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Empirical study on the impact of demonetization on the profitability of Tata motors and DLF India

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Abstract
The Indian government announced the demonetization on 8th November 2016 effective from 9th November 2016 which makes the legal validity of all Rs. 500 and Rs. 1000 bank notes obsolete. The main objective of the government behind this drastic decision is to suppress the face of corruption and parallel economy in the country. It has been reported by RBI that 99.3% of the targeted bank notes, worth Rs 15.30 lakh crore has been returned to the banking system. Experts consider this data as a basis to opine that government's attempt to give a massive blow to the parallel economy is not so fatal. Though many experts of the banking field termed the decision as bold and good, later on it has been realized that due to this hurried decision; Indian economy suffered a financial crisis which impacted the overall growth. The prime reason for it is, extreme prolonged cash shortages and that impacted industries, organizations and other economic avenues seriously. Due to all these factors, later on merits of the decision has been questioned from several corners of the world. Decision has been basically proclaimed as hurried and unplanned. The Automobile sector, Real-estate sector, MSMEs and some other key sectors reflected a huge impact by this decision as observed practically and from various reports and articles. Researchers here conducted parametric test to observe whether demonetization has any significant impact on the profitability of the two companies. It has been observed based on the required tests that there is significant impact of demonetization on certain profitability parameter of Tata Motors while the profitability parameters of DLF India reflect no impact of demonetization. The researcher also tries to highlight the reasons for significant or insignificant impact of demonetization on the profitability parameters of above two companies.

Keywords: Demonetization, financial crisis, parallel economy, parametric test & profitability parameters, JEL Classification, C12, C14, C87, C88, L 62, L85, Y10

1. Introduction
Demonetization is the act of stripping a currency unit of its status as legal tender. It occurs whenever there is a change of currency. The current form or forms of money is pulled from circulation and retired, often to be replaced with new notes or coins. Sometimes, a country completely replaces the old currency with new currency (Source: Investopedia). So, we can say that it is process by which authority like Government or Reserve Bank of India (RBI) can eradicate the old currency by introducing a new one. The rationality behind this process are - to eliminate counterfeit currency and dodgy funds which have been used by terror groups to fund terrorism in India, to fight against tax evasion, to combat for eliminating black money and try to promote a cashless economy. The citizens of India have faced three times the phases of demonetization like in 1946 when the RBI demonetized Rs, 1,000 and Rs, 10,000 notes, in 1978, when the Government demonetized Rs, 1,000, Rs. 5,000, and Rs. 10,000 notes and lastly on November 8, 2016, the Prime Minister Narendra Modi announced the demonetization of the currency notes of Rs. 500 and Rs, 1,000. Some people refer that the last demonetization as a surgical strike against black money and corruption whereas some people argue that it is masterstroke towards a cashless economy. Due to demonetization daily routine of people has changed for sudden decline in money supply as well as different sectors are getting affected, such as service, real estate, automobiles, Infrastructure, Pharmaceutical, Consumer durables, Manufacturing and also banking sector. The common people, different industrialist and economists have had different opinion on the impact of demonetization. Few of them are worried about the negative growth rates of different sector as well as slow economic growth rate in short -term period where as some people feel that the effect will be positive and sustainable. Two major industries namely Automobiles and Real estate have been considered for the study.

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2. Justification of the Study

