THE "*SIR*" IMPACT OF DEMONETIZATION – MEASURE OF LONG-TERM GROWTH WITH STATISTICAL EVIDENCE

Ms. Yogita Kansal [1] Prof. Radhakumari Challa [2]

[1,2]*Sri Sathya Sai Institute of Higher Learning, Anantapur, Andhra Pradesh (India).*

Abstract:

The concept of demonetization and its contribution to economic growth has become one of the most attractive topics for discussion in all political, academic and other decision-making forums of the current times. The critics of demonetization are absolutely right about the adverse impact of the policy, considering the short-term period. The real impact of demonetization, however, must be weighed in the long-run and not in the short-run. Considering the negative impact of demonetization on the economy is only nominal and short-term, it is necessary to attach statistical substantiation to vouchsafe that the long-term impact of demonetization on the growth of the economy is increasing and sustainable. It is in this context the current research holds its significance. Research is conducted to assess the "SIR" impact of demonetization on Indian Economy. "SIR" stands for Sustainability, Innovation and Rapidity. Accordingly the research is divided into three parts as: "The "SIR" impact of demonetization - statistical evidence testifying the contribution of demonetization to long-term sustainable economic growth in India", "The "SIR" impact of demonetization-Measure of Innovation", "The "SIR" impact of demonetization-Measure of Rapidity of Economic Growth". The first part of the research work is presented in this paper. The present paper gives statistical evidence to show that the latest demonetization move will lead to India's long-term sustainable economic growth. Considering Gross Domestic Product (GDP) as the macroeconomic indicator for measuring the growth of the economy, two-phase statistical analysis was conducted as without the impact of demonetization in the first phase and with the impact of it, in the second phase. The results of the study clearly indicated that the economic growth in India will not only move upwards but also will be sustained at 8.06 % on an average by 2022.

Index terms: Demonetization, GDP, Macroeconomic, .Statistical Evidence, Sustainable, Vouchsafe.

I. INTRODUCTION:

The concept of demonetization and its contribution to economic growth has become one of the most attractive topics for discussion in all political, academic and other decision-making forums of the current times. The critics of demonetization are absolutely right about the adverse short-term impact of the policy. It has caused major inconvenience to a vast majority, particularly to those who have the least financial resources. Of course, it will

shave off some amount of GDP growth for anywhere between a quarter and three to four quarters because of the economic disruption it has caused in different sectors of the economy. According to some critics, this alone is sufficient to damn demonetization. After all, the short-run is all that matters because in the long run we are all dead, as the noted economist Keynes put it. While that proposition may be true for individuals, it certainly is not true for nations. There is also a medium-term which is longer than an electoral cycle or two. Medium-term is certainly longer than a quarter or two but shorter than a generation which runs over 30 or 40 years. India has a very long future, even if individuals do not. The critics of demonetization are absolutely right about the adverse short-term impact of the policy. The real impact of demonetization must be weighed in the medium or long-term run and not in the short-run. Though, it is acknowledged theoretically that the negative impact of demonetization on the economy is only nominal and short-term, at least by some optimists, it is noteworthy that no statistical evidence is given to vouchsafe that the long-term impact of demonetization on the growth of the economy is increasing and sustainable. It is in this context the current research holds its significance.

Research is conducted to assess the **"*SIR*"** impact of demonetization on Indian Economy. "*SIR*" stands for Sustainability, Innovation and Rapidity. Accordingly the research is divided into three parts as: "The "SIR" impact of demonetization - statistical evidence testifying the contribution of demonetization to long-term sustainable economic growth in India", "The "SIR" impact of demonetization-Measure of Innovation", "The "SIR" impact of demonetization-Measure of Rapidity of Economic Growth". The first part of the research work is presented in this paper. The present paper gives statistical evidence to show that the latest demonetization move will lead to India's long-term sustainable economic growth.

II. STATEMENT OF THE PROBLEM:

India's economic progress is at an inflexion point. Twenty five years of liberalization has yielded far superior outcomes for almost every Indian than four and half decades of socialism did. But the gradual opening of markets with substantial government control over the economy also unleashed a virulent strain of crony (and indeed phony) capitalism at about the same time that India grew at its fastest between 2003 and 2012. It is to the credit of the present government that they are able to separate the virtues of capitalism from the pitfalls of the crony capitalism. Thus the expression of minimum government (pro-market) went hand in hand with the rhetoric against black money and illicit wealth accumulation (anti-crony). The reason that opinion polls and anecdotal evidences continue to suggest the popularity of the move despite the obvious hardships, is because it is perceived as a decisive act against those who made their money unscrupulously and then chose to hide it, but not the rich or well-off who earned legitimately and paid their taxes. It is therefore important to put demonetization along with statistical evidence for its contribution to Indian economic growth.

