How_to_Proceed_with_the_following_results_of_ADF_Test

Retrieved from https://smedia2.intoday.in/businesstoday/1.0.2/resources/images/budget/2017/speech/Budget2...

Retrieved from https://gwnzone.com/a-line-chart-of-exchange-rate-of-china-for-the-period-2001-2017/

Retrieved from https://papers.ssrn.com/sol3/Delivery.cfm?abstractid=691885

Retrieved from https://www.worldcat.org/title/pay-dirt-the-business-of-professional-team-sports/oclc/9546...

Retrieved from https://www.coursehero.com/file/p80qkg/8-Table-1-The-Exchange-Rate-of-the-Chinese-Yuan-aga...

Retrieved from https://econpapers.repec.org/RePEc:ora:journl:v:1:y:2011:i:special:p:299-305

Retrieved from https://archive.org/stream/pubmed-PMC3812634/PMC3812634-s130810908_djvu.txt

Retrieved from https://researchrundowns.com/quantitative-methods/significance-testing/

Retrieved from http://currencyinformation.org/history-of-the-japanese-yen

Retrieved from https://www.wisegeek.com/what-is-exchange-rate-volatility.htm

Retrieved from https://www.coursehero.com/file/p4384n/Conditional-variance-The-variance-of-the-conditiona...

Retrieved from https://www.researchgate.net/publication/256067644_Persistence_and_Kurtosis_in_GARCH_and_S...

Retrieved from https://www.researchgate.net/publication/265499577_Self_Exciting_Threshold_Autoregressive_...

Retrieved from https://academic.oup.com/jsh/article/32/2/429/979895

Retrieved from https://www.researchgate.net/post/There_is_no_ARCH_effect_in_my_data_can_i_go_for_GARCH_te...

Retrieved from https://en.wikipedia.org/wiki/Tim_Bollerslev

Retrieved from https://open.library.ubc.ca/collections/ubctheses/24/items/1.0073473

Retrieved from https://fxssi.com/top-10-of-the-weakest-world-currencies-in-2016/

Retrieved from https://en.wikipedia.org/wiki/Conditional_variance

Retrieved from https://vlab.stern.nyu.edu/doc/4?topic=mdls

Retrieved from http://econ.ucsb.edu/~doug/researchpapers/Purchasing%20Power%20Parity%20Unit%20Roots%20and...

Retrieved from https://www.investopedia.com/articles/trading/07/stationary.asp

Retrieved from http://sfb649.wiwi.hu-berlin.de/fedc_homepage/xplore/tutorials/sfehtmlnode67.html

Retrieved from https://library.villanova.edu/Find/Record/1652902/Cite

Retrieved from https://www.mathworks.com/help/econ/egarch.html

Retrieved from https://archive.org/stream/dailycolonist57y217uvic/dailycolonist57y217uvic_djvu.txt

Retrieved from https://www.investopedia.com/terms/f/foreign-exchange.asp

Retrieved from http://eujournal.org/index.php/esj/article/view/5659

Retrieved from http://www.freepatentsonline.com/7027848.html

Retrieved from https://quant.stackexchange.com/questions/8251/how-to-calculate-the-conditional-variance-o...

Retrieved from https://www.researchgate.net/post/heteroscedasticity_and_ARCH_effect_in_ARIMA_SARIMA

Retrieved from https://stats.stackexchange.com/questions/234291/armaegarch-model-with-negative-omega-para...

Retrieved from https://epdf.tips/applications-of-soft-computing-from-theory-to-praxis.html

Retrieved from https://www.scirp.org/(S(vtj3fa45qm1ean45vvffcz55))/reference/ReferencesPapers.aspx?Refere...

Retrieved from https://personal.eur.nl/hkvandijk/PDF/Schotman_and_Van_Dijk_1991_JoE_bayes_unit_roots.pdf

Retrieved from https://stats.stackexchange.com/questions/3984/understanding-aic-and-schwarz-criterion

Retrieved from http://www.ams.sunysb.edu/~zhu/ams586/UnitRoot_ADF.pdf

Retrieved from https://mpra.ub.uni-muenchen.de/4820/index.html

Retrieved from https://www.researchgate.net/profile/Rasajit_Bera

Retrieved from http://www.public.asu.edu/~kroel/www500/hypothesis.pdf

Retrieved from https://www.researchgate.net/profile/Hasan_Dogan5/publication/294578516_Evaluation_as_Econ...

Retrieved from https://www.investopedia.com/terms/r/reer.asp

Retrieved from http://www.economics-ejournal.org/economics/journalarticles/2007-12/references/RePEc-eee-d...

Retrieved from https://www.wikihow.com/Calculate-Exchange-Rate

Retrieved from http://www.globalization101.org/currencies-and-exchange-rates/

Retrieved from https://rd.springer.com/chapter/10.1007/978-3-319-32862-1_17

Retrieved from http://folk.uio.no/rnymoen/Ectsem_oilrig2.pdf

Retrieved from http://www.oalib.com/references/19834522

Retrieved from https://stats.stackexchange.com/a/37929

Retrieved from https://stats.stackexchange.com/questions/37912/how-to-determine-which-variables-are-stati...

Retrieved from https://stats.stackexchange.com/a/37971

Retrieved from https://www.econometrics-with-r.org/7-3-joint-hypothesis-testing-using-the-f-statistic.htm...

Retrieved from https://www.ijmttjournal.org/archive/ijmtt-v26p513

Retrieved from http://sfb649.wiwi.hu-berlin.de/fedc_homepage/xplore/tutorials/xegbohtmlnode50.html

Retrieved from https://v8doc.sas.com/sashtml/ets/chap8/sect22.htm

Retrieved from https://quant.stackexchange.com/questions/tagged/garch?sort=newest&page=2

Retrieved from https://searchworks.stanford.edu/view/12451395

Retrieved from https://www.exchangerates.org.uk/GBP-USD-13_04_2018-exchange-rate-history.html

Retrieved from https://en.wikipedia.org/wiki/Akaike_information_criterion

Retrieved from https://remington-work.blogspot.com/2010/08/good-intrduction-to-garch-and-ewma.html

Retrieved from https://stats.stackexchange.com/questions/266700/no-

Retrieved from https://stats.stackexchange.com/questions/266700/no-arch-effect-in-the-univariate-case-but...

Retrieved from http://en.wikipedia.org/wiki/Japanese_yen

Retrieved from https://www.currency-calc.com/EUR_JPY

Retrieved from https://www.probabilitycourse.com/chapter5/5_1_5_conditional_expectation.php

Retrieved from https://www.coursehero.com/file/p1a35noc/Step-3-It-is-necessary-to-specify-both-the-Mean-E...

Retrieved from https://globaljournals.org/GJSFR_Volume17/4-Comparison-of-Different-Volatility.pdf

Retrieved from https://econpapers.repec.org/RePEc:eee:dyncon:v:18:y:1994:i:5:p:931-955

Retrieved from https://datascience.stackexchange.com/a/14620

Retrieved from https://www.imf.org/en/About

Retrieved from https://en.wikipedia.org/wiki/British_currency_in_the_Middle_East

Retrieved from https://www.quora.com/Is-there-a-test-you-could-do-to-map-the-non-working-areas-of-the-ret...

Retrieved from https://www.researchgate.net/post/What_is_the_difference_between_GARCH_and_ARCH

Retrieved from https://www.researchgate.net/post/Is_EGARCH_model_is_best_for_time_series_data_stock_marke...

Retrieved from https://www.coursehero.com/file/p8spdg/Y-t-I1-If-the-second-difference-of-Y-t-is-stationar...

Retrieved from http://www.yourarticlelibrary.com/macro-economics/balance-of-payment/main-types-of-foreign...

Retrieved from https://issuu.com/alexanderdecker/docs/an_empirical_study_on_the_relations/5

*****

PEZZOTTAITE JOURNALS

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 8.924
H5-Index: 1, H5-Median: 1, H-Citations: 1

LIKELIHOOD OF CONFUSION IN TRADEMARK LAW OF INDIA AND US: A COMPARATIVE STUDY

C. V. Madhusudhanan[4] Dr. V. Balachandran[5]

ABSTRACT

A trademark is a vehicle of goodwill and brand loyalty and occupies the mind space of the consumer's worldwide, thereby making it more valuable than its present earning capability. It is a carrier for quality and acts as a great advertising vehicle. A trademark permeates into the mind-set of the consumer in such a manner that the cost of the goods or services represented by a trademark sometimes has no relevance to the physical composition or value of such goods or services. The basic characteristic ability of a trademark is to be distinctive in the market place so that it helps it to be identifiable without any confusion and hence provide better visibility of goods and services. Even the capability of graphical representation for a trademark, which at present is a sine qua non in trademark registration, is losing relevance due to new genre of trademark like sound marks, smell marks, feel marks etc. The primary function of trademark is twofold: The first is to distinguish goods or services of one source from that of another and second is to indicate the source of origin of goods or services. The distinguishing feature separates trademark from a mark and makes it a recognizable intellectual property. However, when the distinctive or distinguishing feature of a trademark is challenged due to infringement by an identical or similar trademark, there arises the concept of confusion and deception. When a junior trademark in the market place challenges the distinctiveness of a senior trademark, there arises confusion or a likelihood of confusion in the minds of the consumer as regards the goods or services represented by each of those trademarks. When the confusion leads to make a consumer believe that such a junior trademark is from the same stable as the senior trademark, there arises deception as to the source. This article examines the legal position under the respective trademark law in India and in the US, that provides protection to a registered proprietor of a trademark subject to such challenge in the market place.

KEYWORDS

Identical, Similar, Confusion, Deception, Protection, Intellectual Property, Distinctiveness, Infringement etc.

INTRODUCTION

Trade mark performs dual role in commerce. One is that they act as a source indicator in respect of goods or services which they represent. The other is that they distinguish goods or services of one source from that of the other. As the rule goes, every trade mark is a mark, but every mark need not be a trade mark. The basic characteristic ability of a trade mark is to be distinctive in the market place so that it helps it to be identifiable without any confusion and hence provide better visibility of goods and services. Even the capability of graphical representation for a trade mark, which at present is a sine qua non in trade mark registration, is losing relevance due to new genre of trade mark like sound marks, smell marks, feel marks etc. Hence what will remain forever as a characteristic uncompromising feature of a trade mark, is its ability to be distinctive.

