

## THE ECONOMICS OF INFORMATION BEHIND INTRODUCTION OF POLYMER CURRENCY IN INDIA: AN EMPIRICAL ANALYSIS

**Dr. R. KanakaSudha,**  
Faculty Member-Academic Wing,  
The ICFAI Society, Hyderabad.

### ABSTRACT

*Money supply by the central bank of our country is based on various factors. Withing this, supply of currency (coins + banknotes) which falls under  $M_1$  component of money supply in India, plays an essential role. Of the two, that is, coins and banknotes, the printing and supply of banknotes is of high validity and importance because it has a direct relation to the money supply and the monetary policy of the economy. When we talk of banknotes in circulation, it has been and still is a constant endeavor by the Reserve Bank of India (RBI) to be quicker and smarter to stay ahead of counterfeiters, as forged currencies in circulation in most of the denominations is highly threatening in India. To overcome this, many countries around the world have adopted printing of polymer currency (fully polymer or hybrid variety or both), the credit of innovation belonging to Australia. There are countries which have fully switched over to polymer, some have paper banknotes along with polymer banknotes in circulation. India is contemplating on circulating polymer currency on a trial basis on ₹ 10 in selected 5 cities. Based on its efficacy, it will switch over to polymer currency in denominations of ₹20 and ₹50 later, as per its reports. This efficacy relies on the following factors, viz., to check the menace of forged currency in circulation, to increase the longevity of the currency in circulation, to effectively recycle the withdrawn unfit currencies into environmental friendly ways and last but not the least, to reap the advantages of faster production. However, while the RBI might work on the relative cost-benefit analysis, what suppose if polymer currency is not embraced by the people is a question that need to be inquired. It is because some countries that switched to polymer currency in some of their denominations re-switched to paper banknotes; to quote an example is the neighbouring country of India – Bangladesh.*

*India is a country of heterogeneous people. Issuance and withdrawal of banknotes in a country like India is no easy task given its population and its diversified nature. This research study is to inquire the general attitude and knowledge of certain important characteristic features attached to the use of currency in circulation and, if polymer currency is introduced in India, the degree of willingness to accept a change in the structure of the banknote. If there is a positive attitude towards polymer currency, then it could be a big savior to the printing authorities to reduce the cost of printing and withdrawal cost in the long run. It will also help the framers of monetary policy in forecasting the physical supply of money – the banknotes.*

**Keywords:** polymer currency, learning gap, spill-over effect, counterfeit currency

### **THE ECONOMICS OF INFORMATION BEHIND INTRODUCTION OF POLYMER CURRENCY IN INDIA: AN EMPIRICAL ANALYSIS**

“Money is a special kind of economic good”, stated the great Greek Philosopher, Aristotle (384-322 B.C.). From the primitive age, humans evolved with some sort of money-like objects. The type of ‘sort-of-money’ in every age depended on the nature of their livelihood<sup>i</sup>. The first real coins (bits of stamped metal having a fixed value) appeared in about 750 B.C. with the follow up of other metals like gold and silver. But exchanging metal for goods took a long time, because the precious metals had to be weighted and tested. “Traders were known to use false weights and to dilute the gold and silver with less valuable metals such as copper or tin”<sup>ii</sup>. In 700 B.C., the Lydians, came out with carefully weighted and tested bits of electrum. This idea spread<sup>iii</sup> everywhere; and in course of time, the issuing authorities embossed different stamps or marks on them. Finally, with the Chinese, the world economies transcended to paper currency system. Thus the evolution of money passed through many stages from commodity money to metallic money to paper money, credit money, near money, plastic money (debit and credit cards) and currently it stands at polymer currency. In India, the use of “money” dates back to the age of Arthashastra; she, being a high centre of attraction for trading and the wealth it

