Measuring demonetisation: a path towards the cashless India

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Abstract: The objective of the paper is to analyse the immediate impact of demonetisation on the Indian economy along with analysing the barriers in moving towards cashless economy and investigates the influence of demonetisation towards cashless economy. Scale was constructed for measuring effectiveness and impact of demonetisation on Indian economy. The responses were asked only from the people who were earning an income from any source. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted on respondents followed by the structural equation modelling and path analysis. Results suggested that demonetisation’s main motive was to lay the path for cashless India. It was also concluded that IT enabled services, payment portals are the major gainers during this phase and traditional banking was negatively impacted by demonetisation. Impact on social issues has also been observed as there is reduction in black money, more disclosure of income, more transparent business dealings, less holding of huge amounts of cash in hand and others. There has also been an indirect effect on cashless economy via economic concerns from the demonetisation.
Keywords: confirmatory factor analysis; CFA; SEM; scale; cashless economy; black money; payment portals; social issues; India.


Biographical notes: Kritika Nagdev is a Research Scholar at Amity University and an Assistant Professor at Vivekananda Institute of Professional Studies, Delhi and has got five years of experience in academia and industry. She is a research and analytics enthusiast. Her research interest is in the area of digital organisational designs that enhances customer relationships.

Parul Kumar is presently working as an Assistant Professor at Maharaja Agrasen Institute of Management Studies. She has an experience of 8+ years in imparting the knowledge of finance, statistics and data analytics. She has recently submitted her thesis on impact of FPI inflows on the stock market returns of NSE at IGNOU. She has published over nine research papers in reputed journals and 12 papers in various national and international conferences. Her area of specialisation is data analytics, financial markets, foreign portfolio investors and modelling. She holds 15 certifications of Pennsylvania University, Rice University, University of Colorado Boulder, John Hopkins and University of California, Davis. These certifications relate to predictive modelling, advance analytics, R programming, advance excel, tableau and data analytics.

Anupama Rajesh has written more than 20 research papers and case studies for prestigious international journals and has five books and several book chapters to her credit. She is a reviewer for renowned Sage and Emerald journals and is the Editor of ‘Anukriti’ – The Amity Business School Magazine.

Sunil Kumar is presently working as an Associate Professor at IGNOU. He has 18 years of rich teaching experience at post graduations and graduation level. He has over 133 publications in various national and international conferences. Also, four of his publications are in reputed journals. His area of specialisation is finance and taxation. He frequently delivers lectures on taxation and accounting – live telecast on DD-National Channel (GYAN DARSHAN) at Indira Gandhi National Open University (IGNOU). He is a member of the panel of examiners of Institute of Chartered Accountants of India, Institute of Cost and Works Accountants of India and Institute of Company Secretaries of India.

1 Introduction

On November 8, 2016, Honorable Narendra Modi led government announced an historic move to invalidate more than 85% of cash in circulation of Indian economy. The two largest currency notes, `500 and `1,000, were ‘demonetised’ with immediate effect, ceasing to be legal tender apart from a few specified purposes till a specific deadline. These notes were to be deposited in the banks by December 30, 2016, while restrictions were placed on cash withdrawals. The aim of the action was multi fold: counterfeiting
terror funding, boosting cashless economy, suppressing tax evasion and the most critical one being elimination of fake currency from circulation.

Media reports were predicting the pros and cons of the sudden event. Some of the predictions were that the unaccounted money would come into circulation and the share of the informal economy in India would shrink. The sustained crackdown on black money would compel Indians to hold their savings in physical assets such as gold and real estate, and instead increase the flow of savings into the market. It is further stated demonetisation is step towards becoming a cashless economy and to encourage its citizens to adopt the digital payments system for their transactions. The government had also initiated the unified payment interface (UPI) app for promoting cashless transaction using mobile phone. Besides alternate banking channels, online payment wallet companies like Paytm, PayUmoney, and MobiKwik got the momentary gain of demonetisation. Despite of several advantages of demonetisation, there are impeding challenges the economy is has to deal with.