Concept of Likelihood of Confusion in India

As a Ground for Rejection of Application for Registration of Trademark

While distinctive feature acts as a hallmark for recognition for a trade mark, the very feature will get challenged by a similar or identical looking trade mark or a colourable imitation of the same in the market place. Section 11(1) of the Trademarks Act, 1999 (the Act) states that a trade mark shall be registered only if it is not expected to cause confusion in the eyes and minds of the general public. That is, the test under the said Section is to determine the feasibility of a trade mark that is subject to registration and its ability to create confusion in the minds of the public, upon its registration. The likelihood to cause confusion be said to exist if the trade mark can be associated with earlier trade mark due to it being:

(a) Identical with the earlier trade mark even though the goods or services it represents may be just similar (and not identical),
(b) Similar to an earlier trade mark even though the goods or services it represents are either similar or identical.

[4]Research Scholar, Department of Corporate Secretaryship, School of Management, Alagappa University, Tamil Nadu, India, madhu@ksrandco.in
[5]Special Officer (Planning & Development) and Professor, Alagappa University, Tamil Nadu, India, drvbchand@gmail.com

The Supreme Court in National Sewing Thread Co. Ltd., Chidambaram vs. James Chadwick and Bros Ltd. AIR 1953 SC 357 observed as under:

"The principles of law applicable to such cases are well-settled. The burden of proving that the trademark which a person seeks to register is not likely to deceive or to cause confusion is upon the applicant. It is for him to satisfy the Registrar that his trade mark does not fall within the prohibition of Section 8 and therefore, it should be registered. Moreover in deciding whether a particular trade mark is likely to deceive or cause confusion that duty is not discharged by arriving at the result by merely comparing it with the trade mark which is already registered and whose proprietor is offering opposition to the registration of the mark. The real question to decide in such cases is to see as to how a purchaser, who must be looked upon as an average man of ordinary intelligence, would react to a particular trade mark, what association he would form by looking at the trade mark, and in what respect he would connect the trade mark with the goods which he would be purchasing."

It should be noted that the actual confusion is not the test, but the ability to confuse is what is tested. However this test excludes circumstances where a honest and concurrent use of a trade mark by a proprietor (though junior to the earlier registered trade mark) or any other special circumstances as the Registrar may consider to register a trade mark, despite the existence of the above ground (Section 12).

As a Ground in Infringement of Trade Mark

Section 28(1) provides that a registered proprietor gets two rights upon registration. One is the right to use the mark exclusively and the other is the right to sue for infringement. The Act does not allow infringement proceedings against unregistered trade mark (Section 27). Section 29 provides for various grounds on which action against infringement of a registered trade mark can be initiated. Section 29(1) provides that a registered trade mark is said to be infringed, if a person other than the registered proprietor or a permitted user, uses the trade mark in relation to goods or services (in respect of which a trade mark is registered) so as to render the use of the mark as being used as a trade mark. Such use by an unregistered proprietor should be such that the unregistered trade mark is deceptively similar to the registered trade mark. Hence under Section 29(1) the mere similarity or identical nature of an unregistered trade mark with a registered trade mark will render such use by the unregistered trade mark liable to be sued for infringement. The term "deceptively similar" is defined to mean a mark so nearly resembling the other mark as to be likely to deceive or cause confusion.

The concept of deception is the hallmark of passing off proceedings whereas the concept of likelihood to confuse the public is basis of infringement proceedings. In Parker Knoll Ltd. v. Knoll International Ltd., 1862 **RPC** 265 at Page 274, Lord Denning explained the words "to deceive" and the phrase "to cause confusion" as follows, which was stated with acceptance the Supreme Court in the case of F. Hoffimann-La Roche and Co. Ltd., v. Geoffrey Manners and Co. Private Ltd., AIR 1970 SC 2062 (V 57 C 439):

"*Secondly, to 'deceive' is one thing. To cause confusion' is another. The difference is this: When you deceive a man, you tell him a lie. You make a false representation to him and thereby cause him to believe a thing to be true which is false. You may not do it knowingly, or intentionally, but still you do it, and so you deceive him. But you may cause confusion without telling him or without making any false representation to him. You may indeed tell him the truth, the whole truth and nothing but the truth, but still you may cause confusion in his mind, not by any fault of yours, but because he has not the knowledge or ability to distinguish it from the other pieces of truth known to him or because he may not even take the trouble to do so."*

Hence deception is said to always involve a guilty intent, while creation of a confusion in the public need not have such an intention. Section 29(2) provides a combination of instances of identical nature or similarity of the infringing mark vis-a-vis the registered trade mark and the goods or services which it represents so as to ascertain whether the use of such unregistered trade mark will cause confusion in the eyes and minds of the public. A registered trade mark is infringed by a person who, not being the registered proprietor or a permitted user, uses in course of trade, a mark which because of:

Its identity with the registered trade mark and the similarity of the goods or services covered by such registered trade mark; or
Its similarity to the registered trade mark and the identity or similarity of the goods or services covered by such registered trade mark; or
Its identity with the registered trade mark and the identity of the goods or services covered by such registered trade mark
Is likely to cause confusion on the part of the public, or which is likely to have an association with the registered trade mark.

Section 29(3) declares that the court shall presume *likelihood of confusion* if any case falls under Section 29(2)(c) while dealing with infringement proceedings of a registered trade mark.

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 8.924
H5-Index: 1, H5-Median: 1, H-Citations: 1

The Bombay High Court in ***Ajanta Pharma vs. Theon Pharmaceuticals & Another (India Kanoon.org/doc/149703451)*** encountered the argument of defence against infringement of a registered trade mark as that the provisions of Section 29(1) is 'mark' centric while provisions of Section 29(2) is 'effect centric'. To state plainly, under Section 29(1) if a registered proprietor of a trade mark proves that the infringing mark is identical or deceptively similar with its registered trade mark then the offence of infringement is proved. Whereas under Section 29(2) not only the registered proprietor should prove that the infringing trade mark is similar or identical, as the case may be, such similarity or identical nature of the infringing mark should have the ability to cause public confusion. Further the defence went on state that the presentation of the effect of likelihood of confusion gets proven when an infringing mark is not only identical with the registered trade mark but also identical in respect of goods or services covered by such registered trade mark.

However a deeper reading of Section 29(1) will reveal that the provision is not just mark centric. The provision provides for a comparative analysis of use of the infringing trade mark vis-a-vis the goods or services in respect of which a registered trade mark is registered such usage have to be in the course of trade. Hence a combination of comparison of trade mark, its usage in the course of trade and the similarity or identical nature of the goods or services in respect of which the infringing mark is used are essential points to nail an infringement case. Further Section 29(2) provides that the concept of likelihood of public confusion stands proved once the infringing trade mark and the registered trade mark are identical **and** there is identity of nature of goods or services represented by the respective trade mark.

On an analysis of provisions of Section 29(1) and (2), the following summation can be reached:

> Under Section 29(1) two permutations are provided: One is use in the course of trade by an identical infringing trade mark (vis-a-vis the registered trade mark) as regards identical goods or services which might render the infringing mark to be taken as registered trade mark. The second is that the use in the course of trade by a deceptively similar trade mark in respect of identical or similar goods or services which might render the infringing mark to be taken as registered trade mark. In both the permutations the use of the infringing trade mark in the course of trade is essential.
>
> Under Section 29(2) a wider permutation of conditions of
> Identical trade mark vis-a-vis similar goods or services,
> Similar trade mark vis-à-vis identical goods or services,
> Similar trade mark vis-a-vis similar goods or services,
> Identical trade mark vis-a-vis similar goods or services.
> in such a manner that use of the infringing mark in the course of trade is likely to cause public confusion or likely to have an association with the registered trade mark.

Hence it can be understood that the combination of permutations on the identical or similar nature of the infringing trade mark vis-a-vis the identical or similar nature of goods as regards the registered trade mark widens the ambit of coverage of factors which can lead to public confusion. The burden of proving whether a competing mark is likely to cause confusion amongst the public is on the registered proprietor who sues.

Thus the position of the Act under Section 11(1) and Section 29(1) and (2) as regards the ability of mark to cause public confusion and not to prove actual confusion. The following observation by the Supreme Court in Corn Products Refining Company vs. Shangrila Food Products Limited, 1960(1) SCR 968 is worth noting:

> *"It is well known that the question whether the two marks are likely to give rise to confusion or not is a question of first impression. It is for the court to decide that question. English cases proceeding on the English way of pronouncing an English word by Englishmen, which it may be stated is not always the same, may not be of much assistance in our country in deciding questions of phonetic similarity. It cannot be overlooked that the word is an English word which to the mass of the Indian people is a foreign word. It is well recognised that in deciding a question of similarity between two marks, the marks have to be considered as a whole."*

Parker, J. in Re Pianotist Co. (1906) 23 RPC 774 observed while considering the factors of deceptive similarity of a trade mark and its ability to cause public confusion:

> *"You must judge them, both by their look and by their sound. You must consider the goods to which they are to be applied. You must consider the nature and kind of customer who would be likely to buy those goods. In fact you must consider all the surrounding circumstances; and you must further consider what is likely to happen if each of those trademarks is used in a normal way as a trade mark for the goods of the respective owners of the marks. For deceptive resemblance two important questions are: (1) who are the*

> *persons whom the resemblance must be likely to deceive or confuse, and (2) what rules of comparison are to be adopted in judging whether such resemblance exists. As to confusion, it is perhaps an appropriate description of the state of mind of a customer who, on seeing a mark thinks that it differs from the mark on goods which he has previously bought, but is doubtful whether that impression is not due to imperfect recollection."*

Concept of Likelihood of Confusion in the US

The Lanham Act or the Trademark Act, 1946 (the US Act) under Section 1 (Title-1) (15 U.S.C. Section 1051) provides that the applicant for registration of a trade mark has to state inter alia that to his best of knowledge and belief that no other person has right to the mark in commerce either identical or resembling thereto or when used is likely to cause confusion or cause to mistake or to deceive except on certain grounds relating to concurrent use.

The US Act under Section 2 (Title-1) (15 U.S.C. Section 1052) provides that no mark can be registered inter alia if such mark so resembles a registered mark or a mark previously used in the US by another but not abandoned, as to be likely when used on or in connection with the goods of the applicant to cause confusion or to cause mistake or to deceive unless such use is permitted as per the grounds provided therein by the Director of USPTO.

