Rupee Demonetization (Dn): Real Need for a Balanced Evaluation

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ABSTRACT

The November 2016 Dn of the rupee is a phenomenal event in India's monetary history. Instead of generating discontent and uproar, Indian democracy has virtually endorsed it. It is evidenced in post-Dn election results and by the relatively high degree of compliance with new business regulations and rules related to General Sales Tax (GST). This paper sets out to compile and evaluate the positives and negatives of Dn so that one can get to know the net outcomes, including in the area of behavioral economics. It also examines whether it would be more appropriate to treat Dn as work-in-progress and wait and watch before pronouncing a verdict. Incidentally the paper also examines the implications of digitizing payments and reducing dependence on cash.

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Demonetization (Dn) world-wide

In a matter-of-fact way several countries have undertaken demonetization (Dn) of varying scale and severity with diverse objectives. Table 1 below is a partial list of countries that tried Dn with capricious outcomes, if not success in achieving the objectives of curbing tax evasion and illegal activities.[1] Human ingenuity being what it is, it could set at naught the objectives of such monetary initiatives. Operators take advantage of loopholes to launder tax-evaded dirty money into legit clean money. Against this backdrop of general failure of Dn to achieve stated objectives, let us examine the evidence in India regarding the November 2016 rupee Dn, and whether the outcomes resonate with those of other countries or there has been a modicum of success in India, or whether the jury is still out and it is too early to tell in the area of Indian behavioral economics.

Table 1 Demonetization in Recent Years and Outcomes

	Country	Year	Result	Overall Conclusion
1	Ghana	1982	Made economy weak. Unsuccessful	People continued to support the black market and resorted to investment in physical assets.
2	Nigeria	1984	Economy collapsed,	Debt-ridden and inflation did not take change well.
3	Myanmar	1987	Unsuccessful	Led to mass protest resulting in killing of many people.
4	Soviet Union	1991	Unsuccessful	People did not take change positively due to poor harvest.
5	Australia	1996	No side effects	As the purpose was only to replace paper with plastic.
6	North Korea	2010	Weak, unsuccessful	People left with no food and shelter
7	Zimbabwe	2015	Unsuccessful	Face value of one hundred trillion dollars dropped to $0.5 dollar.
8	Pakistan	Dec-16	Rs. 5000 bills retired. Cannot predict effect	People have ample time to get their note exchanged.

Source: Adapted by author from Ambalika Sinha , Divya Rai, Aftermath of Demonetization on Rural Population, *International Journal of Research in Economics and Social Sciences (IJRESS)* Available online at : http://euroasiapub.org Vol. 6 Issue 11, November - 2016, pp~223~228

India's Notebandi

This paper examines the aftereffects on India's economy and what it forebodes. Most analysts, depending upon their ideological standpoint speak of either the upside or the downside. A balanced picture is attempted here. The basic fact however is that the good and the bad effects of

Dn will linger on for a year or more even as it continues to bring about structural economic changes along with GST and other administrative and legislative measures to improve economic efficiency, reduce transaction costs and otherwise streamline all economic activity. There are also attempts at nudging the public, 99% of whom do not pay income tax, to adapt behaviorally to a new economic reformative milieu.

Much has been written about the “disastrously botched,” poor and “clumsy” execution of this bold step in India’s perpetual hunt for black money and corruption: long lines at the banks in the initial months after the announcement, the abysmal helplessness of the poor who were particularly dependent on the lifeline of cash, the constantly changing rules and goalposts in what appeared as “learn as you go” implementation especially of remonetization. Farmers could not buy seeds for new crops. Many office goers had to decide either to forego salary for a day or wait in line at banks to deposit cancelled currency.

Dn was stunning in scale, scope, and was also ground-breaking. It was arguably the largest event of its kind in India’s monetary history, withdrawing ₹500 and ₹1000 denomination currency notes as legal tender. The two notes did the heavy-lifting obligations of the role of money as of medium of exchange, store of value, unit of account and means of deferred payments. The two bills accounted for a massive 86 percent of total currency notes in circulation. No one seemed to hear the Prime Minister plead for the 50-day period of fine-tuning and restoring supply chains to refurbish a semblance of normalcy to the markets. The nature of implementation of Dn appeared somewhat flawed because of the need for keeping the entire move under utmost confidentiality to prevent leaks lest it should unravel, thereby reducing the potential for success in mopping up tax-evaded, illegally or unethically gained cash.