The UN report identified gaps in India’s digital push, it states requirement of addressing determinants of country’s cash dependence beyond technology adoption, which includes low financial inclusion, high informality, persistent gender inequality in access to finance, low financial literacy, low ICT infrastructure and large gaps in energy access. Former Prime Minister, Dr. Manmohan Singh, referred demonetisation as ‘monumental mismanagement’ by the government. Singh called “the scheme of demonetization, the way it had been implemented would hurt agricultural growth of the country, small industry, and all those people who are in the informal sectors of the economy”.

The government’s inability to deal with cash availability had hit the common man sternly as several banks and ATMs across the country dispensed little or no cash. Rural and semi-urban population were the major sufferers as almost of their petty transactions are done through cash. Dana (2000) elaborates on the history of entrepreneurship in India and the efforts made by various government agencies to foster the growth of entrepreneurs. Further, by enforcing demonetisation, government of India has also bought a drive in trade and business, signaling into ‘less cash economy’ (CAIT, 2016). Thus the consequences of demonetisation were as follows:

- **Effect on money supply**
  
  Old 500 and 1,000 rupees notes being scrapped, and until the new 500 and 2,000 rupees notes get circulated and made widely available in the market. The money supply was reducing in the short run. Till the period the black money does not re-enter the system the money supply would remain short. However gradually as the new notes get circulated in the market and the mismatch gets corrected, money supply would pick up.

- **Effect on product and services demand**
  
  The overall demand was expected to be affected to a greater extent. The demand in following areas was impacted particularly:
  
  a. Consumer goods.
  
  b. Real estate and property.
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All these mentioned sectors faced major moderations in demand from the consumer side, owing to the significant amount of cash transactions involved in these sectors.

- **Effect on banks**
  As directed by the Government, the 500 and 1,000 rupee notes which now cease to be legal tender had to be deposited or exchanged in banks (subject to certain limits). This has automatically led to more amounts being deposited in savings and current account of commercial banks. This in turn enhanced the liquidity position of the banks, which now can be utilised further for lending purposes.

- **Effect on alternate banking and payment options**
  With cash transactions facing a reduction, alternative forms of payment have seen a surge in demand. Digital transaction systems, E-wallets and apps, online transactions using E-banking, usage of plastic money (debit and credit cards), and others would definitely see substantial increase in demand in the near future. This should eventually lead to strengthening of such systems and the infrastructure required to fully automate the economy.

- **Effect on various economic entities**
  With cash transaction lowering in the short run, until the new notes are spread widely into circulation, certain sections of the society could face short-term disruptions in facilitation of their transactions. These sections are:
  - Agriculture and related sector.
  - Small traders.
  - SME.
  - Services sector.
  - Households.
  - Freelancers.
  - Wage earners.
  - Professionals like doctor, carpenter, utility service providers, etc.
  - Retail outlets.

In the light of the discussion above, the present paper focuses on analysing the immediate impact on the demonetisation on the Indian economy and also whether its long term goal is to achieve cashless economy or not. The structure of the paper is as follows: Introduction is followed by the literature review which highlights the few of studies conducted in the area of demonetisation along with the evidence of this event from other countries. The next section focused on the objectives of the paper and the hypothesis framed. After that research methodology section focused on how the scale was built to measure the demonetisation impact and to analyse the move towards cashless economy. Analysis and discussion is then followed by the scope of future research and finally the conclusion of the study.
2 Literature review

Few studies suggested that maximising the long-term benefits and minimising the short-term costs associated to demonetisation. Minimising costs by replenishing the cash shortage, stable withdrawal limits, internal convertibility of cash from account and vice versa; thereby restoring the lost confidence of people towards financial system. Maximising the impetus provided to digitisation, taking forward the move gradually rather than swiftly, taking into consideration the digitally deprived, by respecting the choice rather than enforcing.

Sanyal (2016) has claimed that it was the constant inspiration and leadership by the government which had increased the probability of success of such government moves. Rani (2016) stated the plight of shopkeepers and consumers pacing up with demonetisation move by understanding and adopting online payment portals and alternate banking channels to survive.