Demonetization is not a common phenomenon for any developing economy. In India it had happened in the year of 2016 after a long gap of almost 40 years. Obviously there will be some impact on different sectors in a different ways. Ten sectors in India were majorly impacted by demonetization: Agriculture, Real Estate, Construction, Manufacturing, Financial, Aviation, Tourism and Hospitality, Telecom, Healthcare and Automobile. The worst affected sectors are being Financial, Real Estate, Construction, Tourism and Hospitality (sources: Chadha, Sharma). Out of these sectors the researchers aim to analyse the impact of demonetization on two key sectors, Real-estate and automobile sector. It is observed from different journals, newspapers or reports released by Central Statistics Office (CSO), Ministry of Statistics and Programme Implementation that the impact of demonetization on real estate is much higher as compared to any other sector due to the involvement of black money and cash transactions in this sector much more than other sectors. Real estate sector in India is expected to reach a market size of US$ 1 trillion by 2030 from US$ 120 billion in 2017 and contribute 13 per cent of the country's GDP by 2025 (www.ibef.org). Any impact on real estate sector will greatly affect the entire economy. After demonetization there were a lot of changes happened in the real estate sector.On the other hand, the automobile industry is an important driver of the economic growth in India and one of the successful sectors in which the country has high participation in global value chains. This sector of India is one of the largest sectors in the world and accounts for over 7.1% of India's gross domestic product (GDP). It also contributes to nearly 22% of the country's manufacturing GDP (http://www.investindia.gov.in/automobile-sector/). So, the researchers have taken two companies (namely Tata Motors and DLF India) representing these two sectors to investigate that whether there is an impact of last demonetization on their performance.

3. Literature Review

In this section, the researchers made an attempt to review the different aspect of demonetization. The different studies conducted by the research, scholars and experts were reviewed for the identification of the research gap.

Banerjee and Chatterjee (2016), discussed in a blog about the significant and immediate impact of demonetarization on the Indian economy and tried to highlight the impact on Automobile and Real-Estate sector. Their study also concluded that reduction in liquidity causes a sharp decline in the availability of disposable income and that's why both the sectors are expected to be adversely affected.

Katke *et al.* (2017) [6], in their study reflects the impact of demonetization on sales and consumer behavior of Car Industry. It focused on short term result only. It concluded that socio-economic factors are determinants for car purchase. Demonetization not only posed economic problem but also penetrated psychological fear.

Chaudhary (2017) [4], analysed regarding the ground reality and how demonetization had impacted the different sectors of Indian economy. The study revealed that the different sectors like 1.Auto & Auto Ancillary, 2. Consumption, 3.Banking, 4.Hospitality and tourism, 5.Oil & Gas and 6.

Real Estate were influenced in positive, negative or in neutral manner. S. Singh (2017) [9], focused on the effect of demonetization on different sectors of Indian economy. He highlights that due to demonetization the GDP of the country slightly decreases in comparison with previous periods, are short run effects. All the negative impact will be solved with the introduction of new currency notes.

Kumar and Kumar (2017) [11] conducted a study to analyze the effect of demonetization in real estate sector in Bengaluru. The study reflects that due to demonetization the market price falls by 7.6%, 10% drop in supply of new owner for properties for sale and between 5 to 10 percentages of buyers have shifted from "buying" to now "renting. Bhagwat *et al.* (2018) [3], in their study elucidates the effect of demonetization on Real estate sector. This paper reflects that demonetization did not primarily have a significant effect on the real estate sector, because of existing slump in this sector; as this sector is already in a bad shape. Raval (2019) [7], the study was conducted to analyse in detail- to observe pre and post effects of demonetization. The study elucidates that the automobile sector saw a short term impact where the purchases were delayed due to scarcity of funds, but was neutral for purchase financing or banked cash.

4. Research Gap

Based on the above extensive review of literature; it has been observed by the researchers that literature lacks any definite study on the impact of demonetization on the profit before tax and total revenue of the Tata Motors and DLF India. The gaining of knowledge regarding the impact of demonetization on these two profitability parameters is an important area of study at present. The social implication of this study is also huge. The understanding of the impact of demonetization on the profitability parameters, especially profit before tax and total revenue has high socio-economic significance. It will help to know how economy through its industries is being impacted by demonetization, as profitability parameters are vital determinants of sectoral or industrial health.

5. Research Objectives

The study is based on the following research objectives:
1. To verify whether total quarterly revenue and Profit before Tax of Tata Motors are significantly impacted by demonetization.
2. To verify whether total quarterly income and Profit before Tax of DLF India are significantly impacted by demonetization.