possessed during early times, history talks of the variety of coins and later, the use of paper currency, keeping in pace with rest of the world. The coins / paper money have changed in shape, size and denominations, security features and in the metal content / substrate used to mint coins / print currency notes in India. The latter has attracted immense attention by the sole printing authority of legal tender notes in India, i.e., the Reserve Bank of India (the RBI), mainly to (i) be ahead of counterfeiters and curtail the circulation of forged currencies within the country (ii) to increase the longevity of the currency in circulation, which is very low in India<sup>iv</sup>, and, (iii) the recycling of shredded and briquetted banknotes and its use thereafter. Reserve Bank of India (RBI) has stated that it is people in their transactions accepting a certain good as a medium of exchange that allows money to exist. “If that acceptance is withdrawn then money ceases to be, whatever exhortation the government may use”. Forged banknotes in circulation is not specific to India; it is a menace to any country that has counterfeit notes in circulation. The solution to this was provided by Australia in 1988 by introducing polymer currency and now more than 22 countries have followed suit, which India is also contemplating upon<sup>v</sup>. Not that counterfeiting is totally eradicated through polymer banknotes, but the rate has drastically come down in countries, which has adopted it. However, it has not come without a price; countries reason out that the expense incurred on printing polymer banknotes is much higher than that of paper banknotes; nevertheless, it is also the acceptance by the people<sup>vi</sup> since the handling of banknotes depend greatly on the attitude of the people, the rate of development of a country to recognize the importance and the due respect that need to be given to the legal banknotes that are in circulation and the climatic /weather conditions to be congenial enough for polymer banknotes to be used, to quote a few.

India is a country of heterogeneous people who also belong to different income-earning strata. In view of this varied structure, this research work tries to bring out the knowledge of the common man to distinguish between legal banknotes from illegal ones, whether they have been a prey to illegal currency and have incurred a revenue loss<sup>vii</sup> due to accidental holding of counterfeit banknote, their knowledge on recycling of withdrawn banknotes and the use of such products by them in day to day life and whether they are willing to accept the new type of currency to be in circulation which can keep at bay the revenue loss that they incur due to forged currency in circulation. The study area is Chennai city. The reason to choose this city is because

this city witnessed rapid and fast development within a short period of time. Hosting a natural port due to its coastal location, it tops the list of cities for the easy entrance and circulation of fake currency circulation. It is a city of booming high-income people on one side and standing just on the third position to have the highest slum-dwellers in India.

The supportive economic theories that form the background of this study is the economics of information - we know information is costly to produce but cheap to reproduce – so is the information on polymer currency, be it to the government or to the common man; economies of scope - to know the pulse of the people in accepting polymer currency in India; the spill over effect of knowledge – RBI has been making announcements on identifying legal banknotes from forged ones and on the introduction of polymer currency with a sample test on five cities initially in ₹10 denomination; and efficiency - use of economic resources that produces the maximum level of satisfaction possible with given inputs and technology. It is an ex ante work though, but could help policy framers as printing of banknotes and its circulation does have a strong thresh-hold in the functioning of monetary policy.

**REVIEW OF LITERATURE:** Counterfeit currency dates back as far as 600 B.C., notes Eric, (1996), and the method of counterfeiting had not greatly changed through the centuries. Reed Jr., (1998), contends that with the constant turnover of worn and torn bills, depending on the country, paper notes have a life span of 6 months to 2 years. There is also continuous pressure on governments to improve paper quality and the complexity of engraving and printing because of increasingly sophisticated counterfeiting, aided by modern colour copying machines. Paper currency is not a minor budget since importing paper or the currency itself would eat upon the huge import bill. Balachandran (2000) specifies that designing currency notes by the Reserve Bank of India is a continuous process which forms a major part of the Bank's currency responsibilities because safeguarding it from forgeries and the exchange for gain of notes mutilated in particular ways were among the important considerations influencing the design of currency notes. Running along these lines are the objectives of Sankaranarayanan (2006), who deem it necessary by the RBI to stay ahead of the counterfeiter and to maintain confidence of the public while issuing banknotes in India. Radhakrishnan (2008) highlights the importance of detecting forged currency in circulation in India at the commercial banks' handling stage itself.