Long-term and short-term study and Kulkarni and Tapas (2017) studied the rational and outcomes of demonetisation and currency contractions across countries. Study covered instances of sudden demonetisation from Ghana, Mynnmar, Brazil, Soviet Union, Russia, Iraq, North Korea, Cyprus, Greece and Venezuela. The Russian economy did the demonetisation for political reasons; Zimbabwe carried it out to get control over chaotic monetary system and Australia took that step for convenience of transactions and did it in a very efficient way. Similar to India, Ghana and Myanmar did it to fight against black money. The major reason of currency contraction had been to fight against hyperinflation or any economy crisis.

Raychaudhuri (2017) suggested that the goals of demonetisation lack logical consistency and it is unacceptable to expect growth in short run. Whereas Pandia (2017) believed that demonetisation is a deterrent to the terror funding and criminal activities and discourages the Indian tendency of hoarding money. Further demonetisation has been referred as good initiatives which would yield results in long run and tolerating transitory inconvenience is worth taking.

Balaji and Balaji (2017) studied the impact of demonetisation on cashless transactions. Study suggested that there was a positive impact on cashless transactions and building additional awareness about internet based banking channels and the risks involved with it.

Kulkarni and Tapas (2017) had evaluated the rationale of demonetisation and the study concluded that adapting cashless mode was still feasible to achieve in the long run but problem of corruption cannot be solved just by demonetisation. Since, it needs an attitudinal change in Indian citizen’s behaviour.

Moreover, the Indian studies (Gajjar, 2016; Ghosh, 2017; Mehta et al., 2016; Nerkar, 2016; Samuel and Saxena, 2017; Singhal, 2017) related to demonetisation were qualitative in nature where implications were induced based on secondary facts and experiences. There is dearth of studies which empirically measures the impact of demonetisation on economy and its subsequent effect on cashless economy. Thus our study fills this gap and presents the scale to measure the immediate impact of demonetisation.
3 Objectives

In the light of the discussion and literature above, the main objective of the paper is to analyse the overall scenario impact of the demonetisation. In other words, it is to know the public perspective towards demonetisation. The following sub-objectives are framed to analyse the main objective:

1. Analyse the immediate impact of demonetisation.
2. To explore the long-term and short-term perception of economy after demonetisation.
3. To explore the awareness level of public towards UPI, post demonetisation.
4. To understand the barriers, in moving towards cashless economy.
5. To investigate the impact of demonetisation on Indian economy.
6. To analyse the influence of demonetisation towards cashless economy.

4 Hypothesis

H0 Demonetisation has impacted the Indian economy.
H01 There is an immediate effect of demonetisation on the Indian economy.
H02 Demonetisation has helped in limiting the economic concerns.
H03 Demonetisation has moved the Indian economy towards cashless economy.
H04 Economic concerns do not mediate the effect of demonetisation on cashless economy.

5 Research methodology

The major objective of the study is to analyse the immediate effect of the demonetisation on the Indian economy. Since the area of research under study, i.e., demonetisation lacks any theoretical foundation across globe. Hence, it was initiated to construct a scale for demonetisation which can measure its effectiveness and impact on Indian economy. Hinkin et al. (1997) have established a systematic seven-step scale development process, which commences with the creation of items to measure a construct under analysis? This process can be conducted inductively, by generating items first, from which scales are then derived, or deductively, starting with a theoretical definition from which items are then generated. The inductive method was used to create the scale. Statements were kept as short as simple as possible in the language suitable to the target respondents, avoiding double-barrelled and negative words. Items were created focusing on the objective that it should be understood by the respondents to get meaningful responses and limited items per scale were included as they are the foundation for internal consistency reliability.
The scale thus created of 37 initial item pool, were pretested for the content adequacy of the items as it allows the deletion of items that may be conceptually inconsistent. The content adequacy was conducted through four knowledge experts from the area of banking, economics and psychology and piloted by factor analysis on a smaller data, i.e., 50 respondents. Four versions of scale in different order were administered, to control bias effects due to order effects.