Effects of Liquidity Shock

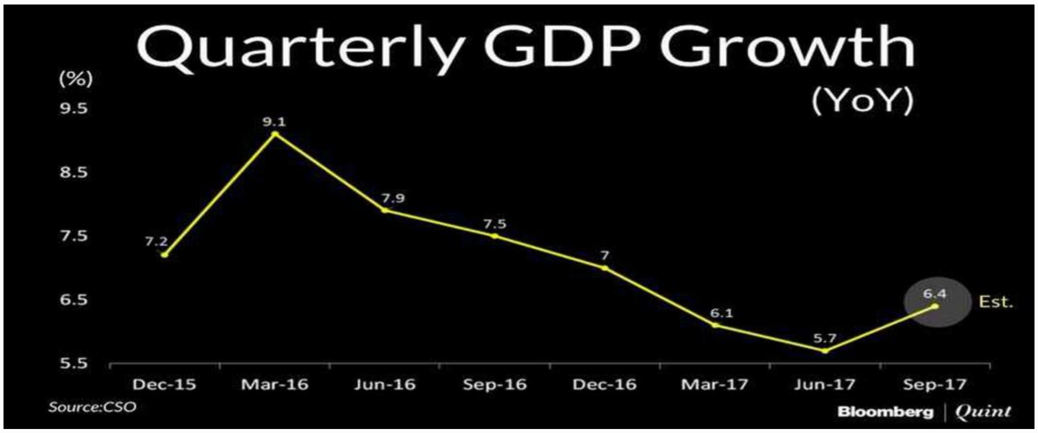
The liquidity shock of Dn was caused by the big gap left in the intermediate range of payments between a small denomination ₹100 and large denomination ₹2000 by the retirement of notes worth ₹500, constituting 49% of money supply and ₹1000, being the other 37 %. Adding to the chaos was the delay in replacement of old notes with new notes, dysfunction of ATMs, disruption in banking, and the pupation period for the payment mechanisms to emerge fully-fledged as a legit and mature payment system. Fig. 1 below gives the quarterly GDP chart.
In no small way did the disruption contribute to curb and constrict agriculture, construction, production, real estate business, jewelry, garment manufacturing, bus transportation, workshops and repair shops, and the economy as a whole. Black money facilitates much of construction, luxury goods, real estate, liquor, tobacco and other business.

As shown in Fig. 1, GDP growth rate fell from a high of 9.1 percent in the 2015-16 Quarter ending March 2016 to 6.1% in the same Quarter of 2017, and further down to 5.7 % during the Quarter ended June 2017. In the Quarter ended Sept. 2017 the growth rate has picked up and has reached 6.4 %. Overall GVA for the April-June 2017 Quarter was 6 % compared to 7.6 % in same Quarter of 2016. The RBI, World Bank and the IMF and others have more cheerful forecasts as we shall see soon.

Causes for GDP rate Decline

The declines in GDP cannot be attributed entirely to Dn. There is first the direct impact of the July 01, 2017 roll-out of General Sales Tax prompting businesses to destock inventory in June 2017 prior to price relabeling.[2] Second, there was a refiguring of wholesale prices. Third, the declining trend began even before Dn in November 2016, some three quarters earlier beginning in March 2016 as shown in Fig.1. Fourth, the unorganized sector, with all its merits, is not a paragon of compliance with rules and regulations. So the impact was far worse on the cash-based

Figure 1: GDP Growth over 8 Quarters



unorganized sector. It overlaps with the underground economy. Real estate business came to a standstill and lost buoyancy. "Pagadi" or rent-seeking behavior is on the wane. The demand for paying half the purchase price of apartments "in black" is gone contributing to substantial decline in business. Many weddings were cancelled. Much cash was shredded or even burnt. On the plus side, this is a significant behavioral change. Without Dn and GST, the lurch towards less unethical ways in real estate and other businesses would have been inconceivable. As incomes (mostly in the unorganized sector) fell consumption regressed too. Job losses were there prompting critics to claim that the far-reaching monetary event was anti-people. But the real fact is that unemployment had hit the lowest rate by then as Table 2 and Fig. 2 show. Second, such censure ignores the fact that a majority of people did not accept corruption as a way of life even after suffering it for decades, and were desperate for cleaner public life. The underground economy which is the sustainer and regenerator of tax-evaded money often overlaps and makes over into the informal unorganized sector. The conundrum here is that about 30-40 per cent of Indian economy is based almost wholly on cash. Dn did paralyze this sector, in particular the rural folk accounting for over 65 percent of India's population. This factor too accounts for the quarterly GDP shortfalls. Also an accurate trend cannot be deciphered without deseasonalizing the data. Quarterly GDP data can be exponentially smoothed for seasonal factors. Time series data would then become more reliable for nowcasting and forecasting.