6. Research Questions

Based on the above research objectives, the following research questions have been derived.
1. Whether total quarterly revenue of Tata Motors is affected by demonetization?
2. Whether Profit before Tax of Tata Motors is affected by demonetization?
3. Whether total quarterly income of DLF India is affected by demonetization?
4. Whether Profit before Tax of DLF India is affected by demonetization?

7. Research Hypothesis

Following research hypothesis has been derived based on the above research questions.

1. Null Hypothesis (H_{01}): There is no significant impact of demonetization on total quarterly revenue of Tata Motors Ltd.
2. Null Hypothesis (H_{02}): There is no significant impact of demonetization on quarterly Profit Before Tax of Tata Motors Ltd.
3. Null Hypothesis (H_{03}): There is no significant impact of demonetization on total quarterly Income of DLF India.
4. Null Hypothesis (H_{04}): There is no significant impact of demonetization on the quarterly Profit before Tax of DLF India.

8. Research Methodology

Demonetization came into effect from November 09, 2016. This government decision for scrapping out, then existing Rs. 500 and Rs. 1000 notes was very much topic of debate among many socialists, economists, academicians, politicians and other stakeholders of the society.

Researchers try to analyse the impact of such decision of the government (i.e. demonetization) on the two companies, of two different sectors. For this study, we consider Tata Motors from the automobile sector and DLF India from the real estate sector. These two sectors were in lime light during the phase of demonetization. Our literature review also justifies that these two sectors reflect a high impact of the government decision.

Tata Motors and DLF India form an important part of the two sectors that are considered for this study. Tata Motors has a large and diversified market share in the automobile sector as it has commercial vehicles, private vehicles, and heavy load vehicles in their product line. DLF India has a huge market share in the real estate sector. Both the companies under research are among the top performers of their respective sectors.

The research is based on the secondary data obtained from the quarterly reports of the two companies under discussion. The researchers consider 8 quarterly reports both pre and post demonetization for analyzing the impact of the decision. However, Q3 (October -December) of 2016-17 financial year has been excluded from the period of study as demonetization came into effect from the middle of the quarter (i.e. November 09, 2016). The impact has been judged in terms of two profitability parameters, quarterly revenue/income and Profit before Tax. The above period has been selected to best understand the impact. The hypothesis has been tested using required test in jamovi (1.2.25), based on the test results the discussions, conclusions and recommendations are suggested and limitations and future research scope has been highlighted.

9. Data presentation and Analysis

Table 1: Quarterly revenue of Tata Motors Ltd. (Rs. in Crore)

Years Category	2014-15(Q3)	2014-15(Q4)	2015-16(Q1)	2015-16(Q2)	2015-16(Q3)	2015-16(Q4)	2016-17(Q1)	2016-17(Q2)
Pre Demonetization	9,056	10,784	9,297	10,501	10,001	12,570	11,465	11,406
Years Category	2016-17(Q4)	2017-18(Q1)	2017-18(Q2)	2017-18(Q3)	2017-18(Q4)	2018-19(Q1)	2018-19(Q2)	2018-19(Q3)
Post Demonetization	13,621	9,207	13,400	16,102	19779	16,803	17,759	16,208

Source: Quarterly Financial Statements of Tata Motors Ltd.

Null Hypothesis (H_{01}): There is no significant impact of demonetization on Total quarterly revenue of Tata Motors Ltd. Analysis

Table 2: Correlation Matrix

Pre Demonetization Quaterly Revenue			Post Demonetization Quaterly Revenue
Pre Demonetization Quarterly Revenue	Pearson's r	—	
	p-value	—	
Post Demonetization Quarterly Revenue	Pearson's r	0.261	—
	p-value	0.532	—
Note. * $p <.05$, ** $p <.01$, *** $p <.001$			

Source: jamovi (1.2.25)

There exists no significant correlation between post and pre demonetization quarterly revenue; as indicated by the P value of .532 ($P >.050$). Hence cannot be considered as a paired data.