In the next step, measurement instrument was administered focusing on the requisite measurement scale (nominal, interval or scale) and sample size. It is suggested that new items be scaled using five-point or seven-point Likert scales. Since, it enables to create variances, essential to examine the relationship among items and scales and create adequate coefficient alpha reliability estimates (Lissitz and Green, 1975). The minimum item-to-response ratio for exploratory factor analysis (EFA) is 1:5 (Hair et al., 1998) and for confirmatory factor analysis (CFA) and SEM its 1:10. Thus the scale used was five-point Likert scale and data was collected from the respondents. To test the hypotheses a self-administered online survey was developed. The questionnaire was developed on the basis of various news items published in the newspapers, few of the research papers highlighting the impact and the major implications which were observed during that period. Questionnaire is validated from the two industry experts and two academicians for face and content validity. E copies along with the hard copies of the questionnaires were distributed to the people who were either working in firms, public or private, or having their own business or profession. Thus in other words, responses were asked only from people who were earning an income from any source. Overall 500 questionnaires were sent and 413 were received back. Out of the 413 responses only 370 were found to be valid for the analysis.

Further, it is essential to evaluate items through factor analysis. The EFA reduces the set of items into constructs which are able to predict the likelihood of model. EFA is conducted by way of IBM SPSS 23 on the sample of 190 respondents. After that CFA is conducted on the sample of 370 respondents followed by the structural equation modelling and path analysis for the testing of major hypothesis and checking of consistency in the results.

6 Analysis and discussion

Figures 1 to 7 highlights the few implications of demonetisation on the Indian economy. These charts depict the immediate nonfunctional and functional impact of November 8, 2016 announcement on the Indian economy. Figures 1 and 2 highlights the amount deposited and withdrawn by the respondents during the demonetisation window. Around 75% of the respondents have deposited less than ₹50,000, followed by 10.3% of the respondents who have deposited in between ₹100,000 to ₹200,000. We have also seen that respondents were unwilling to disclose the amount deposited by them in the bank especially when it was beyond ₹250,000. If the scenario of cash deposited is too been seen from Figure 2, it can be concluded that maximum of the respondents have withdrawn less than ₹20,000. 33% of the respondents have said that they withdrew ₹20,000 to ₹50,000 after the demonetisation.
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Figure 1  Cash deposited till 31st December 16 (see online version for colours)

Source:  Author representation

Figure 2  Currency exchanged till 31st December 16 (see online version for colours)

Source:  Author representation

As earlier highlighted in the introduction that economic entities were affected by the demonetisation done by the Indian government. Figure 3 highlights the viewpoint of the respondents with respect to demonetisation impact on small Kirana owners, retail outlet owners, big entrepreneurs, salaried class, homemakers, freelancers and wage earners. Respondents were asked to rate the impact on all the economic entities on the scale of very favourable to very unfavourable. Around 58% of the respondents were of the view that demonetisation has very unfavourably impacted the wage earners followed by the small Kirana owners. Retail outlet owners were the next affected ones by the demonetisation in the unfavourable way. In terms of favourable and very favourable impact, the most preferred ones were big entrepreneurs and salaried class.
Majority of the respondents have visited the bank one to three times in order to withdraw the cash and there were only handful of the people who have not visited the bank even once, i.e., 10% as shown in Figure 4. More than 20% of the people had to visit the bank for more than three times to withdraw the cash due to demonetisation.

**Figure 3** Impact on economic entities (see online version for colours)

**Source:** Author representation

**Figure 4** Bank visits for withdrawal of cash (see online version for colours)

**Source:** Author representation
We have also asked the respondents that whether they have used the old currency instead of depositing in the bank and results of these are presented in Figure 5. 60% of the respondents have agreed to usage of the cash for other purposes and not depositing it in the bank in order to avoid crossing of the limits set by the government of deposits. Figure 6 maps the various avenues in which respondents have used their old currency notes. Around 228 respondents have agreed to use of the old currency in the petrol for filling of the petrol in their vehicles. Then the next two major avenues that emerged were medicines and the groceries. People have also paid their utility bills from the old currency instead of depositing it in the bank.

**Figure 5** Consumption of old currency (see online version for colours)

Source: Author representation

**Figure 6** Usage of old currency (see online version for colours)

Source: Author representation
Since one of our objective is to analyse the impact of demonetisation towards moving to cashless economy. Thus we asked the opinions from the public about what they think are the current barriers or obstacles in moving towards fully cashless economy in Figure 7. The word cloud is generated on the basis of the frequency distribution made of the responses received. Majority of them said lack of infrastructure and internet access followed by the security concern in doing online payments. Thus technology reach, speed and infrastructure are the prominent barriers in moving towards fully cashless economy.