III. OBJECTIVE OF THE STUDY:

The current research is undertaken to prove with statistical evidence that demonetization contributes to sustainable and upward economic growth for India in the long-run. We have considered four important macroeconomic parameters such as Gross Domestic Product (GDP), Gross Value Added (GVA), GDP per capita and Debt to GDP ratio for conducting the statistical analysis to measure the growth performance during

post-demonetization period. In the current research paper we present the methodology, data analysis and interpretation pertaining to one of the above parameters viz GDP alone.

IV. METHODOLOGY:

The methodology for achieving the objective is based on *twin-method analyses*. While the statistical analysis constitutes the first of the twin methods, and the analysis done using the software "*Companion by Minitab*" constituted the second of the twin methods. The statistical analysis conducted as the first step of the *twin-method analyses* is further processed using the Monte Carlo Simulation, an add-in application in excel for reinforcement of the results achieved in the first analysis. The second of the twin-method analysis is done using the "*Companion by Minitab*" software. While the detailed description of the procedure followed for each of these methods is given in our final research report, the first of the twin analysis used for forecasting the GDP and proving that GDP will be sustainable with upward growth for India, in the long-run, is described in the current research paper.

V. STATISTICAL ANALYSIS AS THE FIRST STEP IN TWIN-METHOD ANALYSIS:

Gross Domestic Product (GDP) is one of the important macro-economic indicators that is often used for measuring the growth of an economy. The expenditure method is the most widely used approach for estimating GDP, which is a measure of the economy's output produced within a country's borders irrespective of who owns the means to production. The GDP under this method is calculated by summing up all of the expenditures made on final goods and services. There are four main aggregate expenditures that go into calculating GDP: consumption by households, investment by businesses, government spending on goods and services, and net exports, which are equal to exports minus imports of goods and services. Considering the four components used for estimating the GDP, the data about which is available at the secondary source, statistical analysis is conducted using time-series forecasting technique in Microsoft Excel. The data thus gathered, has been passed through time-series technique to de-seasonalise and avoid cyclical and other irregular factors. Moving average technique has been used for de-seasonalising the data. For deciding on the period of moving average, the data pertaining to each parameter has been graphed and the period corresponding to the change of trend is observed and is taken as the basis for selecting the moving average period. The data thus de-seasonalised, has been further purified with the removal of other cyclical and irregular factors.
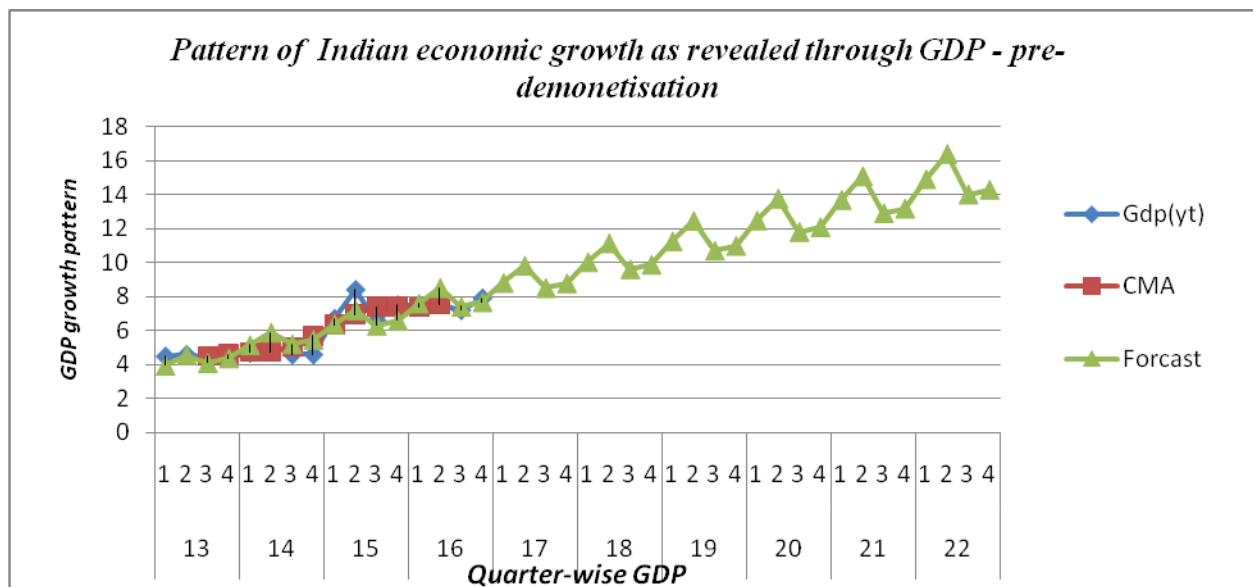
After removing the seasonal, cyclical and other irregular factors that influence the data in the short-period of time, the data has been additionally regressed with time to check on their relationship, employing the simple linear regression technique taking the de-seasonalised GDP data as the dependent variable (Y) and the time (X) as the independent variable. The Y- intercept and the coefficient of X variable are calculated. Using the X and Y values thus calculated and multiplying with the unit of time, the trend values are computed. Finally the computed trend values are multiplied with the cyclical trend numbers to arrive at the forecasted values which are devoid of all the short-term seasonal, cyclical and other irregular factors. Thus the forecasted values represent