The US Act under Section 16 (Title-1) (15 U.S.C. Section 1066) provides for interference proceedings inter alia if it could be shown to the Director of USPTO that the mark subject to registration resembles a mark previously registered by another, or in respect of which an application for registration is pending, as to be likely when used on or in connection with the goods or services of the applicant to cause confusion or mistake or to deceive.

The US Act further provides for a cause of action on the ground of likelihood of confusion under Section 32 (Title VI) (15 U.S.C. Section 1114) against a person who

(a) Uses in commerce any reproduction, counterfeit, copy or colourable imitation of a registered trade mark in connection with the sale, offering for sale, distribution, or advertising of any goods or services on or in connection with which such use is likely to cause confusion, or to cause mistake or, to deceive; or
(b) Reproduce, counterfeit, copy or colourably imitate a registered mark and apply such reproduction, counterfeit, copy or colourable imitation to labels, signs, prints, packages, wrappers, receptacles or advertisements intended to be sued in commerce upon or in connection with which such use is likely to cause confusion, or to cause mistake, or to deceive.

It is further provided that under (b) above the registrant shall not be entitled to recover profits or damages unless the acts have been committed with knowledge that such imitation is intended to be used to cause confusion, or to cause mistake, or to deceive. Thereafter the Section proceeds to describe the nature of injunctive relief, monetary and other reliefs that can be claimed by the registrant.

The term "colourable imitation' is defined to include a mark which resembles a registered mark as likely to cause confusion or mistake or to deceive. Hence under Section 35 of the US Act, to prove infringement of a mark a claimant must demonstrate the following:

a) That it owns a valid mark mark, i.e., the mark, registered or not, is entitled to protection;
b) That the defendant is using the mark, or a confusingly similar mark, in commerce without permission;
c) That the defendant's use of the mark in commerce is likely to cause confusion, mistake or deception as to who actually is the source of either the plaintiff's or the defendant's products;

Further the US Act provides under Section 43 (Title VIII) (U.S.C. Section 1125) dealing with false designations or origin, false descriptions and dilution of trade mark provides for a civil action against any person causing inter alia use of a trade mark in connection with any goods or services in commerce, any word, term, name, symbol, or device, or any combination thereof, or any false designation of origin, false or misleading description of fact, or false or misleading representation of fact, which is:

a) Likely to cause confusion, or to cause mistake or to deceive as to the affiliation, connection, or association of such person with another person, or as to the origin, sponsorship, or approval of his or her goods, services, or commercial activities by another person, or
b) In commercial advertising or promotion, misrepresents the nature, characteristics, qualities, or geographic origin of his or her or another person's goods, services or commercial activities.

Section 43 primarily lays out a claim against "unfair competition."

Thus under the US Act the likelihood of confusion forms the soul of provisions relating to infringement of trade mark and also dilution of trade mark. Section 43(a) provides for a larger scope or wider range of practices which are prohibited. The protection under Section 43(a) is on the premise of unfair competition whereas under Section 32 it is more precisely infringement of registered trade mark. Hence under Section 43(a) an unregistered mark which qualifies the conditions set out in that Section can on the grounds of unfair competition avail protection.

The degree of resemblance that is necessary to because confusion cannot be clearly defined. Hence to trader can adopt a mark which resembles another mark so as to mislead an ordinary purchaser of goods or services exercising ordinary caution.

Hence under the US Act a trade mark proprietor or a claimant can avail protection on the following grounds:

(a) It proves ownership of the trade mark, irrespective of whether the mark is registered or not.
(b) It proves that the defendant is using the mark in manner which creates confusion or deception in the market place.
(c) The use of such mark is not permitted by the claimant.
(d) The defendant has no valid defence.

Factors Relevant for Likelihood of Confusion

In ***AMF, Inc v. Sleekcraft Boats, 599 F.2d 341 (9th Cir.1979***) the Court had to decide as to whether the likelihood of confusion was a question of fact or a question of law. The Court held as under:

"Whether likelihood of confusion is a more question of law or one of the fact depends on the circumstances of ach particular case. To the extent that the conclusion of the trial court is based solely upon disputed findings of fact, the appellate court must follow the conclusion of the trial court, unless it finds that the underlying facts to be clearly erroneous. Thus, this Court refused on many occasions to decide de novo the facts underlying the trial court's determination of whether the likelihood of confusion existed [Carter Wallace, Inc v. Proctor & Gamble Co.,434 F.2d 794, 799 (9th Cir.1970); Paul Sachs Originals Co. v. Sachs, 325 F.2d 212, 214 (9th Cir.1963); Plough, Inc. v. Kreis Laboratories, 314 F.2d 635, 641 (9th Cir.1963)]. However, if the facts are not in dispute, the appellate court is 'in a good a position as the trial judge to determine the probability of confusion' [Fleischmann Distilling Corp v. Maier Brewing Co., supra, 314 F.2d (149) at 152]. The court then added a "corollary test":

"Where the conclusion of the trial court is based solely upon disputed findings of fact, the appellate court need not follow the conclusion of the trial court where its finds the underlying facts to be clearly erroneous."

The court thereupon went on to list down factors relevant to likelihood of confusion to find out whether confusion existed between related goods as under:

1. Strength of the mark;
2. Proximity of the goods;
3. Similarity of the marks;
4. Evidence of actual confusion;
5. Marketing channels used;
6. Type of goods and the degree of care likely to be exercised by the purchaser;
7. Defendant's intent in selecting the mark; and
8. Likelihood of expansion of the product lines.

CONCLUSION

The courts in US have held many a times that all the above factors or the majority of them need not be proved. Further presence of malice need not be an essential ground for an infringement proceeding. Hence, confusion is bound to exist whenever two similar or identical marks coexist in a market place. Hence we can see that while the principles of "likelihood of confusion" as exists in the Indian Trademark Act is similar to US law, the scope and the conditions and scope and ambit of various factors that go in to determination of public confusion is quite different and complex in US law when compared to the Indian position even extending the protection to qualifying unregistered marks.

REFERENCES

Ananth, Padmanabhan. (2017). ***IPR – Infringement and Remedies***. Lexis Nexis.

Arthur, P. Greeley. (2015). ***Registration of Trademarks under the New Trademark Act.***

Balachandran, V. (2016). ***Economic and other Legislations***. Vijaynicole Imprints, Chennai.

Jeffrey, Belson. (2017). ***Certification and Collective Marks – Law & Practice***. Edward Elgar Publication.

Mary, Lawrence. (2016). ***Trademark Law***. Karolina Academic Press.

Pandey, Neeraj, & Dharni, Khushdeep. (2014). ***Intellectual Property Rights***. New Delhi: Prentice Hall of India.

Retrieved from http://indianexpress.com/section/opinion/
Retrieved from http://manuals.ipaustralia.gov.au/trademarks/Part_19A_Use_of_a_Trade_Mark/19A.2_Use__as_a_...

Retrieved from http://marklaw.com/index.php/43-trademark-questions-answered/346-likelihood-of-confusion-f...

Retrieved from http://marklaw.com/index.php/trademark-terms-c/343-trademark-confusion-confusingly-similar...

Retrieved from http://nishithdesai.com/fileadmin/user_upload/pdfs/Research%20Papers/Competition_Law_in_In...

Retrieved from http://ssrana.in/Intellectual%20Property/Infringement/Infringement-of-Trademarks-in-India....

Retrieved from http://techlawjournal.com/statutes/15usc1114.asp

Retrieved from http://www.advocatekhoj.com/library/lawareas/trade/functions.php?Title=Trademark&STitl...

Retrieved from http://www.bartonbeebe.com/documents/Beebe%20-%20Multifactor%20Tests.pdf

Retrieved from http://www.camtrademarks.com/index.php?q=node/43

Retrieved from http://www.collerip.com/news-resources/news/2013/11/29/unregistered-trade-marks-and-common...

Retrieved from http://www.columbia.edu/~mr2651/ecommerce3/1st/Statutes/Lanham.pdf

Retrieved from http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/00513.html

Retrieved from http://www.dnaindia.com/money/comment-under-contract-act-banks-have-right-to-mark-lien-140...

Retrieved from http://www.familylawweek.co.uk/site.aspx?i=ed28706

Retrieved from http://www.gbw.solutions/CorpContent/CorpTerms

Retrieved from
http://www.hadleighcastings.com/uploads/HC-F07-03-06%20PURCHASING%20TERMS%20AND%20CONDITIO...

Retrieved from http://www.indianjobtalks.com/forum/showthread.php?t=73409

Retrieved from http://www.legalserviceindia.com/article/l65-Trademark-Protection-in-India.html

Retrieved from http://www.mondaq.com/india/x/48587/Trademark/Deceptive

Retrieved from http://www.mondaq.com/india/x/600602/Trademark/Joint

Retrieved from http://www.mondaq.com/india/x/624702/Insolvency

Retrieved from http://www.mondaq.com/x/312146/Trademark/Trade

Retrieved from http://www.rslr.in/uploads/3/2/0/5/32050109/trademark-_infringement_and_passing_off.pdf

Retrieved from http://www.tms.org/pubs/journals/JOM/matters/matters-9809.html

Retrieved from http://www.wipo.int/edocs/pubdocs/en/intproperty/791/wipo_pub_791.pdf

Retrieved from http://www17.us.archive.org/stream/ArsQuatuorCoronatorumVol.181905/Aqc181905_djvu.txt

Retrieved from https://advocatemmmohan.wordpress.com/2012/02/25/the-respondent-has-obtained-registration-...

Retrieved from https://advocatemmmohan.wordpress.com/2012/02/29/intellectual-property-appellate-boarda-pe...

Retrieved from https://advocatemmmohan.wordpress.com/2012/03/27/intellectual-property-appellate-board-as-...

Retrieved from https://advocatemmmohan.wordpress.com/2012/03/27/intellectual-property-appellate-board-the...

Retrieved from https://hnlusbj.files.wordpress.com/2016/11/tracing-the-jurisprudence-of-smell-marks-as-tr...

Retrieved from https://indiankanoon.org/doc/102666201

Retrieved from https://indiankanoon.org/doc/1114158

Retrieved from https://indiankanoon.org/doc/1389940/

Retrieved from https://indiankanoon.org/doc/1496902

Retrieved from https://indiankanoon.org/doc/1558275/

Retrieved from https://indiankanoon.org/doc/1592212

Retrieved from https://indiankanoon.org/doc/1960521/

Retrieved from https://indiankanoon.org/doc/324092

Retrieved from https://indiankanoon.org/doc/68619383/

Retrieved from https://ipkenya.wordpress.com/tag/registrar-of-trade-marks/

Retrieved from https://legaldesk.com/business/infringement-of-trademark-in-india

Retrieved from https://legalvision.com.au/how-can-copyright-be-infringed/

Retrieved from https://mikedugeri.wordpress.com/2017/04/27/the-proprietor-of-a-validly-registered-tradema...