In its Annual Report for 2016-17 the Reserve Bank of India has reported that Dn was a one-time event and its impact has been transient. Consumption, both Government and private, have been buoyant. RBI states "the Indian economy demonstrated resilience in 2016-17, marked by moderate expansion and macroeconomic stability - low inflation, and improvement in current account and fiscal deficits." The outlook for economic growth during 2016-17 has brightened.[3]

Table 2 Labor and Unemployment Data

India Labor	Last 2016	Previous 1983	Highest	Lowest	Unit
Unemployment Rate	3.46	3.49	8.30	3.46	Percent
Employed Persons	29650.00	28999.00	29650.00	17491.00	Thousand
Unemployed Persons	44.85	48.26	48.26	5.10	Million
Labor Force Participation Rate	52.50	50.90	52.90	50.90	Percent
Population	1299.00	1283.00	1299.00	359.00	Million

Fig. 2 Unemployment Rate[4]

"Ease of doing business" was also contributing factor. The World Bank estimates that GDP growth in 2017 would be 7% and 7.3% in 2018. IMF also thinks that the recent slowdown is short term. Growth rate for 2016 was 7.1% and the projection for 2017 is put at 6.7% and for 2018 at 7.4%.[5]

The grim forecast of a sharp drop in the rate of growth of India's GDP due to cash shortage has not come true. What in fact happened is a one percent decline in GDP growth rate during the quarter ended June 2017.Long-term growth prospects are much better. T. C. A. Anant states, that comments about the effects of Dn on the economy do not stand up to statistical scrutiny. In January 2017 he had announced that growth during fiscal 2016-17 would be a healthy 7.1 percent which is far above what was expected.[6]

Growth Prospects

Growth prospects have considerably improved because of six or more factors:

1. One of the most growth-stimulating budgets for 2017-18 aiming to increase expenditure
2. Nationwide Goods and Services Tax (GST) complementing the formalizing impact of Dn
3. Sizable increase in foreign direct investment due to better sentiment, India climbing the ranks 30 rungs for "ease of doing business" as per World Bank criteria of deregulation.
4. A very confident Reserve Bank of India letting the interest rate stay pat at 6.25 percent instead of hiking it as expected—because there has been no outbreak of inflation in the economy despite recent back-to-back droughts. Consumption has declined by 6.7 % during April-June 2017 compared to 8.4% during the corresponding period of last year. Investment too has fallen.RBI is constrained economically and politically to keep the inflation rate down, even cut it down from around 5.5 percent to 4 percent max.
5. Sovereign ratings of India by credit agencies like Moody's has gone up (Baa2 on 11/17) and other agencies like S&P are expected soon. Cost of borrowing abroad will therefore be down by several base points.
6. Digital payment facilities are increasing by leaps and bounds and so also the digital transactions which can happen 24/7 enabling persons to shop till they drop. Consumption and investment expenditure would then trigger faster growth.

More recently, Arvind Subramanian has expressed optimism that GDP growth would resume at a much higher level of 8.5 percent if: a) Demand picks up b) Restrictions on large transactions are eased and c) There is recapitalization of banks after minimizing bad debts they were burdened with.[7] There is a measure of dynamic scoring here, reckoning that the momentum of growth would have beneficial exogenous effects radiating on the economy. Arvind Panagariya has also mentioned more or less the same rates.[8]

Assuming India's black economy is about a quarter of the overall economy, and given that the GDP is $2.264 T (for 2016 at constant 2011-12 prices) there has to be a substitute medium of exchange for about $566 billion of economic activity that has so far been sustained by the tax-evading and/or informal segment of business. Hitherto, the informal sector has operated on mostly cash basis and does not generally comply with the laws of the land in regard either production, distribution, commerce or any other aspect of business. After remonetization and after GST, liquidity has returned to this sector and has also been supplemented by digital payment modalities. Digital systems and GST help trace such business activity making Indian economy more inclusive. This is a major gain. Digitization is being dealt with at the end.

Positives and Negatives of Dn

Vast sums have flowed into the banks, quite a windfall, considerably improving bank liquidity. The negative results were no doubt grave, as noted earlier. Dn shut out a whole lot of cash-based activity in the informal penumbra area of business. There were also dramatic revelations of caches of unaccounted money which got either deposited in the banks before the expiry dates for deposits of currency withdrawn from circulation. Some large amounts were distributed on trust and some amounts of currency were allowed to rot or dropped in temple hundis, or even shredded. One of the main objectives of the Notebandi was to uncover black money hoards and this was achieved to some extent, though much less than 100 percent. Who knows its real magnitude anyway? Conversions into real estate are still being caught by government investigators. New laws are coming up to assess unaccounted and benami property, putting fear in such owners. Nobel Laureate Kailash Satyarthi pointed out that there was a sharp drop in human sex trafficking. Black-money and counterfeit currency have funded stone-pelting in Kashmir on law-enforcing forces. This came to an abrupt end. How do we quantify these benefits in monetary terms?

