INDEX OF CASHLESS TRANSACTION

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What is Cashless Transaction?

• Exchange of goods and services and transfer of money from one to other, without the use of currencies but using the financial transaction system provided by the financial institutions.
WHY CASHLESS TRANSACTION?

• Lower transaction cost (from consumer side)

• Reduce cost of production of coins and currencies

• Reduce potential of black money

• Transparency in business accounts will help in collection of taxes.
GOVT. INITIATIVES (POST DEMONETIZATION)

• Unstructured Supplementary Service Data (USSD)

• Aadhar Enabled Payment system (AEPS)

• Digital Finance for Rural India: Creating Awareness and access through CSCs’

• 0.75% Discount on purchase of petrol/ diesel if payment is made through digital means.

• Development of 2 POS devices each in 1 lakh villages with population less than 10,000, through NABARD.
GOVT. INITIATIVES (POST DEMONETIZATION)

• Issuing of ‘Rupay Kisan Cards’ to 4.32 crore Kisan Credit Card holder to make digital transaction.

• MDR charges shall be borne by the Govt. for the transaction under 2000.

• Discount of 10% at Toll Plazas on NH for the payments using cards.
Why Need an Index?

• Demand Deposit with banks as a proportion of money supply is not a better way

• To define the extent of cashless transaction differently.
LITERATURE

• **Humphrey, Pulley and Vesala (1996)** did a comparative study between cash paper payment and electronic payments, they analyzed the pattern of payment instruments use over time for fifteen countries.

• **Westland, Kwok, Shu, Kwok, Henry Ho (1998)** have done an analysis on the acceptance of electronic cash (Mondex e cash) among the customers and merchants of the Hong Kong.

• **Humphrey, Kim and Vale (2001)**, have done a study of usage of electronic payments over cash between U.S, Europe, Norway and Japan on the basis of Cash to GDP ratio and number of noncash transactions per persons.
Method

• Exogenous effects

• Volume and value of the cashless transaction can increase due to the increase in the adult population.
  • we have considered Per Capita volume of the cashless transaction as well as per capita value of the cashless transaction.

• The value of the cashless transaction can be increased because of the increase in the overall price level or production.
  • We have considered Value of the cashless transaction as a proportion GDP
METHOD

• The Indexes, which we have considered for our analysis, are:

  • Per Capita Volume Index of The Cashless Transaction.
  
  • Per Capita Value Index of The Cashless Transaction.
  
  • Value of The Cashless transaction as a proportion of GDP Index.
INDIVIDUAL DIMENSION INDEX

• We have used Mandira Sharma’s multidimensional index (2010)
• $i^{th}$ dimension index is computed using the following formula.

$$d_i = \left( \frac{x_i - m_i}{M_i - m_i} \right)$$

- Unit free
- Bounded
- Homogeneous
- Monotonic

• $x_i =$ actual value of the dimension
• $M_i =$ maximum value of the dimension (sample maximum)
• $m_i =$ minimum value of the dimension (sample minimum)
AGGREGATE INDEX

• By averaging all the normalized dimensions with weights we get our desired index.

\[ I_r[d_1, d_2, ..., d_k] = \sum_{i=1}^{k} w_i \left( \frac{x_i - m_i}{M_i - m_i} \right) \]

• Where \( k = \text{no. of dimensions} \),
  \( w_i = \text{Weights (using Principal Component Analysis)} \)

• And rest of the symbols have their previous meaning

• For structural breaks we have used Cusum Test
THE DIMENSIONS OF PER CAPITA VOLUME INDEX:

- The **No. of cards** per adult population
- The number of **POS** transaction (with debit and credit cards) per adult population.
- The number of **NEFT** transaction per adult population.
- The number of **RTGS** transaction per adult population.
- The number of **IMPS** transaction per adult population.
- The number of **ECS Debit & Credit +NACH** transaction per adult population.
DIMENSIONS OF PER CAPITA VALUE INDEX

• Amount of **POS** transaction per adult population.

• Amount of **NEFT** transaction per adult population.

• Amount of **RTGS** transaction per adult population.

• Amount of **IMPS** transaction per adult population.

• Amount of **ECS debit & credit + NACH** transaction per adult population.
DIMENSIONS OF VALUE AS A PROPORTION OF GDP INDEX

- Amount of POS transaction as a proportion of GDP.
- Amount of NEFT transaction as a proportion of GDP.
- Amount of RTGS transaction as a proportion of GDP.
- Amount of IMPS transaction as a proportion of GDP.
- Amount of ECS debit & credit + NACH transaction as a proportion of GDP.
# DATA SOURCE AND TYPE

- We have done the analysis on Indian economy overtime.
- Month wise analysis
- Total 76 time points from Sep 2012 to Dec 2018