India Today (2009) gives a detailed account of the fake currency circulation in India, how they are injected into our country by neighbouring countries via various important ports. Ian Lancaster (2010) opines that India's emergence as an Asian powerhouse could prompt the authorities to upgrade the security of the rupee in a bid to thwart criminals who will undoubtedly be tempted to fill the gap in banknote capacity with counterfeit ones where the focus could switch from meeting banknote demand to greater security, the latter lying in the holograms of banknotes. These clearly indicate the necessity of constantly enhancing security features in the banknotes of India by the issuing authority to keep counterfeit notes at bay from entering into circulation. Looking into the costs of printing banknotes in India, Anupam Dasgupta (2010), attributes the main reason for a sufficiently large proportion of counterfeit banknotes to be in circulation to the shocking fact that only 5 percent of India's currency paper is made in India and the rest is imported from any of the 11 firms in Europe. It is understood that two aspects need immediate attention. First, is the cause of counterfeit currency threat and the second, is the increasing cost of import of currency. Running on different lines, Mohul Ghosh (2014) asserts that the cost incurred towards Indian currency to be very high. He quotes that as per Government estimates, destruction of unfit currencies translate into losses worth ₹ 2 lakh crore, every 12 months. During 2011-12, 13 billion units of Indian currency were deemed unfit to use, thereby inciting direct losses to the Government. Again, on the destruction and recycling front, Frank Wettstein et al (2000) talk of the green house effect caused by the destruction of withdrawn Swiss banknotes while Raymond Kent (1961) in his theory, signifies the importance of bank notes as they form the most important kind of hand-to-hand money in circulation, their issue and retirement must be carefully regulated if they are to serve rather than to harm economic society. International Polymer Currency Association (IPCA) (2009), states that polymer notes are 100 percent recyclable and can be converted into other plastic products. The fact that partially printed production spoilage, waste, or withdrawn unfit banknotes have a variety of inks printed on the polymer, does not prevent the material from being recycled. The entire product (substrate and inks) is blended into a uniform material during the recycling process. From the Indian point of view, RBI is concerned over the recycling of shredded and briquetted banknotes withdrawn from circulation in India; they are mostly used as landfills. On the comparative side between the two substrates, namely, paper and polymer, Rankin and Kerrison's (2005) study

give the advantages of polymer banknotes, the main being a reduction in the circulation of counterfeit currency. Morris Mulomba, (2007) however has a different dimension to the introduction of polymer banknotes in the country of Zambia, the first African country to use polymer notes. The author is concerned of the withdrawal of unfit polymer banknotes from rural areas and the non-feasibility of recycling methods in his country; it can be noted here that similar challenges might be faced in India as well.

**OBJECTIVES OF THE STUDY:** The main aim and focus of this research study is

- (i) To assess the respondents' ability and knowledge of the identifying forged currency from legal ones in the study area
- (ii) To estimate the level of revenue loss of the respondents being a victim by holding of counterfeit banknotes accidentally
- (iii) To analyze the level of understanding and usage of recycled banknotes withdrawn from circulation, by the respondents
- (iv) To evaluate the knowledge of polymer currency in circulation in other countries of the respondents
- (v) To assert the level of knowledge on introduction of polymer currency in India and acceptance, if introduced.

**HYPOTHESES TESTING:**

1. There is no association between the set of knowledge variable and willingness to accept polymer currency by the respondents. The following are the subset hypotheses under knowledge variable.
  - a. There is no association between the knowledge to distinguish between a forged banknote from a legal one and willingness to accept polymer currency by the respondents.

- b. There is no association between revenue loss and willingness to accept polymer currency by the respondents.
- c. There is no association between knowledge of recycling of withdrawn banknotes and willingness to accept polymer currency by the respondents.
- d. There is no association between knowledge of polymer currency in circulation in other countries and willingness to accept polymer currency by the respondents.
- e. There is no association between knowledge of RBI's introduction of polymer banknotes and willingness to accept polymer currency by the respondents.

**METHOD AND METHODOLOGY OF THE STUDY:** Being an ex-ante research work, this study has a high weightage on the qualitative variables.