Retrieved from https://singaporelegaladvice.com/law-articles/criminal-offences-relating-trade-marks/

Retrieved from https://stackoverflow.com/questions/25729982/grab-random-record-and-mark-as-being-used

Retrieved from https://thriftytrademarks.co.uk/use-of-an-identical-trade-mark-for-identical-goods-andor-s...

Retrieved from https://www.altacit.com/publication/the-new-indian-trademark-act/

Retrieved from https://www.bitlaw.com/source/15usc/1114.html

Retrieved from https://www.bitlaw.com/source/15usc/1125.html

Retrieved from https://www.copyright.gov/title17/92chap5.html

Retrieved from https://www.coursehero.com/file/p1hddg0/reproduce-counterfeit-copy-or-colorably-imitate-an...

Retrieved from https://www.coursehero.com/file/p64j5dp/likely-to-cause-confusion-mistake-or-deception-of-...

Retrieved from https://www.courtlistener.com/opinion/271400/maier-brewing-company-a-corp-v-the-fleischman...

Retrieved from https://www.courtlistener.com/opinion/330236/the-j-b-williams-company-inc-v-le-conte-cosme...

Retrieved from https://www.courts.ri.gov/Courts/workerscompensationcourt/AppellateDivision/Decisions/05-0...

Retrieved from https://www.cps.gov.uk/legal-guidance/fraud-act-2006

Retrieved from https://www.gov.uk/guidance/intellectual-property-crime-and-infringement

Retrieved from https://www.indiafilings.com/learn/identical-similar-trademark/

Retrieved from https://www.iponz.govt.nz/about-ip/trade-marks/practice-guidelines/current/relative-ground...

Retrieved from https://www.law.berkeley.edu/files/Peguera_Miquel_IPSC_paper_2014.pdf

Retrieved from https://www.law.cornell.edu/uscode/text/15/1114

Retrieved from https://www.law.cornell.edu/uscode/text/15/1125

Retrieved from https://www.law.cornell.edu/wex/trademark_infringement

Retrieved from https://www.lawteacher.net/free-law-essays/contract-law/the-offence-of-blackmailing-contra...

Retrieved from https://www.leagle.com/decision/1963537325f2d2121481

Retrieved from https://www.leagle.com/decision/1963624217fsupp4071539

Retrieved from https://www.legalcrystal.com/case/1183264/staar-surgical-company-vs-group-india

Retrieved from https://www.neustel.com/trademarks/trademark-infringement/

Retrieved from https://www.nolo.com/legal-encyclopedia/enforcing-trademark-rights-29902.html

Retrieved from https://www.nolo.com/legal-encyclopedia/likelihood-confusion-how-do-you-determine-trademar...

Retrieved from https://www.pattishall.com/pdf/LikelihoodofConfusion.pdf

Retrieved from https://www.twobirds.com/en/news/articles/2016/uk/ip-and-it-law-bytes-december/trade-marks...

Retrieved from https://www.uspto.gov/page/about-trademark-infringement

Retrieved from https://www.zepo.in/blog/2013/08/31/guide-how-to-register-trademark-for-your-brand-in/

*****

INFORMATION FOR AUTHORS

Pezzottaite Journals invite research to go for publication in other titles listed with us.

Invitations are for:

International Journal of Applied Services Marketing Perspectives.
International Journal of Entrepreneurship & Business Environment Perspectives.
International Journal of Organizational Behaviour & Management Perspectives.
International Journal of Retailing & Rural Business Perspectives.
International Journal of Applied Financial Management Perspectives.
International Journal of Information Technology & Computer Sciences Perspectives.
International Journal of Logistics & Supply Chain Management Perspectives.
International Journal of Trade & Global Business Perspectives.

All the titles are available in Print & Online Formats.

PEZZOTTAITE JOURNALS

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 8.924
H5-Index: 1, H5-Median: 1, H-Citations: 1

A COMPARATIVE ANALYSIS OF STRUCTURAL TRANSFORMATION BETWEEN HARYANA & PUNJAB

Gaurav Saini[6]

ABSTRACT

Structural change has been considered as one of the essential ingredients of modern economic growth. Without structural change, no country can get sustainable and inclusive growth. So structural transformation is vital issue for developing country like India. The big concern for Indian economy is still high employment share in agriculture sector, on the other hand declining the share in GDP year by year. Moreover, the Contribution of Agriculture sector in Indian economy is much higher than world's average (6.1%). Contribution of Industry and Service sector is lower than world's average 30.5% for Industry sector and 63.5% for Services sector respectively. Even service sector has high productivity still unable to absorb surplus labour of agriculture sector. So if we want to attain third stage of structure transformation then India have to give importance to quality and vocational education. So that we can produce skilled labour which will be suitable for service sector also. In comparison of Haryana and Punjab, no significant difference could be surfaced between Punjab and Haryana. Overall, it may be concluded that Haryana could secure higher growth rates of primary sector of NSDP as well as total NSDP. However Punjab did well in social parameters in comparison of Haryana like literacy rate, life expectancy rate at birth, woman literacy, HDI etc.

INTRODUCTION

Structural change has been considered as one of the essential ingredients of modern economic growth. As a stylized fact in development economics literature, structural change is defined as a reallocation of economic activity across three broad sectors of the economy (agriculture, industry, and services) that accompany the process of modern economic growth. The reallocation, induced by some policy measures, occurs as factors of production moved from lower productivity to higher productivity uses (Lewis, 1954; Chenery, H. 1986). For Kuznets structural changes not only in economic but also in social institutions and beliefs are required for modern economic growth (Kuznets, 1971). Structural transformation is necessary step for economic development but not sufficient. In fact, economic development and structural changes go side by side. During process of development, due to increase in real income, the preferences of consumers will transform from less income elasticity goods(agriculture goods) to highly income elasticity goods(manufacturing and services sector goods). This results in diminishing significance of primary producing activities and growing dominance of manufacturing and services activities. Any shift of labour and other sources from agriculture to secondary or services sector results in immediate increase in overall productivity and income per capita. In essence, four essential and interrelated process define structural transformation in any economy.

A decline share of agriculture in GDP and employment.
A rural to urban migration underpinned by rural and urban development.
The rise of a modern industrial and service economy.
A demography transition from high rate of births and death to low rate of births and deaths – associated with better heath in developed and urban areas. (United Nation Human Settlements Programme).

Achieving structural transformation is believed to be a priority agenda in development policy of developing countries like India. Without structural transformation, no country can attained sustained economic growth as well as inclusive growth and the scope for sustained increase in productivity narrows and consequently, the growth potential of the economy remains limited.

However, this narrow definition of structural transformation neglects the vital aspect of structural transformation: social transformation. This study tries to fill this gap by proposing some social indicators like morbidity rate, crude birth rate, urbanisation, education rate etc. This present paper is an attempt to understand structural transformation in India. What are the implications of structural transformation in India and comparative analysis of Haryana and Punjab? Identification of the factors that contribute in structural transformation in the region.

STRUCTURAL TRANSFORMATION IN INDIA

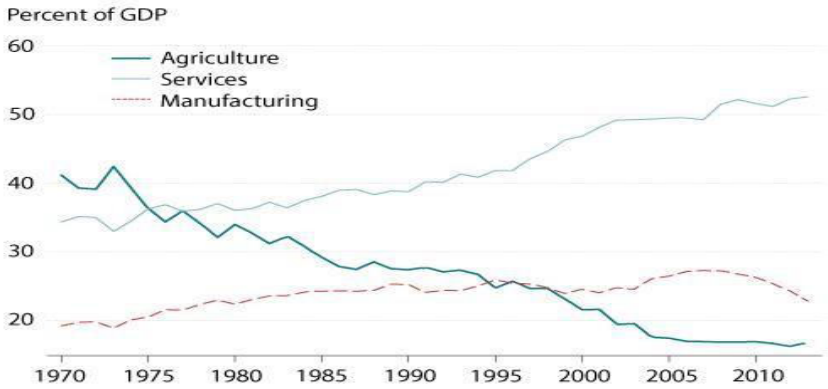
India's economic performance over the past two decades has often been excessively focussed on the achievement and prospects of a high rate of economic growth. Introduction of economic reforms in 1991 is seen as the turning point in India's post-

[6]Student, Department of Economics, I.G.N.O.U., New Delhi, India, gauravsaini45@gmail.com

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 8.924
H5-Index: 1, H5-Median: 1, H-Citations: 1

independence economic history, providing a break from the low growth trap in which the country's economy had been caught for four decades. India is a developing country currently undergoing a structural transformation. However, its path is somewhat different from that of a benchmark developed country. Figure 2 shows the GDP shares of the three sectors over the past four decades for India. The services share has increased dramatically and currently stands at 53 percent. In comparison, the manufacturing share has remained stagnant, growing only from 19 percent in 1970 to 23 percent in 2012.

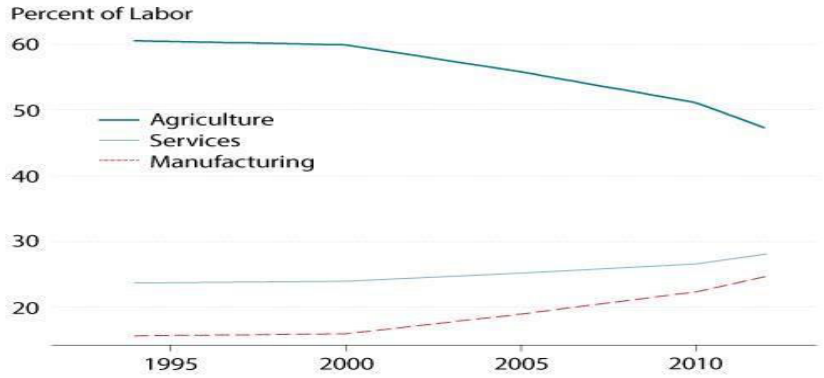
Figure 2
GDP Shares in India



SOURCE: World Bank World Development Indicators.

Sources: Authors Compilation

Figure 3
Labor Shares in India



SOURCE: World Bank World Development Indicators.