Figure 7  Word cloud of barriers towards cashless economy (see online version for colours)

This descriptive analysis discussed highlights the immediate effect of demonetisation on the economy as a whole. This is just the short-term view of the effect and in order to analyse the impact as a whole, factor analysis has been used.

As the content and face validity has already been done in the pilot survey along with the industry experts and academicians. Hence with regard to construct validity, EFA and CFA are used. Since no research background is available to measure the impact of demonetisation, 37 statements has been framed after many deliberations with the peers and EFA is applied to categorise them into various factors. To analyse the applicability of EFA, four parameters are checked for the data, namely Kaiser-Meyer-Oklin (KMO) and Bartlett test, eigenvalue to be one, factor loadings of all the factors to be more than 0.40, and the varimax rotation to analyse the factors. Table 1 shows that factor analysis is suitable for analysing the data, as KMO is greater than 0.50 indicating that sample is adequate and Bartlett’s test of sphericity $\chi^2(p \leq 0.000)$. On the basis of the eigenvalue equal to one, a six factor model was formed that explained 68.21% of the total variance.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>KMO and Bartlett’s test</th>
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<tr>
<td>Kaiser-Meyer-Oklin measure of sampling adequacy</td>
<td>.841</td>
</tr>
<tr>
<td>Bartlett’s test of sphericity</td>
<td>Approx. Chi-square 9368.431</td>
</tr>
<tr>
<td>Df</td>
<td>820</td>
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<tr>
<td>Sig.</td>
<td>0.000</td>
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Source: Author representation
Table 2  Results of EFA and CFA

<table>
<thead>
<tr>
<th>Factors</th>
<th>Variables</th>
<th>Statements</th>
<th>EFA</th>
<th>CFA</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC</td>
<td>BM</td>
<td>Black money</td>
<td>.801</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>TR</td>
<td>Terrorism</td>
<td>.797</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>CP</td>
<td>Corruption</td>
<td>.746</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>Inequality of income</td>
<td>.674</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>UE</td>
<td>Unemployment</td>
<td>.649</td>
<td>0.68</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eigenvalue = 6.021, CR = 0.867, AVE = 0.583</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE</td>
<td>CE3</td>
<td>Cash less transactions make a better economy</td>
<td>.674</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>CE2</td>
<td>Shifting to fully cash less economy is good</td>
<td>.646</td>
<td>0.68</td>
</tr>
<tr>
<td></td>
<td>CE1</td>
<td>Post demonetisation, everyone has adopted cash less transactions</td>
<td>.627</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>IB</td>
<td>Internet banking</td>
<td>.841</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td>Plastic money</td>
<td>.802</td>
<td>0.82</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eigenvalue = 4.014, CR = 0.821, AVE = 0.512</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITeS</td>
<td>PM1</td>
<td>Unused debit cards are into use now</td>
<td>.786</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>PM3</td>
<td>Government is promoting use of debit and credit cards on petrol pumps and other payments</td>
<td>.692</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>PM2</td>
<td>More people have opted for credit cards</td>
<td>.658</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>PP1</td>
<td>The concept of payment portals is necessary to understand for all, post demonetisation</td>
<td>.512</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>PP2</td>
<td>Demonetisation made me use payment portals</td>
<td>.469</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>PP3</td>
<td>Payments of all the utility bills using payment portals has increased</td>
<td>.455</td>
<td>0.61</td>
</tr>
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<td></td>
<td>MB2</td>
<td>Internet banking is more secure to use than mobile banking</td>
<td>.659</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>EB1</td>
<td>The use of E-banking services are made compulsory to you</td>
<td>.640</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>EB2</td>
<td>It is easy to shift all business transactions via E-banking. Does everyone have resources to shift to e banking?</td>
<td>.584</td>
<td>0.60</td>
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<tr>
<td></td>
<td>EB4</td>
<td>E-banking facility providers are attracting new customers.</td>
<td>.465</td>
<td>0.60</td>
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<tr>
<td></td>
<td>MB1</td>
<td>Mobile banking is more convenient to use as compared to internet banking</td>
<td>.415</td>
<td>0.61</td>
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<td></td>
<td></td>
<td>Eigenvalue = 3.781, CR = 0.838, AVE = 0.68</td>
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Source: Author calculation
Table 2  Results of EFA and CFA (continued)