Table 3: Normality Test (Shapiro-Wilk)

	W	p
Quarterly Revenue	0.936	0.303

Note: A low p-value suggests a violation of the assumption of normality
Source: jamovi (1.2.25)

Both the samples are from normal populations as evidenced from P value of .303 ($P>.050$).

Table 4: Homogeneity of Variances Test (Levene's)

	F	df	df2	p
Quarterly Revenue	4.79	1	14	0.046
Note. A low p-value suggests a violation of the assumption of equal variances				

Source: jamovi (1.2.25)

The assumption of equal variances fails as null hypothesis is being rejected at a P value of.046 ($P<.050$).

Hence Welch's t test is being done to test the hypothesis.

Table 5: Independent Samples T-Test

		Statistic	**df**	**p**
Quarterly Revenue	Welch's t	-3.88	8.83	0.004

Source: *jamovi (1.2.25)*

As per above observation in table 4 it can be concluded that their lies statistically significant difference in pre and post demonetization quarterly revenue of Tata Motors at 95% confidence level, with a P value of.004 ($P<.050$).

Table 6: Group Descriptives

	Group	**N**	**Mean**	**Median**	**SD**	**SE**
Quaterly Revenue	Pre Demonetization	8	10635	10643	1180	417
	Post Demonetization	8	15360	16155	3237	1145

Source: *jamovi (1.2.25)*

Above table 5 also indicated that Post demonetization performance (Mean = 15360) is statistically significantly better than Pre demonetization (Mean = 10635) performance.

Table 7: Quarterly Profit before Tax for Tata Motors Ltd. (Rs. in Crore)

Years Category	2014-15(Q3)	2014-15(Q4)	2015-16(Q1)	2015-16(Q2)	2015-16(Q3)	2015-16(Q4)	2016-17(Q1)	2016-17(Q2)
Pre Demonetization	(2,105)	(1,156)	269	(285)	(203)	370	38	(609)
Years Category	2016-17(Q4)	2017-18(Q1)	2017-18(Q2)	2017-18(Q3)	2017-18(Q4)	2018-19(Q1)	2018-19(Q2)	2018-19(Q3)
Post Demonetization	(818)	(467)	(266)	201	(474)	1,464	150	519

Source: Quarterly Financial Statements of Tata Motors Ltd.

Null Hypothesis (H$_{02}$): There is no significant impact of demonetization on Quarterly Profit Before Tax of Tata Motors Ltd.

Table 8: Correlation Matrix

		Pre Demonetization	**Post Demonetization**
Pre Demonetization	Pearson's r	—	
	p-value	—	
	N	—	
Post Demonetization	Pearson's r	0.624	—
	p-value	0.099	—
	N	8	—

Source: *jamovi (1.2.25)*
Note: * $p <.05$, ** $p <.01$, *** $p <.001$

There exists no significant correlation between post and pre demonetization quarterly Profit before Tax; as indicated by the P value of.099 ($P >.050$). Hence cannot be considered as a paired data.

Table 9: Normality Test (Shapiro-Wilk)

	W	**p**
Quarterly Profit Before Tax	0.986	0.994

Source: *jamovi (1.2.25)*
Note: A low p-value suggests a violation of the assumption of normality

Both the samples are from normal populations as evidenced from P value of.994 ($P>.050$).

Table 10: Homogeneity of Variances Test (Levene's)

	F	**df**	**df2**	**p**
Quarterly Profit Before Tax	0.114	1	14	0.741

Source: *jamovi (1.2.25)*
Note: A low p-value suggests a violation of the assumption of equal variances

The assumption of equal variances holds as null hypothesis is being accepted at a P value of.741 ($P>.050$).

Hence Student's t test is being used to test the hypothesis.

Table 11: Independent Samples T-Test

		Statistic	df	p
Quarterly Profit Before Tax	Student's t	-1.29	14.0	0.219

Source: *jamovi (1.2.25)*

As per above observation in table 11 it can be concluded that their lies no statistically significant difference in pre and post demonetization quarterly Profit before Tax of Tata Motors at 95% confidence level, with a P value of.219 ($P>.050$).