Sources: Authors Compilation

These changing shares of GDP suggest India might now be going through the second stage of its structural transformation. As shown in Figure 3, however, the manufacturing labour share has increased faster than the services labour share, which is unexpected. These findings imply that productivity in the services sector is remarkably higher than in the manufacturing sector and has sharply increased over the years.

This pattern of structural transformation in India is puzzling for two reasons. First, in principle, India's manufacturing and services sectors both operate in similar economic and regulatory environments. Second, compared with both developed and developing countries, the productivity of India's services sector relative to its manufacturing sector is an outlier. Its services sector is four times more productive than its manufacturing sector, whereas in most other countries the services sector is at most twice as productive (see Chari, Goel, 2015).

Why is India's structural transformation following such an unusual path? Is the cause a stagnant manufacturing sector or an exceptionally productive services sector?

It is possible that labour laws, lack of credit availability, and poor infrastructure more severely impede manufacturing firms than services firms. It has been argued that, because manufacturing is more dependent on intermediate inputs, pro-labour laws combined with regulation of input quotas have reduced productivity growth considerably more in the manufacturing sector than the services sector (see Gupta, 2009). These laws combined with lack of credit availability lead to non-optimal factor combinations in manufacturing firms but influence services firms far less.

Thus, while some studies attribute stagnant manufacturing in India to rigid labour laws and input quotas, others argue that rapid services growth is caused by increasing demand from manufacturing. We still do not have a comprehensive understanding, however, of why labour keeps moving into the manufacturing sector despite the already large and still widening productivity gap between the manufacturing and services sectors.

The big concern for Indian economy is still high employment share in agriculture sector, on the other hand declining the share in GDP year by year. Moreover, the Contribution of Agriculture sector in Indian economy is much higher than world's average (6.1%). Contribution of Industry and Service sector is lower than world's average 30.5% for Industry sector and 63.5% for Services sector respectively. Even service sector has high productivity still unable to absorb surplus labour of agriculture sector. There are so many reasons like unskilled labour, asymmetry information persisting in market etc. Service sector requires more skilled labour. But there is scarcity of skilled labour in India. Literacy rate in India is only 74.04% which is 10% below from world's literacy rate (84%). Only 24% of total enrolled students at primary level get enrolled in higher education. According to a survey, only 25% graduate of technical education and 15% graduate of general education are fit for employment. So it is a big concern for policy maker. While Indian government spends only 4-5% of GDP on education which is even less than Sri Lanka's expenditure on education. So if we want to attain third stage of structure transformation then India have to give importance to quality and vocational education. So that we can produce skilled labour which will be suitable for service sector also.

There are powerful empirical and theoretical arguments in favour of manufacturing growth as the main engine of growth in economic development. Theoretically, in comparison to, the manufacturing sector offers a large scope of capital accumulation, economics of scale, and embodied and disembodies technological progress, than do agriculture and services. Further, linkage and spill-over effects are also stronger in manufacturing than in agriculture or even services. This means, for instance, that employment growth in the manufacturing sector can positively influence productivity in other sectors as well, pushing the overall economy to a virtuous circle of high productivity and growth. Stagnation in the share of manufacturing sector in a country's GDP at low levels of income is a cause for serious concern. Belying the belief in service led growth, recent research by eminent development economists has shown that manufacturing is central to not only a nation's economy but also its democracy. A weak manufacturing sector may ultimately threaten the sustainability of a country's growth process. Concerned about the stagnant and low share of manufacturing, government, in line with a global trend, has launched several initiatives to promote manufacturing clusters over the past two decades. These are for instance: growth centres, food parks, textile parks, SEZs, and industrial parks. But, all of them have been languishing due to indecision, delays and policy reversals. If growth is to be sustained the country will have to adopt a well-defined development strategy that can address the issues being faced by the manufacturing sector. This will have an integrated framework to promote entrepreneurship and innovation, improve business climate and restore investors' confidence.

STRUCTURE TRANSFORMATION IN HARYANA AND PUNJAB:

Punjab and Haryana occupy an extremely important place in agriculture in India. Both of these two states are regarded as the Breadbasket of India and have contributed substantially to the country's food security. However, both face some major challenges which require some reorientation of priorities and new development strategies. Haryana which was initially at a lower level of economic development picked up subsequently. Now, a stage appears to have reached where Haryana's per capita income compares favourably with that of Punjab. Agricultural development has taken at a very fast rate in Punjab and Haryana especially after the mid-sixties due to Green Revolution. Haryana economy witnessed a very healthy annual real growth of 9.1%, as compared to 6.7% of Punjab and 7.9% of India during 11th Plan (2007-12). In 2012-13, the growth of real Gross State Domestic Product (GSDP) of Punjab was 5.2% only as compared to 7.1% of Haryana. There has been a relative deceleration in Punjab economy. During 1966-2013, the contribution of primary sector in GSDP of Punjab and Haryana went down from 58% to 21.8%, and 56.6% to 16%, respectively. Among all States the maximum growth in the workforce took place in the State of Haryana (2.83 percent) followed by the State of Punjab (2.53 per cent). Farm employment in Haryana has improved significantly in contrast with that in Punjab, but there are regional disparities in farm income in Haryana. Punjab once one of the richest Indian States, is now fast becoming poor amid economic challenges like shrinking land holdings, migration and the absence of big industries. On the other hand Haryana today is one of the fastest growing economies in the country. Experts ascribe the slow growth in Per Capita Income in Punjab to sluggishness in the agriculture sector.

Percentage Share of Primary Sector in NSDP of Punjab and Haryana in NSDP during 1970-71 to 2011-12:

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 8.924
H5-Index: 1, H5-Median: 1, H-Citations: 1

Over the past 42 years, the states of Punjab and Haryana have experienced a significance structural transformation. At the beginning of the present study, during 1970-71 economies of both the States were predominantly rural and agricultural. But with the passage of time, in 2011-12 Industry and Services Sectors registered much higher growth rate than in agricultural sector in Haryana but the picture is not bright for the economy of Punjab. A close examination of the study of Table 1 shows that Primary Sector was the dominant sector of the economy of Punjab and Haryana and accounted for 58.36 in NSDP of Punjab and 64.74 percent in Haryana's NSDP. After fluctuations the share of Primary sectors of both Punjab and Haryana in 1979-80 declined to 47.43 percent and 51.77 percent respectively in Punjab and Haryana.

Table-1: Percentage Share of Primary Sector of Punjab and Haryana to NSDP at Constant Prices

Year	Haryana	Punjab
1970-1980	59.88	55.26
1981-1990	46.09	44.99
1991-2000	40.18	42.95
2001-2010	24.99	34.54
2013-2014	15.30	28.13

Sources: Authors Compilation

Again during Period-II Primary sector was the driving sector of both the States. In 1980-81 the primary sector was the dominant sector of the economy of Punjab and Haryana and accounted for 44.12 percent in NSDP of Punjab and 54.60 percent in Haryana's NSDP. After fluctuations the share of Primary sector of Punjab was 45.82 marginally higher than 1980-81 and of Haryana declined to 43.82 percent in 1989-90. In 1990-91 the primary sector was the dominant sector of the economy of Punjab and Haryana. The share of Primary sector of Punjab decreased to 34.21 percent from 45.54 percent during this Period while in Haryana this share decreased to 32.53 percent from 44.71 percent. The relative share of primary sector to NSDP was 38.30 percent in Punjab and 32.13 percent in Haryana in 2000-01 which fell down to 30.77 percent in Punjab and 21.54 percent in Haryana in 2011-12. The relative share of primary sector to NSDP was 58.36 percent in Punjab and 64.74 percent in Haryana in
1970-71 which fell down to 30.77 percent in Punjab and 21.54 percent in Haryana in 2011-12. Agricultural development has taken at a very fast rate in Punjab and Haryana especially after the mid-sixties due to Green Revolution.

Table-2: Comparison of Structural Transformation among Haryana, Punjab and India

Sectors	1993-1994			2004-05			2013-14		
	Haryana	Punjab	India	Haryana	Punjab	India	Haryana	Punjab	India
Primary	42.50	46.13	33.50	23.30	32.67	21.90	15.30	29.20	15.80
Secondary	26.20	21.76	23.70	32.70	24.74	25.10	27.70	24.69	24.30
Tertiary	31.30	32.12	42.80	44.00	42.59	53.00	57.00	46.11	59.90
Total	100	100	100	100	100	100	100	100	100

Sources: Authors Compilation

Haryana economy witnessed a very healthy annual real growth of 9.1%, as compared to 6.7% of Punjab and 7.9% of India during 11th Plan (2007-12). In 2012-13, the growth of real Gross State Domestic Product (GSDP) of Punjab was 5.2% only as compared to 7.1% of Haryana. There has been a relative deceleration in Punjab economy. Per capita income in Punjab (Rs 114561) is very less than Haryana (Rs 180174) in 2015-2016. However, Punjab has high consumption based HDI (0.605) in comparison to Haryana 0.552 in 2007-2008. In 2015, Punjab's HDI (0.6614) is slightly greater than Haryana's HDI (0.6613). In term of literacy, Punjab (76.68%) performed better than Haryana (76.64%) in 2011. Even female literacy rate in Punjab (71.34) is far more than that in Haryana (66.77). Life expectancy at birth in Punjab (71.6 years) is better than Haryana (68.6 year). Regional disparity in every aspect in Haryana is greater than Punjab. So we can say evidently that Punjab performed better in every social parameters but lagged behind in economic parameters.

Table-3: Comparison of Social Parameters

	Punjab	Haryana
Women Literacy Rate	71.34	66.77
Literacy Rate	76.68	76.64
Sex Ratio	895	879
Life Expectancy at Birth	68.60	66.77
Consumption Based HDI	0.605	0.552
HDI	0.6614	0.6613

Sources: Authors Compilation

There is an urgent need to adopt suitable corrective measure to boost capital formation, especially towards agricultural infrastructure and manufacturing sectors in both the neighbouring states of Punjab and Haryana. Since productivity in agricultural sector of Punjab has already started showing signs of stagnation and that small-scale sector in the state has been grossly wiped out (because of a large-scale shifting of industrial units to the adjoining hilly states due to tax incentives); as a result, the Punjab state has experienced a rapid deterioration in its financial health. Therefore, the state needs to give a serious reconsideration towards providing freebies (under populist measures) like water and electricity (across the board) in agriculture sector; cast-based free distribution of electricity; distribution of subsidised food items under Atta-Dal scheme to a large section; withdrawal of octroi in towns and cities; loan waivers from time-to-time; disbursement of money to the families of suicide committers; etc. Before giving such economic incentives, genuineness of the concerned cases need be examined critically, otherwise such measures may lead to wastages and corruption, and would further deplete economic conditions of the state. The state government, instead, needs to make allocation of its limited resources towards productive purposes via strengthening its physical infrastructure. Such steps would expectedly create a congenial environment for attracting foreign investment in the state, thereby improving employability of its youth.