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<th>EFA</th>
<th>CFA</th>
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<tr>
<td></td>
<td>TB</td>
<td>I prefer branch banking as compared to Internet banking</td>
<td>.904</td>
<td>.91</td>
</tr>
<tr>
<td></td>
<td>BB3IB3</td>
<td>I prefer branch banking as compared to mobile banking</td>
<td>.874</td>
<td>.90</td>
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<tr>
<td></td>
<td>BB2MB3</td>
<td>Branch banking is preferable because of the services provided by the staff</td>
<td>.787</td>
<td>.81</td>
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<td></td>
<td>BB1</td>
<td>I am still comfortable in visiting the bank after demonetisation?</td>
<td>.689</td>
<td>.71</td>
</tr>
<tr>
<td></td>
<td>BB4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PP</td>
<td>I feel more secure while using UPI over payment portal</td>
<td>.713</td>
<td>.73</td>
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<td></td>
<td>UPI3PP8</td>
<td>You prefer UPI over payment portal</td>
<td>.707</td>
<td>.71</td>
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<td></td>
<td>UPI1PP6</td>
<td>Cash back is the strong reason to use payment portals</td>
<td>.655</td>
<td>.67</td>
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<td></td>
<td>UPI5PP5</td>
<td>Use of payment portals was common even before the demonetisation</td>
<td>.461</td>
<td>.63</td>
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<td></td>
<td>UPI4PP4</td>
<td>Payment portals give me more incentives to use than UPI</td>
<td>.409</td>
<td>.60</td>
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<tr>
<td></td>
<td>UPI2PP7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SI</td>
<td>Imbalance between rich and poor has been equalised after demonetisation</td>
<td>.860</td>
<td>.88</td>
</tr>
<tr>
<td></td>
<td>SI7</td>
<td>Demonetisation is for nation’s good than a mere political stint</td>
<td>.828</td>
<td>.84</td>
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<td></td>
<td>SI5</td>
<td>Problem of corruption cannot be solved just by demonetisation</td>
<td>.776</td>
<td>.79</td>
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<td></td>
<td>SI4</td>
<td>I feel that most of the unaccounted money has been deposited into banks post demonetisation</td>
<td>.566</td>
<td>.61</td>
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<td></td>
<td>SI8</td>
<td>I feel wage earners were misused at the time of exchanging currency from banks</td>
<td>.584</td>
<td>.60</td>
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<td></td>
<td>SI1</td>
<td>There is a connection between black money and terrorism</td>
<td>.572</td>
<td>.62</td>
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<td></td>
<td>SI2</td>
<td>Sentiments of daily wage earners are hurt because of increased unemployment in unorganised sectors</td>
<td>.408</td>
<td>.60</td>
</tr>
<tr>
<td></td>
<td>SI6</td>
<td></td>
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Source: Author calculation
Figure 8  SEM model (see online version for colours)

Source: Author representation
The result of the EFA along with the factor loadings is presented in Table 2. The six factors which were finalised by the EFA are economic concerns, cashless economy, payment portals, IT enabled services, traditional banking and social issues. After formation of factors, that were the result of demonetisation, by EFA, CFA was conducted to validate them. Results given by CFA are presented in Table 3. In order to maintain the face validity, the items with high loadings are retained. All the statements received the standardised factor loadings larger than the recommended value of 0.4. Thus suggesting that the instrument is valid and none of the selected statements needs to be excluded. The results of CFA suggested that the statements related to payment portals and alternate banking options were combining into one. Thus model was run again with both the factors merged and the results improved. The values of CR and average variance extracted (AVE) for each construct are all above the desired levels. It can be seen that all the factor loadings in CFA are greater than 0.70 and have significant t-values also. All AVEs exceed 0.5, all CRs (the degree to which items are free from random error and therefore render consistent results) exceed 0.7 showing minimally accepted construct reliability (Gefen et al., 2000).