Table 12: Quarterly Income from Operations for DLF India (Rs. in Crore)

Years Category	2014-15(Q3)	2014-15(Q4)	2015-16(Q1)	2015-16(Q2)	2015-16(Q3)	2015-16(Q4)	2016-17(Q1)	2016-17(Q2)
Pre Demonetization	864	817.86	373.16	868.73	75.78	1133.87	676.17	730.56
Years Category	2016-17(Q4)	2017-18(Q1)	2017-18(Q2)	2017-18(Q3)	2017-18(Q4)	2018-19(Q1)	2018-19(Q2)	2018-19(Q3)
Post Demonetization	1416.97	1080.08	534.22	829.05	1360.44	449.23	1179.94	1043.94

Source: Quarterly Financial Statements of DLF India.

Null Hypothesis (H_{03}): There is no significant impact of demonetization on Total quarterly Income of DLF India Analysis

Table 13: Correlation Matrix

		Pre Demonetization	Post Demonetization
Pre Demonetization	Pearson's r	—	
	p-value	—	
	N	—	
Post Demonetization	Pearson's r	-0.529	—
	p-value	0.177	—
	N	8	—

Source: *jamovi (1.2.25)*
Note: * $p <.05$, ** $p <.01$, *** $p <.001$

There exists no significant correlation between post and pre demonetization quarterly income; as indicated by the P value of.177 ($P >.050$). Hence cannot be considered as a paired data.

Table 14: Normality Test (Shapiro-Wilk)

	W	p
Quarterly Income	0.943	0.388

Source: *jamovi (1.2.25)*
Note: A low p-value suggests a violation of the assumption of normality

Both the samples are from normal populations as evidenced from P value of.388 ($P>.050$).

Table 15: Homogeneity of Variances Test (Levene's)

	F	df	df2	p
Quarterly Income	0.526	1	14	0.480

Source: *jamovi (1.2.25)*
Note: A low p-value suggests a violation of the assumption of equal variances

The assumption of equal variances holds as null hypothesis is being accepted at a P value of.480 ($P>.050$). Hence Student's t test is being used to test the hypothesis.

Table 16: Independent Samples T-Test

		Statistic	df	p
Quarterly Income	Student's t	-0.982	14.0	0.343

Source: jamovi (1.2.25)

As per above table 16 it can be concluded that their lies no statistically significant difference in pre and post demonetization quarterly income of DLF India at 95% confidence level, with a P value of. 343 ($P>.050$).

Table 17: Quarterly Profit Before Tax for DLF India (Rs. in Crore)

Years Category	2014-15(Q3)	2014-15(Q4)	2015-16(Q1)	2015-16(Q2)	2015-16(Q3)	2015-16(Q4)	2016-17(Q1)	2016-17(Q2)
Pre Demonetization	226.82	552.95	(165.77)	346.06	(421.81)	1210.43	91.48	157.53
Years Category	2016-17(Q4)	2017-18(Q1)	2017-18(Q2)	2017-18(Q3)	2017-18(Q4)	2018-19(Q1)	2018-19(Q2)	2018-19(Q3)

| Post Demonetization | 374.53 | 276.49 | (66.13) | (113.06) | 448.15 | (46.52) | 348.53 | 289.78 |

Source: Quarterly Financial Statements of DLF India.

Null Hypothesis (H04): There is no significant impact of demonetization on the profit before tax of DLF India.
Analysis

Table 18: Correlation Matrix

		Pre Demonetization	Post Demonetization
Pre Demonetization	Pearson's r	—	
	p-value	—	
	N	—	
Post Demonetization	Pearson's r	-0.433	—
	p-value	0.283	—
	N	8	—

Source: *jamovi (1.2.25)*
Note: * *p* <.05, ** *p* <.01, *** *p* <.001

There exists no significant correlation between post and pre demonetization quarterly profit before tax; as indicated by the P value of.283 (P >.050). Hence cannot be considered as a paired data.