CONCLUDING REMARKS AND POLICY IMPLICATIONS

On the average of 42 years under study, no significant difference could be surfaced between Punjab and Haryana. Overall, it may be concluded that Haryana could secure higher growth rates of primary sector of NSDP as well as total NSDP. However Punjab did well in social parameters in comparison of Haryana like literacy rate, life expectancy rate at birth, woman literacy, HDI etc. Primary sector exhibited crisis of stagnation during 1970-71 to 1979-80 and 2000-01 to 2011-12 in both the states. The incidence of farmer suicides can be traced out of this. The people of Punjab may be known for their lavish lifestyle and high spending power but it is true that the state itself lags behind Haryana as far as Per Capita Income is concerned. But it cannot be denied that agriculture forms the backbone of Haryana and Punjab economy. The share of agriculture to state income is also the highest; and it is also a source of supply of raw materials to the leading industries of the state. Hence, the prosperity of agriculture stands for prosperity of Haryana and Punjab. In order to raise state income and per capita income, it is essential that at least for some more, agriculture development may be given greater emphasis in Haryana and Punjab. Government should give emphasis on cash crop, organic agriculture and horticulture. Government should educate the farmers about using fertilizers, best seeds, and new technique of farming. This will boost the productivity and income of farmers. To achieve a rapid increase in incomes at least in the initial period, a greater proportion of investment should be made in agriculture. To address the issue of employability, the education system needs to be ready for changes in its organizational structure, policies, teaching-learning processes and the type of academic offerings. Universities need to be more than just the centres of knowledge transmission; they need to prepare a skilled work force ready to be absorbed in the market. Government should increase expenditure on education and research. No nation can be build a great nation without education. Government should promote manufacturing sector to absorb the surplus labour of agriculture sector because it is well recognised that growth in manufacturing output also creates new jobs in other sectors of the economy, through indirect input-output linkages. Given the strong backward and forward linkages of the manufacturing sector with the rest of the economy, its employment generation potential is much larger than that of other sectors.

REFERENCES

Sethi, A. S. (2003). Inter-Sectoral Linkages in Haryana's Income – A Temporal Analysis. ***Artha Vijnana,*** 45(3 & 4), 147-160.

Retrieved from http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52010DC2020

Retrieved from http://gjar.org/publishpaper/vol2issue8/d290r50.pdf

Retrieved from http://isid.org.in/pdf/WP1202.pdf

Retrieved from http://pbplanning.gov.in/aboutus.htm

Retrieved from http://shodhganga.inflibnet.ac.in/bitstream/10603/51232/7/07_chapter%202.pdf

Retrieved from http://statisticstimes.com/economy/economy-of-haryana.php

Retrieved from http://www.businessdictionary.com/definition/initiatives.html

Retrieved from http://www.differencebetween.net/miscellaneous/politics/difference-between-developed-and-d...

Retrieved from http://www.econ.yale.edu/growth_pdf/cdp900.pdf

Retrieved from http://www.epc.eu/documents/uploads/pub_1160_skills_and_education.pdf

Retrieved from http://www.igidr.ac.in/pdf/publication/WP-2012-014.pdf

Retrieved from http://www.ijbhtnet.com/journals/Vol_3_No_8_December_2013/19.pdf

Retrieved from http://www.indiabix.com/group-discussion/topics-with-answers/

Retrieved from http://www.nios.ac.in/media/documents/316courseE/ch28.pdf

Retrieved from http://www.oecd.org/eco/growth/18450995.pdf

Retrieved from http://www.pbplanning.gov.in/pdf/Gender%20Statistics%20%202012%20final.pdf

Retrieved from http://www.pbplanning.gov.in/pdf/MPLADS.pdf

Retrieved from http://www.planningcommission.gov.in/plans/planrel/12thplan/pdf/12fyp_vol3.pdf

Retrieved from http://www.punjabdata.com/GDP-and-Per-Capita-Income-of-Punjab.aspx

Retrieved from http://www.siecon.org/online/wp-content/uploads/2014/10/Behera-Tiwari-56.pdf

Retrieved from https://countryeconomy.com/demography/life-expectancy/india

Retrieved from https://data.worldbank.org/indicator/SP.DYN.LE00.FE.IN

Retrieved from https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu...

Retrieved from https://gradestack.com/NTSE-Complete-Course/Work-Life-and-Leisure/Industrialisation-and-th...

Retrieved from https://iasbaba.com/2015/09/q-5-is-agriculture-the-backbone-of-the-indian-economy-critical...

Retrieved from https://keydifferences.com/difference-between-developed-countries-and-developing-countries...

Retrieved from https://link.springer.com/content/pdf/10.1007%2F978-1-349-63663-1_12.pdf

Retrieved from https://link.springer.com/content/pdf/10.1007/978-1-349-63663-1_12.pdf

Retrieved from https://mpra.ub.uni-muenchen.de/62920/1/MPRA_paper_62920.pdf

Retrieved from https://research.stlouisfed.org/publications/economic-synopses/2015/10/02/indias-atypical-...

Retrieved from https://unhabitat.org/wp-content/uploads/2016/04/Structural-Transformation-in-Developing-C...

Retrieved from https://www.abebooks.com/book-search/title/development-labor-surplus-economy/

Retrieved from https://www.babycenter.in/pregnancy-labour-and-birth

Retrieved from https://www.csudh.edu/university-catalog/2015-16/general-information/

Retrieved from https://www.ibef.org/download/Haryana-July-2017.pdf

Retrieved from https://www.imf.org/en/News/Articles/2015/09/28/04/53/sp082500

Retrieved from https://www.importantindia.com/12603/agriculture-is-the-backbone-of-indian-economy/

Retrieved from https://www.indiabix.com/group-discussion/topics-with-answers/

Retrieved from https://www.mbaskool.com/business-articles/finance/1228-structural-transformation-in-india...

Retrieved from https://www.nap.edu/read/10144/chapter/11

Retrieved from https://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1971/kuznets-lecture.h...

Retrieved from https://www.nuffield.ox.ac.uk/users/Broadberry/ModernEconomicGrowth6a.pdf

Retrieved from https://www.quora.com/What-is-the-change-in-the-size-and-pattern-of-contribution-of-primar...

Retrieved from https://www.researchgate.net/publication/233756192_Inter-Sectoral_Linkages_in_Haryana%27s_...

Retrieved from https://www.researchgate.net/publication/233761524_Capital_Formation_in_Punjab_and_Haryana...

Retrieved from https://www.researchgate.net/publication/277312984_STRUCTURAL_TRANSFORMATION_IN_ETHIOPIA_T...

Retrieved from https://www.thebalance.com/per-capita-what-it-means-calculation-how-to-use-it-3305876

Retrieved from https://www.uaeinteract.com/uaeint_misc/pdf/perspectives/12.pdf

*****

BUSINESS PROPOSAL FOR CONFERENCES PUBLICATIONS IN JOURNALS / AS PROCEEDINGS

We are pleased to present this proposal to you as publisher of quality research findings in / as Journals / Special Issues, or Conference Proceedings under Brand Name '**Pezzottaite Journals**'. We aims to provide the most complete and reliable source of information on current developments in the different disciplines. The emphasis will be on publishing quality articles rapidly and making them available to researchers worldwide. Pezzottaite Journals is dedicated to publish peer-reviewed significant research work and delivering quality content through information sharing.

Pezzottaite Journals extends an opportunity to the 'Organizers of Conferences & Seminars' from around the world to get 'Plagiarism Free' research work published in our Journals, submitted and presented by the participants within the said events either organized by /at your Department / Institution / College or in collaboration.

As you know, the overall success of a refereed journal is highly dependent on the quality and timely reviews, keeping this in mind, all our research journals are peer-reviewed to ensure and to bring the highest quality research to the widest possible audience. The papers submitted with us, will follow a well-defined process of publication and on mutual consent. Publications are made in accordance to policies and guidelines of Pezzottaite Journals. Moreover, our Journals are accessible worldwide as 'Online' and 'Print' volumes.

We strongly believe in our responsibility as stewards of a public trust. Therefore, we strictly avoid even the appearance of conflicts-of-interest; we adhere to processes and policies that have been carefully developed to provide clear and objective information, and it is mandate for collaborating members to follow them.

Success Stories:

We had successfully covered 11 International Conferences and received appreciation from all of them.

If you have any query, editorinchief@pezzottaitejournals.net, contactus@pezzottaitejournals.net. We will respond to your inquiry, shortly. If you have links / or are associated with other organizers, feel free to forward 'Pezzottaite Journals' to them.

It will indeed be a pleasure to get associated with an educational institution like yours.

(sd/-)
(Editor-In-Chief)

Editor-In-Chief
Pezzottaite Journals
Saraswati Lane, Adjacent Nataraj Dance Academy, Near Modern Dewan Beverages, Jammu Tawi – 180002,
Jammu and Kashmir, India.

PEZZOTTAITE JOURNALS

Volume 7, Number 1, January – March' 2018
ISSN (Print): 2319-9059, (Online): 2319-9067
SJIF (2016): 7.194, SJIF (2017): 8.924
H5-Index: 1, H5-Median: 1, H-Citations: 1

IMPACT ASSESSMENT OF e-GOVERNANCE: A CASE STUDY OF SUWIDHA CENTRES IN PUNJAB

Dr. Jyoti[7]

ABSTRACT

In Punjab, e-Governance is being implemented through three ways i.e. core e-Governance projects, front-end delivery channels and department level e-Governance projects. Suwidha centre is a front-end delivery channel, which started in 2003 at Fatehgarh Sahib and is providing various services to citizens under same roof in a time bound manner. In this paper, an attempt has been made to assess the economic, quality of governance and process improvement impact of Suwidha centres on citizens. To meet this objectives, a well-structured questionnaire has been made which have been filled through direct personal interview method from 250 respondents (service users) who were found availing the services from the Suwidha centres during the time of survey from three districts of Punjab namely Hoshiarpur, Patiala and Mansa (selected on the basis of high, medium and low literacy levels in Punjab, respectively). The study concludes that Suwidha centres have increased speed and efficiency in the working process to much extent followed by decrease in time and effort and cost of availing the services. It has also increased transparency in the working procedures. As far as dependence on agents, level of corruption, accountability in the actions of officials, clarity in procedures, convenience of working hours and design of forms while availing the services of Suwidha centres are concerned, there is need of further improvement.