the long-term growth rates of the economy. The average of the thus forecasted values represents the actual growth of the economy in the long-run. The forecasted growth rates of GDP are further simulated with the help of Monte Carlo Simulation technique to additionally testify that the forecasted values will make the growth factor sustainable and push the growth upwards, if the current economic scenario remains unchanged. The statistical analysis described above has been done in two phases as elaborated below:

First Phase: Forecasting the Growth Rates without the impact of demonetization:

In the first phase the growth rates are forecasted till 2022, taking the growth rates predicted by the Ministry of Statistics and Programme implementation (MoSPI), Govt. of India, 2011-12 at constant prices as the basis. The impact of demonetization on the economic growth was ignored in this **ro**und of forecasting and analysis. The results of the analysis thus represent the forecasted growth rates without the impact of demonetization and are shown in the following figure 1-a:

 Fig-1(a)-Forecasted Pattern of GDP Pre-demonetization

Second Phase : Forecasting Growth Rates with the impact of demonetization:

In the second phase using the growth rates predicted by the Ministry of Statistics and Programme implementation MoSPI, Govt. of India till 2016-17 as the basis, we took forecasting forward for six subsequent years i.e. till 2022 which gave us the de-seasonalised forecasted values for the growth rates. Needless to mention that the growth rates given by the Ministry incorporated the impact of demonetization. The forecasted values thus given by Average Analysis and the respective graphs are compared for the trend in the growth and the trend in the change in the growth rates predicted for both pre and post demonetisaton periods.