**Sample Area:** The area of study is Chennai City. This city is the fourth largest metropolitan and the 5<sup>th</sup> most populous city in India. The rate of urbanization in this city has been quite drastic but fast; the district of Chennai holds the credit of being 100% urbanized<sup>viii</sup>. On the negative side, this geographic location of the city along the coastal line is a vulnerable port to float counterfeit currency. The city tops the list in the country for forged currency in circulation and floatation. The sample area was stratified into North, East, West, South and Central Chennai and a simple random sampling was adopted. A structured questionnaire was framed. Observation and interview methods were also used. A triangular perspective of banks (the main component to circulate currency among the public), general public as consumers on one hand and merchants on the other was done in the research study. The consumers were further bifurcated into low-income and high-income. The size of the sample was 800. The statistical technique of logistic regression analysis is adopted, which leads to the following model :

$$P(Y_i = 1|X) = \frac{e^{\beta_0 + \beta' X}}{1 + e^{\beta_0 + \beta' X}} = \theta(\beta_0 + \beta' X)$$

where  $\theta(.)$  represents the logistic distribution function. For the logit model, the marginal effect is given by:

$$\frac{\partial P(Y)}{\partial X} = \frac{e^{\beta_0 + \beta'X}}{(1 + e^{\beta_0 + \beta'X})^2} \beta$$

### Model Specification

The logit equation is specified as:

$$Y_i = \beta + \alpha G + \gamma E + \sum_q \omega_q K_q + e_i$$

where

$Y_i$  = The dependent variable which takes value 1 for the respondent  $i$ 's answer is "yes" for the level of willingness to accept polymer currency if introduced in India and 0 otherwise;

(i)  $G$  = gender taking the value 1 if male, 0 otherwise

(ii)  $E$  = Educational level of the respondents taken as number of years of schooling

And,  $K_q$  being the set of knowledge variables wherein

(iii) a dummy defined as 1 if the respondent possess the knowledge of identifying forged notes from a legal one and 0 otherwise

(iv) a dummy defined as 1 if the respondent has incurred a revenue loss, 0 otherwise.

(v) a dummy defined as 1 if the respondent possess knowledge of how banknotes are being recycled, 0 otherwise

(vi) a dummy defined as 1 if respondents are aware of polymer currency circulated in other countries that have adopted them, 0 otherwise

- (vii) a dummy defined as 1 if respondents possess knowledge about RBI introducing polymer currency in India, 0 otherwise;  $\alpha$ ,  $\gamma$ ,  $\omega$  represent the unknown parameters of the explanatory variables and  $\beta$  is the constant.

**LIMITATIONS OF THE STUDY:**

1. This study is based only on the substrate used and the structure that goes to form the legal tender and does not question the legal tender itself.
2. It only tries to find out the opinion of the public on their attitude towards the new structure of currency, if introduced, based on their a priori knowledge or otherwise.
3. The study is carried out in Chennai city and reflects the opinion of the people of Chennai city only.
4. There could be bias on the part of the respondents while answering the questionnaire, which cannot be controlled by the researcher.
5. Being an exploratory study, the results of the study are based on predictions and forecasts.

**ANALYSIS AND INTERPRETATION OF RESULTS:** Based on the information obtained through questionnaire method, the frequency tables relevant to the objectives specified are constructed and given below.

**Table 1 Gender distribution of the respondents**

Gender	Low income	High- Income	Merchants	Banks	Total
Male	142 (71.00)	150 (75.00)	158 (79.00)	170 (85.00)	620 (77.50)
Female	58 (29.00)	50 (25.00)	42 (42.00)	30 (15.00)	180 (22.50)
<b>Total</b>	200 (100.00)	200 (100.00)	200 (100.00)	200 (100.00)	800 (100.00)

Source: Computed by the researcher through primary data collection and figures in () denote column percentage.

The first rule of thought is to understand and assess the different degrees of usage of different denominations for transactions. For acquiring this, the level of willingness between the gender and the educational classification, is displayed in tables 1 and 2 respectively which are self-explanatory. In table 2, though the number of years of schooling was obtained during primary data collection, for convenience and easy understanding, it is split into different categories.