INTRODUCTION

e-Governance is broadly defined 'as an application of information technology to the functioning of the government'. It relies heavily on the effective use of internet and other emerging technologies with an aim to receive and deliver information and services easily, quickly, efficiently and inexpensively. Through these modes 'e-Governance' is trying to create comfortable, transparent and cheap interaction between government and citizens, government, business enterprises, and different levels of governments with cost-effective and high-quality public service delivery (Thapliyal, 2008). In Punjab, e-Governance is being implemented through three ways i.e. core e-Governance projects, front-end delivery channels and department level e-Governance projects (www.dgrpunjab.in). Suwidha centre is a front-end delivery channel, which started in 2003 at Fatehgarh Sahib and is providing various services to citizens under same roof in a time bound manner. The main objectives of Suwidha centres in Punjab are to provide facilitated and quality services by re-organizing government processes, to reduce delay in services delivery by integrating back-end and front-end procedures, to provide on-line status of applications and to standardize the process throughout the state. Services provided by Suwidha centres are issuance of birth/death certificate, attestation of affidavits, issuance and renewal of driving license, registration of vehicle and issuance of nationality certificate etc.
www.suwidhaonline.punjab.gov.in

OBJECTIVES OF STUDY

In this paper, an attempt has been made to assess the impact of Suwidha centres on citizens. However, the specific objectives are:

To analyse the socio-economic profile of the respondents.
To assess the economic impact of Suwidha centres.
To assess the quality of governance after the implementation of Suwidha centres.
To analyse the process improvements in availing the services of Suwidha centres in Punjab.
To study the overall impact of Suwidha centres in Punjab.
To study the various types of problems faced by the respondents in availing the services of Suwidha centres in Punjab.

RESEARCH METHODOLOGY

To meet these objectives, both primary as well as secondary data has been used. Secondary data has been collected from the reports, journals and articles related to e-Governance in Punjab. For primary data, a well-structured questionnaire has been made to analyse the perceptions of the respondents about Suwidha centres in Punjab. The questionnaires have been filled through direct personal interview method from 250 respondents (service users) who were found availing the services from the Suwidha centres during the time of survey from three districts of Punjab namely Hoshiarpur, Patiala and Mansa (selected on the basis of high, medium and low literacy levels in Punjab, respectively). Standard statistical tools such as mean values, percentage and five-point

[7]'Assistant Professor, Department of Economics, GGDSD College, Punjab, India, gargj10@gmail.com

Likert scale have been used while carrying out the tabular analysis. The impact of Suwidha centres on citizens has been assessed through three key attributes as shown in Table 1.

Table-1: List of Factors to Study the Significance of e-Governance

Key Attributes	Factor Code	Details of Factors
Economic	F1	Cost of Services
	F2	Time and Efforts
	F3	Dependence on Agents
Quality of Governance	F4	Level of Corruption
	F5	Accountability
	F6	Transparency
Process Improvements	F7	Clarity in Procedure
	F8	Speed and Efficiency
	F9	Convenience of Working Hours
	F10	Design of Forms

Sources: Authors Compilation

Table-1 shows that there are total 10 factors which have been categorized in three different attributes, i.e., economic, quality of governance and process improvement. Economic attributes comprise of cost of services, time and efforts and dependence on agents; factors showing quality of governance contain level of corruption, accountability in the actions of officials and transparency in the working system. Lastly, the factors, which show process improvements, are clarity in procedures, speed and efficiency, convenience of working hours and design of application forms filled to avail the services after the implementation of Suwidha centres.

RESULTS AND DISCUSSION

Before going for discussion on the perceptions of respondents about Suwidha centres, it is relevant here to have an overview of their socio-economic characteristics. The information about socio-economic characteristics of the respondents of Suwidha centres is contained in Table-2. The table depicts that majority of the respondents, i.e., 66.40 per cent are male as compared to 33.60 percent female respondents. This may be because of the reason that women mostly prefer to do domestic chores while men go outside homes. As far as the age group of the respondents is concerned, maximum number of respondents, (71.20 percent) are found in the age group of 15-45 years. The pattern of the education level of the respondents reveals that the highest proportion of the respondents is graduate followed by respondents having secondary education. When respondents are categorized according to their occupation, then it is found that maximum number of respondents is students followed by the respondents having the occupation of farming. As Sikh community dominates Punjab, so the distribution of the respondents based on their religion shows that more than half of the respondents belong to Sikh community.

Table-2: Social and Economic Profile of Respondents

S. No.	Particulars	Number of Respondents	Percentage
1	**Sex-wise**		
	Male	166	66.40
	Female	84	33.60
	Total	**250**	**100.00**
2	**Age-wise (in Years)**		
	15-30	111	44.40
	30-45	67	26.80
	45-60	48	19.20
	60 & Above	24	9.60
	Total	**250**	**100.00**
3	**Educational Qualification**		
	Illiterate	15	6.00
	Primary	17	6.80
	Middle	23	9.20
	Matric	32	12.80
	Secondary	47	18.80
	Graduate	78	31.20

	Post-graduation	29	11.60
	Other	9	3.60
	Total	**250**	**100.00**
4	**Occupation**		
	Unemployed	28	11.20
	Government job	25	10.00
	Private job	38	15.20
	Self-employed	33	13.20
	Student	68	27.20
	Farming	53	21.20
	Other	5	2.00
	Total	**250**	**100.00**
5	**Religion**		
	Hindu	112	44.80
	Sikh	129	51.60
	Muslim	9	3.60
	Total	**250**	**100.00**

Sources: Field Survey, 2015

The impact assessment of Suwidha centres has been analysed by calculating the mean score of satisfaction level of the respondents regarding the key attributes (Table-1) selected for the study and has been shown in Table-3.

Table-3: Mean Scores of Level of Satisfaction and Ranks of the Selected Factors

Key Attributes	Factor Code	Details of Factors	Mean Score	Rank
Economic	F1	Cost of Services	4.05	2
	F2	Time and Efforts	4.29	1
	F3	Dependence on Agents	3.68	3
Quality of Governance	F4	Level of Corruption	3.45	3
	F5	Accountability	3.63	2
	F6	Transparency	4.00	1
Process Improvements	F7	Clarity in Procedure	3.64	2
	F8	Speed and Efficiency	4.31	1
	F9	Convenience of Working Hours	3.34	4
	F10	Design of Forms	3.65	3

Sources: Field Survey, 2015

Note: Mean Score of satisfaction level is the average of preferences of the respondents regarding the attribute ranging from 1 to 5.

"1" represents 'Much worsened'
"2" represents 'Somewhat worsened'
"3" represents 'No change'
"4" represents 'Somewhat improved'
"5" represents 'Much improved'

As far as economic factors are concerned, the table depicts that the factor 'time and effort (F2)' has scored first rank with the highest mean score of satisfaction level, i.e., 4.29 followed by the factors 'cost of availing services (F1)' and 'need of agents/intermediaries (F3)' having second and third ranks. This shows that Suwidha centres have reduced time and effort in availing the services as compared to the previous traditional or manual system. A study conducted by Singla and Aggarwal (2012) also shows similar results that computerization in public delivery system has reduced time and efforts in availing the services. The cost of availing service through Suwidha centres has also improved as compared to the previous traditional or manual system. However, the satisfaction level regarding the factor, i.e., 'need of agents / intermediaries (F3)' shows that there is not much impact of Suwidha centres in reducing the need of intermediaries while availing the services.

'Transparency' from the factors showing quality of governance has got first rank which shows that as compared to traditional system, the respondents perceive the Suwidha centres have increased transparency in the governance. On the other hand, the respondents ranked 'accountability' (3.63) at the next. While, the lowest rank of 'corruption' (3.45) reveals that this menace still prevails in the system so the respondents are relatively less satisfied. This finding of the study matches with other finding (Singla

and Aggarwal, 2011) which shows that the average score of transparency comes to be high, i.e., 4.28 but accountability and level of corruption need more betterment.

When a comparison is made between the Suwidha centres and traditional system regarding the factors of process improvement then Table-4 depicts that the Suwidha centres have increased 'speed and efficiency' (4.31) in the working system while other factors like 'clarity in the procedures' (3.64), 'design of forms' (3.65) and 'convenience of working hours' (3.34) need further improvement.

To adjudge the relative performance of key attributes or simply we can say to find out the main benefits of Suwidha centres to the citizens, the overall ranking of the mean scores of satisfaction level of all the factors of Suwidha centres belonging to economic, quality of governance and process improvement attributes has been made which has been shown in Table 4.

Table-4: Overall Ranking Of the Factors of G2C Category Project Suwidha Centres

Factor Code	Details of Factors	Mean Score	Rank
F1	Cost of service	4.05	3
F2	Time and effort	4.29	2
F3	Dependence on agents	3.68	5
F4	Level of corruption	3.45	9
F5	Accountability	3.63	8
F6	Transparency	4.00	4
F7	Clarity in procedure	3.64	7
F8	Speed and efficiency	4.31	1
F9	Convenience of working hours	3.34	10
F10	Design of forms	3.65	6

Sources: Field Survey, 2015
Note: Mean Score of satisfaction level is the average of the preferences of the respondents regarding the attribute ranging from 1 to 5.
"1" represents 'Much worsened'
"2" represents 'Somewhat worsened'
"3" represents 'No change'
"4" represents 'Somewhat improved'
"5" represents 'Much improved'

Table-4 shows that there are four factors, i.e. Speed and efficiency; time and effort; cost of availing services; and level of transparency, which have mean, scores more than 4. This shows that Suwidha centres have increased speed and efficiency in the working process to much extent followed by decrease in time and effort and cost of availing the services. It has also increased transparency in the working procedures. As other factors like dependence on agents, level of corruption, accountability in the actions of officials, clarity in procedures, convenience of working hours; and design of forms are concerned, all carry mean scores of satisfaction level less than 4 which show that Suwidha centres have not decreased the dependence of agents and level of corruption to much extent. As far as clarity in procedures and accountability in the actions of officials are concerned, the respondents seem less satisfied. Therefore, there should be further improvement in the working procedure of Suwidha centres in Punjab.