To assess the CFA, goodness of measurement model fit using SEM were used: \( \chi^2 (p \geq 0.05) \); goodness-of-fit index (GFI \( \geq 0.90 \)); adjusted goodness-of-fit index (AGFI \( \geq 0.80 \)); normed fit index (NFI \( \geq 0.90 \)); non-normed fit index (NNFI \( \geq 0.90 \)); comparative fit index (CFI \( \geq 0.90 \)); standardised root mean-square residual (SRMR \( \leq 0.08 \)); and root mean-square error of approximation (RMSEA \( < 0.10 \)). The result of the SEM demonetisation model is presented in Table 3, indicating that all the model statistics are better than the recommended values.

**Table 3** Model goodness of fit indices

<table>
<thead>
<tr>
<th>Desired level</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \chi^2, p \geq 0.05 )</td>
<td>0.00</td>
</tr>
<tr>
<td>NFI ( \geq 0.90 )</td>
<td>0.90</td>
</tr>
<tr>
<td>NNFI ( \geq 0.90 )</td>
<td>0.92</td>
</tr>
<tr>
<td>CFI ( \geq 0.90 )</td>
<td>0.92</td>
</tr>
<tr>
<td>GFI ( \geq 0.90 )</td>
<td>0.91</td>
</tr>
<tr>
<td>AGFI ( \geq 0.80 )</td>
<td>0.85</td>
</tr>
<tr>
<td>SRMR ( \leq 0.08 )</td>
<td>0.05</td>
</tr>
<tr>
<td>RMSEA ( &lt; 0.10 )</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Source: Author calculation

SEM model concluded that major impact of demonetisation is seen on the IT enabled services followed by the payment portals and the social issues. All these indicates one trend, i.e., surge in the use of plastic money in the form of credit and debit cards, activation of deactivated internet banking accounts, increase use of payment portals and other bank apps for doing payments and other transactions. After demonetisation traditional banking has taken a setback, as now people prefer to do online transactions and also there is long waiting time in the banks. That is the reason that SEM model have shown the negative impact of demonetisation. IT enabled service providers are luring the customers by offers and perks to transact online as much as possible, hence now very few
Measuring demonetisation: a path towards the cashless India

visit the bank for daily transactions. It has also been observed and even felt by the respondents that circulation of black money has reduced after the happening of the event, as not much cash is available in the hand of the general public. In terms of impact on economic concerns, measured by terrorism, black money, inequality of income, unemployment and corruption, respondents believed that there is reduction in these activities after the demonetisation. This can be interpreted as there is reduction in black money as compared to earlier status the announcement; better disclosure of income; more transparent business dealings; less holding of huge amounts of cash in hand and others.

To test the last hypothesis and to assess the presence of mediating variables using structural equation modelling, the procedure outlined by Baron and Kenny (1986), Judd and Kenny (1981) and James and Brett (1984) is followed.

It demonstrates that four necessary conditions should be met to fulfil the mediation requirements. First, the causal variable (demonetisation effect) must be significantly associated with the outcome (cashless economy) in the absence of the mediating variable (economic concerns, Step 1). This step establishes that there is an effect that may be mediated, also referred as total effect. The second condition is that the causal variable (demonetisation effect) must be significantly associated with the mediating variable (economic concerns, Step 2). This step basically treats the mediator as if it was an outcome variable. The third condition is that the mediating variable (economic concerns) must be significantly associated with the outcome (cashless economy, Step 3). The beta value derived from step two and three represents indirect effect. Lastly, the final condition is that when the mediating (economic concerns) variables are included, the direct relationship between the causal variable (demonetisation effect) and the outcome (cashless economy) becomes significantly less (partial mediation) or negligible (full mediation, Step 4).