**Table 2 Educational classifications of the respondents**

<b>Educational level</b>	<b>Low income</b>	<b>High-Income</b>	<b>Merchants</b>	<b>Banks</b>	<b>Total</b>
No schooling	46 (23.00)	-	10 (5.00)	0 (0.00)	56 (7.00)
Up to primary	74 (36.00)	-	30 (15.00)	0 (0.00)	104 (13.00)
Up to high school / Hr. secondary	40 (20.00)	8(4.00)	40 (20.00)	0 (0.00)	88 (11.00)
Graduation/Vocational/Technical/Diploma	36 (18.00)	72(36.00)	90 (45.00)	110 (55.00)	308 (38.50)
Higher education/professional	4 (2.00)	120 (60.00)	30 (15.00)	90 (45.00)	244 (30.50)
<b>Total</b>	200 (100.00)	200 (100.00)	200 (100.00)	200 (100.00)	800 100.00)

Source: Computed by the researcher through primary data collection and figures in () denote column percentage.

Table 3 gives an interesting portrayal of the use of denominations by the different sections of the people. As expected, lower denominations are highly used by the low-income group and higher denominations by the high-income group. ₹100 average all denominations in all categories.

**Table 3 - Distribution of respondents using banknotes frequently**

<b>Banknote highly used</b>	<b>Low income</b>	<b>Rank</b>	<b>High income</b>	<b>Rank</b>	<b>Merchants</b>	<b>Rank</b>	<b>Banks</b>	<b>Rank</b>
₹ 10	56(28.00)	1	28 (14.00)	4	48 (24.00)	2	10 (5.00)	6
₹ 20	44 (22.00)	2	10 (5.00)	6	13 (6.50)	6	10 (5.00)	5
₹ 50	42 (21.00)	3	36 (18.50)	5	19 (9.50)	4	20 (10.00)	4
₹ 100	40 (20.00)	4	45 (22.50)	2	59 (29.50)	1	28 (14.00)	3
₹ 500	10 (5.00)	5	50 (25.00)	1	43 (21.50)	3	100 (50.00)	1
₹ 1000	8 (4.00)	6	31 (15.50)	3	18 (9.00)	5	32 (16.00)	2
<b>Total</b>	200 (100.00)		200 (100.00)		200 (100.00)		200 (100.00)	

Source: Computed by the researcher through primary data collection and figures in ( ) denote column percentage.

Let us now consider the individual and overall picture of table 4 relating to the denominations checked by the respondent during transactions. It is a prelude to tables 5 and 6 to aid in having a better understanding on the reaction of the respondents towards banknotes they are handling everyday. High-income group is cautious when transacting with ₹ 500 denomination while merchants play it safe from ₹ 100 denominations. It is mandatory for the bankers to have the knowledge of identifying forged notes physically or otherwise (with the help of the fake-note detector installed in their respective bank branch). However, the percentage levels across the table do not give much lead for a good understanding or a forecast.

**Table 4 – Distribution showing denominations checked during transaction**

Denomination	Low Income	High Income	Merchants	Banks	Total
₹ 10	-	-	-	Mandatory	-
₹ 20	-	-	-	Mandatory	-
₹ 50	-	-	-	Mandatory	-
₹ 100	-	-	13 (6.50)	Mandatory	13 (2.17)
₹ 500	-	88 (44.00)	111 (55.50)	Mandatory	199 (33.17)
₹ 1000	-	24 (12.00)	56 (28.00)	Mandatory	80 (13.33)
Not checking at all	200 (100.00)	88 (44.00)	20 (10.00)	-	308 (51.33)
<b>Total</b>	200 (100.00)	200 (100.00)	200 (100.00)	-	600 (100.00)

Source: Computed by the researcher through primary data collection and figures in () denote column percentage.

Table 5 shows how much a common man can identify legal banknotes from forged ones. Incidentally, majority of the people who are non-merchants cannot identify a forged banknote though they check the denominations while transacting, in case of doubt<sup>ix</sup>.

**Table 5 - Distribution of respondents' knowledge of identifying forged banknote**

Possess knowledge	Low Income	High Income	Merchants	Banks	Total
Yes	49 (24.50)	99 (49.50)	133 (66.00)	Mandatory	281 (46.83)
No	151 (75.50)	101 (50.50)	67 (33.50)	Mandatory	319 (53.17)
<b>Total</b>	200 (100.00)	200 (100.00)	200 (100.00)	Mandatory	600 (100.00)

Source: Computed by the researcher through primary data collection and figures in () denote column percentage.