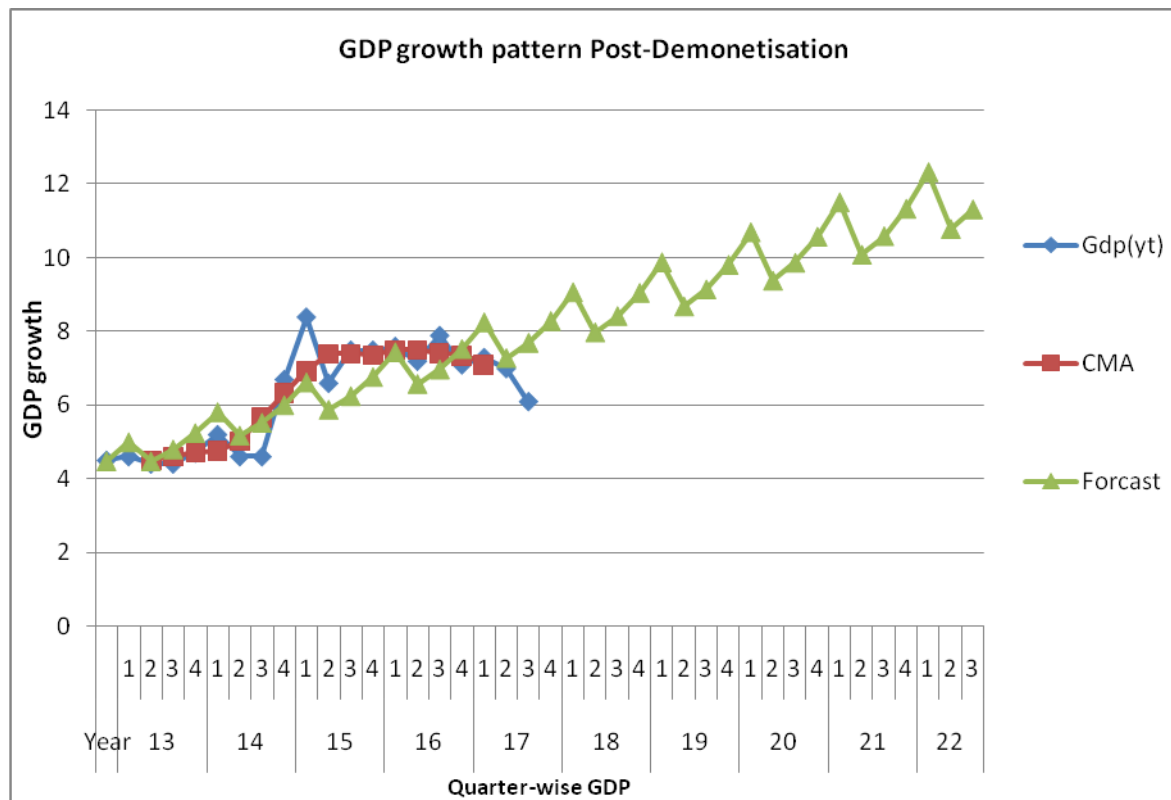**Application of Monte Carlo Simulation using excel**:

A Monte Carlo simulation is a quantitative analysis that accounts for the risk and uncertainty of a system by including the variability in the inputs. The system may be a new product, manufacturing line, finance and business activities, and so on. The simulation uses a mathematical model of the system, which allows exploring

the behavior of the system faster, cheaper, and possibly even safer than experimented on the real system. Whenever we need to make an estimate, forecast or decision where there is significant uncertainty, we consider Monte Carlo simulation, if we do not want the estimates or forecasts go way off the mark, with adverse consequences for future decisions. As a part of application of Monte Carlo Simulation, the mean and standard deviation of the forecasted values relating to the above two phases are computed and simulated six times as 1000 iterations in each simulation, using the Monte Carlo Technique in Excel. Further the mean and standard deviation of each of these simulated values are computed and graphed to understand the pattern of the growth.
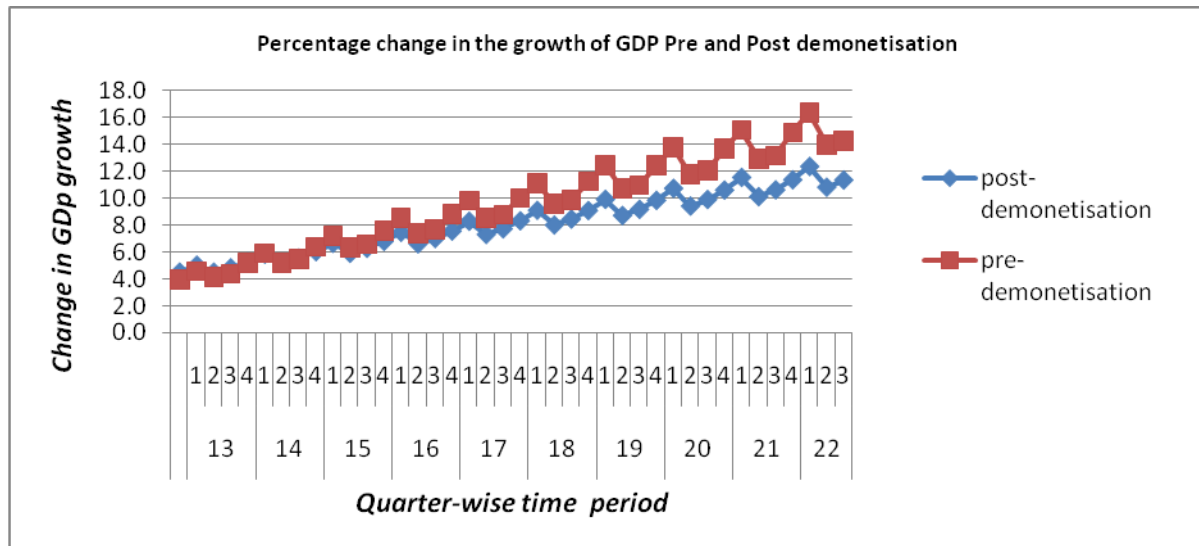
VI. DATA ANALYSIS AND INTERPRETATION:

The study proves statistically that demonetization will contribute to sustainable economic growth for India, in the long-run. Accordingly this statistical evidence indicates that the impact of demonetization on the Indian economy is only a short-term shock. Using GDP as one of the macro economic factors, statistical analysis is conducted. The twin-statistical analysis was conducted as per the methodology described in the previous section. As per the first step, the analysis was conducted using GDP, without considering demonetization impact. The five year forecasted values of GDP from 2018 to 2022. **The upward direction in the growth also reflects the sustainability where the growth is sustained at 9.57 percentage on an average per annum.** This average represents the grand mean of the annually forecasted values. This process was repeated for post demonetization period in the second step as mentioned in the methodology. The trend in the GDP growth is noticed moving upward for the same period. **The sustainability is retained at 8.06 percentage of annual growth on an average during post demonetization** as depicted in Figure 1-b.
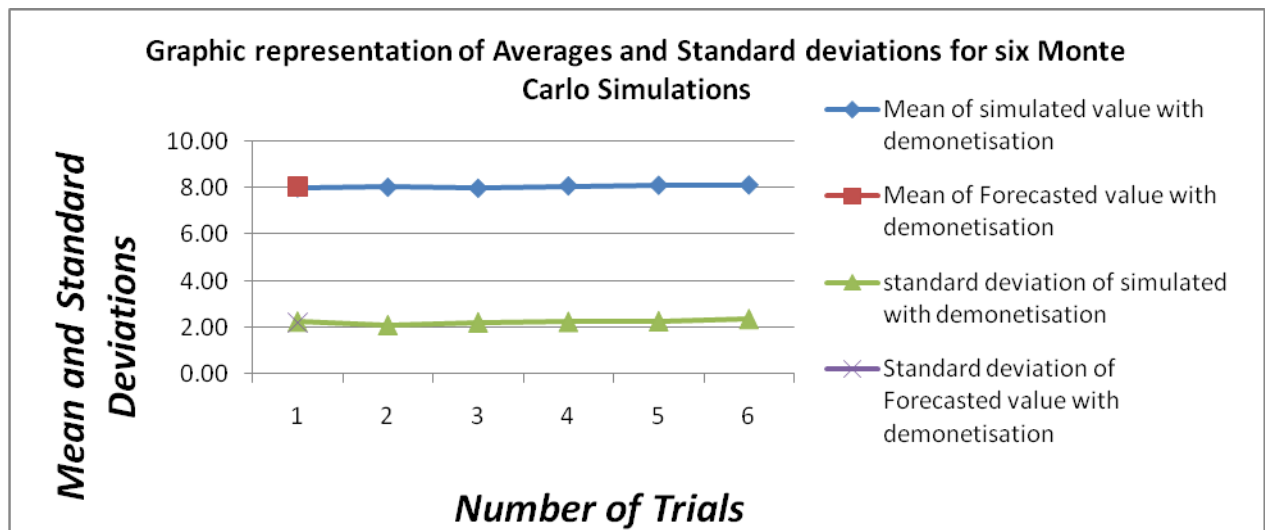
Fig-1(b): Pattern of GDP post-demonetization

Comparative analysis of the forecasted values of GDP pertaining to both periods i.e. pre and post demonetization reveals that the trend in GDP growth is noticed moving upward, as is seen in Figure 1-c.

Fig 1 -(c): Pattern of growth in GDP – pre and post demonetization

These results are further supported by the test outcome of the Monte Carlo Simulation done using MS excel. The mean and standard deviation of deseasonalised forecasted values relating to the above two phases are computed and simulated six times as 1000 iterations in each simulation, using the Monte Carlo Technique in Excel. The mean and standard deviation of these simulated values are computed and presented in figure 1-d. The pattern of the graph not only indicates the high reliability of the means but also reflect on the steadiness in the growth which is sustainable.

Fig 1-d: Graphic representation of means and standard deviations of simulation results

VII. CRITICAL SUCCESS FACTORS:

The following factors besides many others, contributed to the successful laying of strong and sustainable foundation for the edifice of economic growth in India, during post-demonetization scenario:

- Massive block to black money: In June last year, news agency PTI reported, quoting the findings of Ambit Capital Research, that about Rs 30 lakh crore or 20 per cent of the GDP constitutes India's 'black economy'.