Table 4 Mediation effect

<table>
<thead>
<tr>
<th>Effect (derived from step)</th>
<th>Beta</th>
<th>p-value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total effect, Step 1</td>
<td>.89</td>
<td>.001</td>
<td>Total effect is significant</td>
</tr>
<tr>
<td>Indirect effect, Step 2 and 3</td>
<td>.61 * .65 = .396</td>
<td>.001</td>
<td>Significant, mediation exists</td>
</tr>
<tr>
<td>Direct effect, Step 4</td>
<td>.114</td>
<td>.043</td>
<td>Insignificant, full mediation exists</td>
</tr>
</tbody>
</table>

Hence the study failed to reject three out of four hypotheses and concludes that demonetisation had an immediate and long-term impact on the Indian economy. The results of the hypothesis are as follows:

H01 There is an immediate effect of demonetisation on the Indian economy.

Failed to reject the null hypothesis, i.e., there is an immediate impact of the Demonetisation on the Indian economy as the traditional banking has reduced, payments portals have gained, alternate banking options are being used more widely by the public, there is less liquid cash in the households and the business houses, sales in various sectors and of various products has been affected.

H02 Demonetisation has helped in limiting the economic concerns.

Failed to reject the null hypothesis, i.e., economic concerns of the country have taken a hit on the positive side, as there is less activity in them after demonetisation and the impact is also high as seen in the SEM model.
H03 Demonetisation has moved the Indian economy towards cashless economy.
Failed to reject the null hypothesis, i.e., this demonetisation is a move towards cashless India and is the long-term goal of the government. People have adopted the IT enables services and the payment portals after the demonetisation and are thus more willing to transact online as compared to traditional banking.

H04 Economic concerns does not mediate the effect of demonetisation on cashless economy.
Null hypothesis is rejected in favour of the alternate hypothesis, i.e. Economic concerns mediate the effect of demonetisation on the cashless economy. In other words, due to demonetisation it has been observed that various social issues have got affected which in turn will help in marching towards cashless economy. Economic concerns variable appears to fully mediate the relationship, which implies a significant finding in the demonetisation literature. Hence, it can be said that if demonetisation will be successful in eroding the economic constraints of black money, terrorism, inequality of income and tax evasion attitude, moving towards cashless economy would be more effective.

7 Scope of future research
Since demonetisation is the recent happening thus it will take time to reveal the actual impact on the Indian economy. The discussion done in the paper is based on the short-term or the immediate impact of this currency change. The researchers can develop more on this by way of analysing the mediating effect of the economic concerns on the move towards cashless economy. Impact of demonetisation can be analysed in the long-term as well as in the short-term, in order to frame the future policies and better understand the government perspective of taking this action. Impact on various sectors separately can be analysed in the light of change in their financial dealings, impact on their finances, conducting of the business and others. On the financial side, demonetisation impact on the share prices and the foreign investment can be greater future interest as both are majorly dependent on economic happenings like these.

8 Conclusions
The present study is to analyse the immediate impact of demonetisation on the Indian economy. Structured equation modelling was done on the responses of 370 respondents focusing on almost all the perspectives of the economy. Results suggested that demonetisation impact can be measured by way of initial six variables, i.e., economic concerns, cashless economy, IT enabled services, social issues, payment portals and traditional banking. With the help of CFA and SEM, the final demonetisation was derived to study the impact. The results suggested that traditional banking was negatively impacted by the demonetisation. Thus showing that now people are least interested to visit the banks or reluctant to visit. With this change the payment portals and alternate banking channels have seen a surge in their business and markets. Now more people are moving towards the cashless economy as direct effect of demonetisation is seen more on it than on economic concerns. Thus it can be concluded that demonetisation has definitely
laid the path for cashless economy but still there is long way to go. Various infrastructural changes are required; internet should be made available to each and every one and at each and every place. More incentives or offers are to be given for the E-transactions in order to motivate the people to do more cashless transactions. With stringing of other policies and laws along with demonetisation long-term effect, it can also be hoped that economic concerns are limited to some extent. Economic concerns variable appears to fully mediate the relationship, which implies a significant finding in the demonetisation literature. Hence, it can be said that if demonetisation will be successful in eroding the economic constraints of black money, terrorism, inequality of income and tax evasion attitude, moving towards cashless economy would be more effective. Overall study concludes that there is an immediate effect of demonetisation on the Indian economy; demonetisation has helped in limiting the economic concerns; demonetisation has moved the Indian economy towards cashless economy; and economic concerns mediate the effect of demonetisation on cashless economy.

References