Table 6 gives a paradox of theory and application. Theory, that is, the knowledge or the prescribed methods of identifying legal banknotes as stated by the Central Bank of the country and put up in every bank branch to aid the common man, does not fall in line with empirical evidence. In other words, it is the “paradox between the economics of information and spill-over effect of knowledge”. The knowledge of identifying a counterfeit banknote must enable an individual in

actually identifying one during times of transactions. But it is not so in reality.<sup>x</sup>. This lack of proper identification can be a loophole for the circulation of counterfeit currency.

**Table 6 - Revenue loss incurred by respondents**

Revenue loss	Low Income	High Income	Merchants	Banks	Total
Yes	46 (23.00)	80 (40.00)	67 (33.50)	N.A.	233 (38.83)
No	154 (77.00)	120 (60.00)	133 (66.50)	N.A.	367 (61.17)
<b>Total</b>	200 (100.00)	200 (100.00)	200 (100.00)	-	600 100.00)

Source: Computed by the researcher through primary data collection and figures in () denote column percentage.

Here, a point to be observed is that though the low-income group also incur a revenue loss, it rarely occurs since most of their transactions are on daily / weekly basis which limits the use of higher denominations. Counterfeit banknotes in lower denominations are comparatively lesser in circulation.<sup>xi</sup> Also their velocity is too high to be traced as forged banknote.

Table 7 tries to determine the awareness level on the part of the respondents that apart from paper currency, banknotes made of a different substrate (full or hybrid polymer currency) also exists and circulates in various countries of the world. Astonishingly, the gap between the low-income and the high-income is not very wide as expected. While the low-income people attribute their awareness level from their kith or kin working abroad as manual unskilled labourers. Merchant group having trade and transaction within and abroad are better informed. While it is expected all banks to be aware about polymer currency in other countries (i.e. 100%) as also they can handle their customer foreign exchange (either on business trips or vacation trips), only 88.5% know about polymer currency circulation. Is general education a boosting factor in obtaining and reaping economics of information, poses a question. Rather, it could be said that learning happens due to exposure and specific education aimed at imparting the importance of currency and its handling, in general.

**Table 7 – General awareness about polymer currency by the respondents**

<b>Awareness</b>	<b>Low Income</b>	<b>High Income</b>	<b>Merchants</b>	<b>Banks</b>	<b>Total</b>
Yes	41 (20.5)	54 (27.00)	102 (51.00)	177 (88.50)	374 (46.75)
No	159 (79.5)	146 (73.00)	98 (49.00)	23 (11.50)	426 (53.25)
<b>Total</b>	200 (100.00)	200 (100.00)	200 (100.00)	200 (100.00)	800 (100.00)

Looking into the association of attributes, namely, the knowledge of the introduction of polymer currency in India with respect to the different strata of the samples, table 8 comes out with what can be termed as ‘learning gap’. The table has some brow-raising facts that are just not interesting but highly surprising with the outcome frequencies. For the quantum of news circulated among the various media, an average of 35% of the respondents falling in the low, high-incomes and merchant categories and surprisingly only 67% of the bank branches knew that such a type of currency exists elsewhere and it will be tried out in India with Rs.10 denomination. More surprise was out of the box when it was found that a majority of the 34% in the low-income group came to know about it through vernacular newspapers. Highly ironical has been the outcome of the study that education and percolation of decisions plays very little role.<sup>xii</sup>

**Table 8 - Distribution of respondents’ knowledge on introduction of polymer currency**

<b>Possess knowledge</b>	<b>Low Income</b>	<b>High Income</b>	<b>Merchants</b>	<b>Banks</b>	<b>Total</b>
Yes	68 (34.00)	70 (35.00)	70 (35.00)	134 (67.00)	344 (43.00)
No	132 (66.00)	130 (65.00)	118 (59.00)	66 (33.00)	444 (55.50)
<b>Total</b>	200 (100.00)	200 (100.00)	200 (100.00)	200 (100.00)	800 (100.00)

Source: Computed by the researcher through primary data collection and figures in ( ) denote column percentage.