Table 19: Normality Test (Shapiro-Wilk)

	W	p
Profit Before Tax	0.941	0.366

Source: *jamovi (1.2.25)*
Note: A low p-value suggests a violation of the assumption of normality

Both the samples are from normal populations as evidenced from P value of.366 (P>.050).

Table 20: Homogeneity of Variances Test (Levene's)

	F	df	df2	p
Profit Before Tax	1.41	1	14	0.255

Source: jamovi (1.2.25)
Note: A low p-value suggests a violation of the assumption of equal variances

The assumption of equal variances holds as null hypothesis is being accepted at a P value of.255 (P>.050). Hence Student's t test is being used to test the hypothesis.

Table 21: Independent Samples T-Test

Profit Before Tax		Statistic	df	p
Profit Before Tax	Student's t	0.318	14.0	0.755

Source: jamovi (1.2.25)

As per above table 21 it can be concluded that their lies no statistically significant difference in pre and post demonetization quarterly Profit before tax of DLF India at 95% confidence level, with P value of.755 (P>.755).

10. Conclusion

1. The total quarterly revenue of Tata Motors is statistically significantly impacted by demonetization. The total quarterly revenue of the company increased after the demonetization. The most probable cause can be, a large number of people and organizations having huge amount of liquid cashes try to get rid of it by purchasing vehicles. Due to high chance of possible low down in sales volume in India, Tata Motors takes special measures for sales promotion in the foreign markets, which works to a great extant. Many vehicle dealers of urban and especially of sub-urban areas spent huge cash on advertising and also allowed high discount on cash purchase of cars for some period after demonetization. Tata Motors has a diversified product line with a wide price range and have multinational presence, so it can easily control the situation to a high extant that has suddenly arise in the country. The Profit before tax of Tata Motors is not at all statistically significantly impacted by the demonetization. Thus, the higher revenue did not ensure higher Profit before tax. The most Probable cause can be; increase in operational cost due to shortage in supply of various raw materials. Raw materials are basically procured from MSMEs of the country and they mainly transact in liquid cash. Operational capability of those MSMEs is seriously affected due to demonetization and many MSMEs stop their activity for some period.

2. The total quarterly income and Profit before tax of DLF India is not at all statistically significantly impacted by demonetization. It has been put forward by various reports and articles that real estate sector is severely affected by demonetization, as the promoters who are an important part of both demand and supply side of the sector mainly deals in liquid cash. They face a severe impact by demonetization due to cash shortage in purchase of raw materials and immovable properties.

The scenario is totally different for DLF India, their sale transactions are mainly non-cash and they do not maintain a huge balance in liquid cash like normal promoters to avoid tax. On other side, the DLF India sold their properties mainly to direct consumers who preferably deal in cheque and drafts or NEFT or RTGS. For this both demand side and supply side of the DLF India was not significantly impacted by demonetization.

11. Recommendations
This acute problem of cash shortages in future should be tackled. Thus, it is very important for every organization whether small or large to go cash less and maintain balances in bank accounts and maintains liquid cash as less as required. There are various costs associated with the maintenance of liquid cash. Modern banking technologies are supporting to a great extent, the use of non-cash mode of transactions. The use of liquid cash increases the chances of creation black money and tax evasion. These things force government to take drastic actions. So, to avoid these challenging scenarios economy need to be leaner towards using payment apps and net banking.

12. Limitations and future research scope
The most important limitation of the study is that it does not quantify the impact of demonetization on the parameters considered for the two companies. Quantification is necessary, as several factors can impact the above parameters. The research is also based on some parameters of selected companies from some selected sectors. These limitations can be taken care off through more wide and in-depth research in this area. Primary survey can be used to understand the impact of demonetization and the impact can be quantified. The more sophisticated statistical tools can be used here for more better and diversified understanding of various research objectives. More over larger no of parameters and companies can be considered and more sectors and quarters can be included under study, for more better and comprehensive results.

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