The same report said that about 30 per cent of real estate and construction sector is funded by black money. Recently, the Business Standard too, reported that construction and mining are among 11 sectors generated more unaccounted money than others. Clearly, the contraction in construction and some such sectors shows that demonetization massively blocked black money funding of the sectors.

- Tightening the noose around cash hoarders: With the thinning of cash dependency, many of the cash-dependent small businesses were forced to leveraging the technology and fall in the digitalization path that helped   them have better foundation for future growth, though few of the inefficient ones had to look for alternative means of living.

- Tough and historic measures taken: Measure such as GST and Demonetisation were boldly taken for the long-term benefit of the economy.

- Launching of Schemes for creation of employment and entrepreneurial opportunities: To assure generation of employment opportunities and tap entrepreneurial innovation various ground-breaking and pioneering schemes were launched which are already showing the results of the first crop. Besides, 87 reforms were made in 21 sectors in 3 years.

- Making fundamental economy strong: Every effort are diverted for making the basic change for the strong future building.

- Scraping of Shell companies: Another daring step of scraping the shell companies not only is streamlining the business starting procedures among the individuals but also paving the way for inculcation of value system in the individuals.

- Flexible approach: The flexible approach in implementing the reforms such as GST with willingness to fine tuning the rates after a comprehensive review; and removing the bottlenecks whenever necessary is also a critical success factor for Indian economic growth.

VIII. SUGGESTION

If involvement of non-political economists and great academicians from various reputed educational institutions in policy formulation; and for overseeing the implementation of policies, can be considered, even at informal level, achievement of the vision set for each scheme could be faster than expected.

IX. CONCLUSION

As per the current research India's economic growth in terms of GDP will sustain at 8.6 % from 2018 onwards, if supported by the currently contemplated government's reform and review measures. The results of our study are also complemented by the prediction of Moodys, which puts the GDP growth at 8 percent rate in about three to four years.

In the end, assuring that the negative impact of demonetization on the economy is limited in size and duration, we conclude with great confidence that the demonetization exercise is a gallant decision taken, for achieving the great vision of new India.

X. ACKNOWLEDGEMENTS:

REFERENCES:

[1] Nithin Kumar A and Sharmila (2016). Demonetization and Its Impact on Indian E-conomy. International Journal of Humanities, Arts, Medicine and Science. ISSN (P):2348-0521. ISSN (E): 2454-4728. Vol. 4. Issue12, Dec 2016. Pp 23-26.

[2] Dr. Pratap Singh and Virender Singh (2016). Impact of Demonetization on Indian Economy. International Journal of Science Technology and Management. ISSN (O) 2394-1537. ISSN (P) 2394-1529. Vol. No.5, Issue No. 12, December 2016.

[3] S Vijay Kumar and T Shiva Kumar (2016). Demonetization and Complete Financial Inclusion. International Journal of Management Research & Review. ISSN: 2249-7196. Volume 6. Issue 12.

[4] Nikita Gajjar (2016). Black Money in India: Present Status and Future Challenges and Demonetization. International Journal of Advance Research in Computer Science and Management Studies. ISSN:2321-7782. Volume 4, Issue 12, December 2016.

[5] Office of the Development Commissioner (2016). Demonetization and Promoting use of digital payment system.

[6] Economic Consequences of demonetization of Rs. 500 and Rs. 1000 notes. (2016). Care Ratings: Professional Risk Opinion.

[7] Lokesh Uke (2017). Demonetization and its effects in India. SSRG International Journal of Economics and Management Studies. Volume 4. Issue 2. February 2017.

[8] Dr. Sweta Singhal (2017). Demonetization and E-Banking in India. International Journal of New Technology and Research (IJNTR). ISSN: 2454-4116. Volume3. Issue1. January 2017. Pp 20-25.

[9] Manpreet Kaur (2017). Demonetization: Impact on Cashless payment system. International Conference on Recent Trends in Engineering, Science and Management. ISBN:978-93-86171-21-4. 8th January, 2017.

[10]Tax Research Team(14-Nov-2016 NIPFP Working paper series) No.182

[11] Team, BS Web (7 December 2016). "Several BJP men caught with crores; Karnataka biggest hotspot for illegal cash transactions" – via Business Standard.