Being an ex-ante research work, the respondents were shown with samples of different country’s polymer currencies and provided certain basic information on the proposal of RBI coming out with such currencies in India. The reactions of the respondents obtained are depicted in table 9 below, the expected outcomes, showing unexpected variations. While a majority of the population sample is willing to accept polymer currency, there are some drastic differences in the

perception of welcoming it by the four sections that are grouped for the study. An alarmingly 92% of the low income group are overwhelmed to know that mutilated banknotes can be minimized, 39% of the high-income group feel that it does not make any difference as many are comfortable with cashless transactions (debit card, credit card, e and/or m-transactions). Bank personnel do not want to comment on the decision of the RBI.<sup>xiii</sup>

**Table 9 - Distribution of respondents' reaction of introducing polymer currency**

Willingness to accept	Low Income	High Income	Merchants	Banks	Total
Yes	184 (92.00)	122 (61.00)	100 (50.00)	176 (88.00)	582 (72.25)
No	16 (8.00)	78 (39.00)	100 (50.00)	24 (12.00)	218 (27.25)
<b>Total</b>	200 (100.00)	200 (100.00)	200 (100.00)	200 (100.00)	800 (100.00)

Source: Computed by the researcher through primary data collection and figures in () denote column percentage

Having laid down the overall understanding of the scenario which is required for hypotheses testing, table 10 is a qualitative representation of the research study.

**Table 10 - Determinants of perception of willingness to accept a new structure in the banknote: The Logistic Curve Estimates**

No. of observations	=	600			
LR $\chi^2$ (7)	=	165.11			
Prob > $\chi^2$	=	0.0000			
Log likelihood	=	- 257.02363			
Pseudo R <sup>2</sup>	=	0.2431			
<b>Willingness to accept the change in the structure of legal tender</b>	<b>Co-efficient</b>	<b>z</b>	<b>P &gt;  z </b>	<b>Marginal Effects dy/dx</b>	
Gender	0.3197608	1.21	0.226	0.0483592	
Educational level	0.0690088	3.24	0.001*	0.0097708	

Knowledge of recognizing legal banknotes from illegal ones	1.821193	6.98	0.000*	0.2518465
Revenue loss incurred	1.009388	3.99	0.000*	0.1340438
Knowledge of recycling of withdrawn briquetted banknotes	0.5178139	1.42	0.156	0.0664971
Spill-over knowledge of circulation of polymer currency in other countries	0.0609324	0.25	0.806	0.0085681
Knowledge on RBI's introduction of polymer currency in India	1.036252	2.58	0.010*	0.1242823
Constant	-1.367318	-3.72	0.000	

dy/dx is for discrete change of dummy variable from 0 to 1. \* refers to 1% significance level.

From the logistic regression estimates, it is evident that educational level, knowledge of identifying legal banknotes from forged banknotes, the impact of revenue loss incurred due to accidental holding of forged banknote and RBI's decision to introduce polymer currency in India are highly statistically significant at 1% while other factors are insignificant though have a positive co-efficient. The marginal effects of the explanatory variables signifies the following:

- i. for one year increase in the educational level of the respondent, the probability of accepting polymer currency increase by 0.0097708
- ii. for one person increase in the number of respondents who can identify forged banknotes the probability of accepting polymer currency increase by 0.2518465
- iii. for one person increase in the number of respondents who has incurred a revenue loss the probability of accepting polymer currency increase by 0.1340438
- iv. for one person increase in possessing the knowledge that RBI is likely to introduce polymer currency in our country, the probability of accepting polymer currency increase by 0.1242823

The Pseudo R<sup>2</sup> is 0.2431. It means around 24% of the dependent variable is explained by the explanatory variables. The magnitudes of the test values of the parameters, when compared with

the critical chi-square ( $q=7$ ) for 95 percent confidence levels, show a high level of significance. Thus, the hypothesis is rejected that the coefficients in each set of variables added to the model equal zero. It is concluded that the set of knowledge variables have joint significance in influencing the dependent variable.