Problems Faced by Respondents

Suwidha is a front-end delivery channel and the services provided by Suwidha centres are issuance of birth / death certificate, attestation of affidavits, issuance and renewal of driving license, registration of vehicle and issuance of nationality certificate etc. The problems faced by the respondents of Suwidha centres are shown in Table-5.

Table-5: List of Problems Faced by Respondents of Selected G2C Category Project Suwidha

S. No.	Problems	Problems Faced by Respondents (in Percentage)
1.	Lack of Understanding due to Illiteracy and Lower Level of Education	64.11
2.	Need of Agents in Getting Services	34.87
3.	Non-Satisfactory Behaviour of the Functionaries	49.73
4.	Inconvenient Working Hours	35.57
5.	Rural-urban Disparities in Accessibility of Services	48.33

6.	Long Waiting Time for Availing the Services	61.11
7.	Multiple Windows for Availing Single Service	32.88
8.	Networking Problem	45.27
9.	Shortage of Staff	70.03
10.	Lack of Clarity regarding the Working Procedures	42.59

Sources: Field Survey 2015

The detailed analysis of these problems is as follows:

1) Lack of Understanding due to Illiteracy and Low Literacy

The field survey shows that lack of understanding because of low literacy level is one of the major challenges in getting the services from Suwidha centres in Punjab. Though literacy rate has an upward trend in Punjab from 69.70 per cent to 75.84 per cent during the period of 2001 to 2011 but the Table-5 depicts that nearly two-thirds of the total respondents (64.11 per cent) have reported that because of illiteracy, lower level of education and computer illiteracy they are not able to understand the procedures to get the work done at the Suwidha centres. So, low literacy, lower level of education and computer illiteracy among the citizens of Punjab are the main hurdles, which restricts the equal benefits of the Suwidha centres to the people of Punjab.

2) Need of Agents in Getting Services

Even after a decade of the establishment of Suwidha centres, it is noticed that nearly one-third of the respondents (34.87 per cent) still need the help from intermediaries for availing the services of Suwidha centres. Moreover, it is further noticed that female, old and illiterate respondents have more need of intermediaries as their other counterparts.

3) Non Satisfactory Behaviour of the Functionaries

Behavior of functionaries of Suwidha centres is also one of the problems faced by the citizens in getting services from it. Nearly half of the respondents (49.73 per cent) are on the view that behavior of officials is not satisfactory for them.

4) Inconvenient Working Hours

However, the timing of getting services from the Suwidha centres is 9.00 A.M. to 5.00 P.M., but the field survey shows that nearly one-third respondents (35.57 per cent) do not find time schedule convenient to them. This is because of the reason that the people who have job duration of 9.00 AM to 5.00 PM find it very difficult to manage time to go to the Suwidha centres for their works. Therefore, people want the Suwidha centres to remain open on Saturdays and Sundays also so that they can avail the services of Suwidha centres without taking leaves from their jobs. Moreover, there should be odd hours/shifts of working after 5.00 P.M.

5) Rural-urban Disparities in Accessibility of Services

The concept of e-Governance aims at increasing efficiency and effectiveness of the government, but these goals can be achieved only if the services provided by e-Governance would be available to all of the citizens equally. The table-5 shows that 48.33 per cent respondents do not agree on the view that services of Suwidha centres are equally accessible to people of both rural and urban areas. The main reason behind this is that Suwidha centres are mainly located in the cities and rural people have to cover a long distance to come to the cities for availing the services of Suwidha centres.

6) Long Waiting Time for Availing the Services

The process of delivering services to the public in the government offices has always been slow and there has been unreasonable delay even in the routine matters. Therefore, the Suwidha centres were opened with an aim of delivering quick services to the citizens under the same roof. However, the table-5 shows that 61.11 per cent of the total respondents are on the view that the waiting time for availing the services at Suwidha centres in Punjab is still high due to long queues.

7) Multiple Windows for Availing Single Service

Though Suwidha centres are providing different types of services to citizens under one roof, but nearly one-third of the total respondents (32.88 per cent) feel that there are so many windows which they have to visits for getting single service done, i.e., if a citizen has to apply for driving license, he has to visit multiple windows for various types of activities related to get the service done, i.e., for submission of form, for medical test, for photo etc. This whole process makes the completion of work very tough.

8) Networking Problem

The internet connectivity at the Suwidha centres is not smooth as servers remain down more often so the citizens have to wait for the long time. The field survey shows that 45.27 per cent respondents are complaining that there is problem of internet connectivity at the Suwidha centres in Punjab.

9) Shortage of Staff

The shortage of staff at the Suwidha centres is the main challenge for the citizens who avail the services from it. Due to the shortage of staff, the citizens have to wait for many hours and have to stay in long queues. Moreover, if the concerned employee of the Suwidha centre regarding the particular service is on leave, then the citizens have to make multiple visits at the Suwidha centres. Table-5 reveals that 70.03 per cent respondents face many problems because of shortage of staff.

10) Lack Clarity regarding the Working Procedures

Suwidha centres are opened by Punjab government for the convenience of people and for the quick delivery of services. However, it is noticed during the field survey that the citizens are not much aware regarding the working procedures of availing services at Suwidha centres in Punjab. They have hesitations while availing services from Suwidha centres. Table-5 shows that 42.59 per cent of total respondents have not much clarity about the working procedures of Suwidha centres in Punjab.

CONCLUSIONS

Suwidha centre is a front-end delivery channel that is providing various services to the citizens under same roof in a time bound manner. Based on the findings of this study, it can be concluded that the students and the farmers are more users of Suwidha centres as they visit more for availing various services provided under it.

The study shows that e-Governance has reduced time and effort and cost of availing services in general but specifically illiterate and people of higher age do not feel so. As far as the comparison between Suwidha centres and previous system regarding the dependence on agents is concerned, it is still intact and again there is more need of agents for illiterate and people with higher age.

The assessment of quality of governance factors shows that as compared to previous manual system, Suwidha centres have increased transparency in the governance but the level of satisfaction of the people has remained low on the issue regarding the reduction in level of corruption and for increasing accountability in the actions of officials. Variations in the level of satisfaction are found among the perceptions of the respondents in various categories.

The factors of process improvement highlight that Suwidha centres have increased speed and efficiency in the working system while other factors like clarity in procedures, design of forms and convenience of working hours need further improvement. The respondents who are literate, younger and doing jobs whether private or government have shown their higher level of satisfaction on the other hand, the respondents who are illiterate, higher aged and having the occupation of farming are less satisfied over the issue that Suwidha centres have increased clarity, speed and efficiency in getting services done.

REFERENCES

Thapliyal, M. P. (2008). Challenges in Developing Citizen- Centric e-Governance in India. In A. Ojha (ed.), ***e-Governance in Practice***, pp. 64-68. New Delhi: Gift Publishing.

Singla, S. K., & Aggarwal, H. (2011). Combating Corruption through e-Governance in Public Service Delivery System. ***Journal of Global Research in Computer Science,*** 2(7), 96-100.

Singla, S. K., & Aggarwal, H. (2012). Impact and Scope of e-Governance Initiatives in State of Punjab (India). ***International Journal of Computer Applications***, 44(14), 5-9.

Retrieved from http://ijmas.com/upcomingissue/28.01.2016.pdf

Retrieved from http://indiaegovernance.blogspot.com/2008/03/scope-of-e-governance.html

Retrieved from http://ludhianaonline.com/pages/suvidha_centre/

Retrieved from http://meity.gov.in/content/assessment-e-governance-projects

Retrieved from http://meity.gov.in/writereaddata/files/Impact_Assessment_Report.pdf

Retrieved from http://pbsc.nic.in/pdf/districts/mohali.pdf

Retrieved from http://shodhganga.inflibnet.ac.in/bitstream/10603/13544/10/10_chapter%202.pdf

Retrieved from http://shodhganga.inflibnet.ac.in/bitstream/10603/13544/11/11_chapter%203.pdf

Retrieved from http://shodhganga.inflibnet.ac.in/bitstream/10603/13544/12/12_chapter%204.pdf

Retrieved from http://shodhganga.inflibnet.ac.in/bitstream/10603/13756/11/11_chapter%203.pdf

Retrieved from http://shodhganga.inflibnet.ac.in/bitstream/10603/3774/14/14_chapter%204.pdf

Retrieved from http://theappentrepreneur.com/mhealth-apps-statistics

Retrieved from http://www.ahujaandahuja.in/category/income-tax-blog/

Retrieved from http://www.arc.gov.in/11threp/ARC_11thReport_Ch4.pdf

Retrieved from http://www.hindustantimes.com/punjab/smart-protest-workers-of-suwidha-centres-leave-withou...

Retrieved from http://www.ijcaonline.org/archives/volume44/number14/6329-8689

Retrieved from http://www.ijhssi.org/papers/v1(1)/Version-2/H115054.pdf

Retrieved from http://www.lenus.ie/hse/bitstream/10147/44920/1/6640.pdf

Retrieved from http://www.martialartstoronto.ca/gosei-yamaguchi-the-constant-innovator/

Retrieved from http://www.stat.columbia.edu/~cook/movabletype/archives/miscellaneous_statistics/

Retrieved from http://www.tribuneindia.com/news/punjab/dcs-suggest-pruning-of-centres-hybrid-model/477024...

Retrieved from https://it.assam.gov.in/about-us/detail/state-e-governance-mission-team-semt

Retrieved from https://mafiadoc.com/impact-assessment-of-e-governance-in-india_59de4daf1723dd73e69ea7f7.h...

Retrieved from https://nrhm-mis.nic.in/PubStateLibrary/Punjab/State%20Fact%20Sheet.pdf

Retrieved from https://www.quora.com/What-are-the-factors-of-production

Retrieved from https://www.quora.com/What-is-the-scope-of-e-Governance

Retrieved from https://www.researchgate.net/publication/264440983_Status_of_e-governance_in_the_state_of_...

*****

FOR PAPER SUBMISSION & CLARIFICATION OR SUGGESTION, EMAIL US @:

editorinchief@pezzottaitejournals.net
contactus@pezzottaitejournals.net

Editor-In-Chief
Pezzottaite Journals
Saraswati Lane, Adjacent Nataraj Dance Academy, Near
Modern Dewan Beverages, Jammu Tawi – 180002,
Jammu and Kashmir, India.
(Mobile): +91-09419216270 – 71