<table>
<thead>
<tr>
<th>Data Title</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bank-wise value and volume of the electronic transaction over the months</td>
<td>RBI</td>
</tr>
<tr>
<td>2. Bank- Wise value and volume of NEFT, RTGS, Mobile Banking transaction</td>
<td>RBI</td>
</tr>
<tr>
<td>3. Quarterly GDP data and growth rate (Expenditure approach, seasonally</td>
<td>OECD</td>
</tr>
<tr>
<td>adjusted, at constant prices (2011-12))</td>
<td></td>
</tr>
<tr>
<td>4. Adult Population Data (from the age group of 15 and above)</td>
<td>World Bank</td>
</tr>
</tbody>
</table>
MONTHLY GDP CALCULATION

• Monthly growth rate \((r)\) = quarterly growth rate/3

• We assume the GDP has grown at this constant growth rate \(r\) so

\[
Y_2 = Y_1(1+r) \\
Y_3 = Y_1(1+r)^2
\]

• Where \(y_1\) = monthly GDP of 1\(^{st}\) financial month
  \(y_2\) = monthly GDP of 2\(^{nd}\) financial month
  \(y_3\) = monthly GDP of 3\(^{rd}\) financial month

Such that 1\(^{st}\) quarter GDP \(Q_1 = y_1 + y_2 + y_3\).

\[
Y_1 + Y_1(1+r) + Y_1(1+r)^2 = Q_1 \\
Y_1 = \frac{Q_1}{1+(1+r)+(1+r)^2}
\]

Similarly we have the values of other months’ GDP
Per Capita Volume Index

Dependent Variable: _N_PER_CAPITA_VOLUME_IND
Method: Least Squares
Date: 11/14/19  Time: 17:51
Sample: 174
Included observations: 74

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
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</thead>
<tbody>
<tr>
<td>TIMES</td>
<td>0.013777</td>
<td>0.000272</td>
<td>50.56951</td>
<td>0.0000</td>
</tr>
<tr>
<td>C</td>
<td>-0.104671</td>
<td>0.011758</td>
<td>-8.902426</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared | 0.972616 | Mean dependent var | 0.411971 |
Adjusted R-squared | 0.97236 | S.D. dependent var | 0.300431 |
S.E. of regression | 0.050060 | Akaike info criterion | -3.124549 |
Sum squared resid | 0.180429 | Schwarz criterion | -3.062277 |
Log likelihood | 117.6083 | Hannan-Quinn criter. | -3.099708 |
F-statistic | 2557.275 | Durbin-Watson stat | 0.129931 |
Prob(F-statistic) | 0.000000 |
Dependent Variable: _N_PER_CAPITA_VALUE_INDE
Method: Least Squares
Date: 11/08/19   Time: 15:10
Sample: 174
Included observations: 74

_N_PER_CAPITA_VALUE_INDE = C(1)*TIMES + C(2)*TIMES^2 + C(3)

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C(1)</td>
<td>-0.002912</td>
<td>0.000637</td>
<td>-4.571322</td>
<td>0.0000</td>
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<tr>
<td>C(2)</td>
<td>0.000209</td>
<td>8.23E-06</td>
<td>25.42146</td>
<td>0.0000</td>
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<tr>
<td>C(3)</td>
<td>0.062574</td>
<td>0.010352</td>
<td>6.044544</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared     0.990310  Mean dependent var 0.343077
Adjusted R-squared 0.990037  S.D. dependent var 0.289388
S.E. of regression 0.028885  Akaike info criterion -4.211262
Sum squared resid 0.059240  Schwarz criterion -4.117854
Log likelihood 158.8167  Hannan-Quinn criter. -4.174000
F-statistic 3628.007  Durbin-Watson stat 0.621307
Prob(F-statistic) 0.000000
FINDINGS (Individual dimension wise)

- Amount of POS/Adult Population
- Amount of NEFT/Adult Population
- Amount of RTGS/Adult Population
- Amount of IMPS/Adult Population
- Amount of ECS+NACH/Adult Population
FINDINGS (Individual dimension wise)

Amount of POS/ GDP

Amount of NEFT/ GDP

Amount of RTGS/ GDP

Amount of IMPS/ GDP

Amount of ECS+NACH/ GDP
FINDINGS (Individual dimension wise)

No. of Cards/ Adults Population
No. of POS/ Adult Population
No. of NEFT/ Adult Population
No. of RTGS/Adult Population
No. of IMPS/ Adult Population
No. of ECS+NACH/Adult Population
FINDINGS (Individual dimension wise)

Amount of POS / GDP

Amount of NEFT / GDP

Amount of RTGS / GDP

Amount of IMPS / GDP

Amount of ECS+NACH / GDP
CONCLUSION

• Per capita volume of the cashless transaction increases significantly from January 2015,

• but the per capita value of the cashless transaction and value as a proportion of GDP has increased after demonetization period but the effects are not enough satisfactory.

• So post demonetization policies have a positive impact on the value of the cashless transaction rather volume.
CONCLUSION

• Only POS transaction and IMPS transaction significantly increases after the demonetization period.

• The effect are very slightly and the increments are not that as expected.
THANK YOU....