**SUGGESTIONS AND CONCLUSION:** From the analyses it can be interpreted that though gender does not play a crucial role, educating the public in general on the values attached to the currency of our country and its treatment while in circulation is important. While the economics behind the introduction of polymer currency in India is to attack counterfeit banknotes might take the forefront, it is equally important for the general public to know the voluminous cost of printing new currencies to (a) replace withdrawn ones (b) adding currency in circulation as per the demand<sup>xiv</sup>, the herculean task and the inherent costs incurred by the Central Bank of just not printing banknotes, but distributing them to various parts of the country. Some of the inherent costs are stacking cost, transportation cost, distribution cost etc. A thorough knowledge by the citizens on the amount of money involved in issuance and withdrawal of banknotes into and from circulation can go a long way in reducing the printing cost of the currency. Also, recycled products from shredded and briquetted banknotes are hardly known to the common man. The reason behind it should be probed and the concerned authorities can think of marketing such products as done in other recycled products. The same will hold good even if the substrate happens to be polymer. The environmental friendly way of using such wastes, be it any substrate (either paper or polymer) requires attention and consideration else the principle of sustainable way of waste management in an environment-friendly way will take a back seat. The wastes of banknotes being used as landfills may not be palatable in the long run in terms of environmental economics. Nevertheless, banknote printing itself plays a dominant role in the money supply part of monetary policy. Curtailing its printing cost will definitely be a supportive factor for the policy makers in terms of monetary policy.

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#### **ENDNOTES**

<sup>i</sup> Barter system was prevalent in the primitive ages which had to give way for some other standard form due to its inherent problem of double co-incidence of wants.

<sup>ii</sup> Needless to say, counterfeiting has known to be the other side of the legal tender since days it evolved to facilitate transactions for human beings.

<sup>iii</sup> Refer Maity S.K., "Early Indian Coins and Currency System" for a detailed history and description of origin of coins of various shapes and sizes, and the origin of currency system in India.

<sup>iv</sup> To counter this problem, coinisation of banknotes has been regularly adopted in India. ₹1, ₹2, ₹5 and ₹10, which were in circulation as banknotes are now coinised. Except ₹10, all other denominations are only in coins.

<sup>v</sup> RBI, in December 2014 has reiterated the introduction of polymer currency in India in 5 cities namely Cochin, Bhubaneshwar, Mysore, Jaipur and Shimla on a trial basis to tackle the problems of (a) short lifespan on paper banknotes, (b) to fight counterfeiting, (c) polymer currency notes can be produced 10 times faster than paper banknotes, (d) to tackle the problem of unfit notes due to scribbling, humid conditions etc. and (e) to recycle the withdrawn banknotes in a useful

way as unused polymer banknotes can be recycled easily. For detailed information, refer to RBI reports.

<sup>vi</sup> Two vital points need special mention here. (1) Countries like Sri Lanka and Bangladesh also introduced polymer currency but later resorted to paper currency of those denominations that were in polymer. Banknote printing costs are a huge expense to any government. Withdrawing the printed banknotes will only add fuel to the fire in addition to its contribution to withdrawal cost. (2) When ₹5 coin of lighter weight and size was circulated in India, people gave the feedback that it was hard to distinguish it from ₹1 coin. The RBI has quoted this, which were in various media as well. Ultimately, ₹5 coins that will overcome this hurdle had to be minted by the concerned authorities.

<sup>viii</sup> Census of India – 2001 & 2011 reports.

<sup>ix</sup> Merchants take extra precaution while transacting with banknotes while common man generally does only in times of doubt, especially if it happens to be a new currency note, and if they sense any abnormal feeling on the thickness of the banknote.

<sup>x</sup> The primary data coincides with the Secondary data. Refer to RBI reports for the same.

<sup>xi</sup> Another notable feature is among the high-income group; it was found that a higher percentage of revenue loss was mainly due to cash withdrawal from ATM machines as they tend to use their cards (debit or credit). Carrying cards is easier for them than holding cash.

<sup>xii</sup> It is here that the theories of economics of information and economies of scope come into play in this study.

<sup>xiii</sup> Their doubts however linger on the facility of stapling bunches of banknotes during disbursement as they are advised not to do so in bunches of paper currency. Nevertheless, various literature does not support (rather not mentioned) on stapling polymer currency bunches.

<sup>xiv</sup> Supply of banknotes is decided through various factors like the population increase, the velocity of circulation of a particular denomination, money supply in the economy in general, the inflation rate, growth rate of the economy etc. by the RBI / Finance Ministry. For further information, refer to RBI reports.