Modelling the Dn as it relates to the Indian economy is not easy as in physics with basic parameters in steady state. Models cannot capture atypical change of the Dn type. Survey of literature did not help with even an inkling of how economic changes triggered by events like Dn could be correlated to real world phenomena. There is hope only if fluctuations occur within a narrow band of the steady state. By its very nature Dn creates chaotic and random if not capricious movements caused by non-normal or not always rational human behavior. This non-deterministic nature plays truant in modelling. This author will continue to make attempts to come up with a financial model that would do justice to at least a segment of the market like real estate. In all probability it could happen in the next paper.

Deposits of over ₹250,000 were put under the scanner to demand payment of the penalty of 200 % of the amount of tax due. By tracing such flows to individuals and firms the enforcement authorities have been able to discover unaccounted amounts to the tune of ₹17,000 crores gathered from 58,000 bank accounts belonging to 35,000 deregistered companies. 224,000 companies have been classified as shell companies on account of non-compliance with post-Dn regulations. 1,773,000 suspicious cases have been identified that do not match the tax profile. Deposits worth ₹ 368,000,000 million are under scrutiny. Over 300,000 directors have been disqualified for the same reason.[9] No doubt there will be long litigation and the Government may not have the wherewithal to press them. Be that as it may, even if Dn has just nudged people towards better tax compliance and economic behavior that could be regarded a major achievement. Similarly rent-seeking and corruption especially in areas such as real estate have come down visibly.

Among non-monetary benefits, besides behavioral change, over the longer run, there have been several more such as the reduction in violent political agitations. There are serious problems of evaluating these benefits in monetary terms so that such amounts serve as the benefits (numerator) to be divided by the costs (denominator) to figure the cost/benefit ratio for Dn.

Tax-evaded Money Uncovered

If black money is 25% of GDP of $2.264 T, what part of $566 billion was mopped up? Another interesting question is: Is GDP data exclusive of the contribution of the black economy? Manifestly it is not; otherwise it would have been trapped in the tax net. Is $2.264 T an underestimate if the economy were to include the black economy? (Karl Popper: All knowledge is conjectural, especially with regard to Indian economy, subject to revision.)

The RBI Annual Report mentioned earlier has announced that about 99 percent of the demonetized currencies had found their way back to the banks. Almost all of the estimated ₹15.4

lakh crores ($242 billion) in high-currency bills removed from circulation has returned to banks, the actual being ₹15.28 lakh crores. This means that directly or otherwise the notes returned and got exchanged for new notes or just got deposited. There are caveats here. First the tax-evading world includes both the all-cash world (up to 7 percent of the total,) as well as the in-kind world, in the form of bullion, real estate, and other assets. Second tax-evading money found ways to convert itself to clean money by employing mules and proxies for deposits, and benami purchases using backdated bills, and through collusion with bank officials. Dn would have to be followed up by other measures to trace black wealth. GST and other taxes could help tackle that. In this limited sense of scooping up funds of black money Dn has been a success.[10] In the future, in the absence of black money, Dn and digitization would serve as a great equalizer, everyone hopefully contributing their fair share of taxes according to their incomes and wealth. However in the absence of farm taxation, agriculture could continue to provide a tax haven to the rich.

Dn delivered sizeable new liquidity to banks. The Government took advantage of this windfall and approved recapitalization of Public Sector Banks (BSB) in a front-loaded manner. The total allocation for this purpose is ₹ 2.1 trillion. It comprises of budgetary provisions (₹ 181 billion), recapitalization bonds (₹ 1.35 trillion), and raising of capital by banks from the market while diluting government equity share around ₹ 580 billion impact on black money.[11]

In any discussion of Dn, it is but natural to look at the efficiency of monetary policy transmission, one of the least-discussed matters. In the US the Duffie-Krishnamurthy Dispersion Index of money market rates purports to measure pass-through efficiency.[12] Typically a change in interest rates should be reflected in all money market rates such as rates on deposits, CDs, lending to households and businesses, to government and interbank lending. Friction-less pass-through transmission with low DK Dispersion Index is essential to achieve objectives for inflation and growth. It is easy to suspect that in India tax-avoiding unorganized sector could raise the Dispersion Index. As such the need for such an Index in India acquires new relevance.[13] In its absence there is the real possibility Dn or GST get scapegoated for any economic illness.

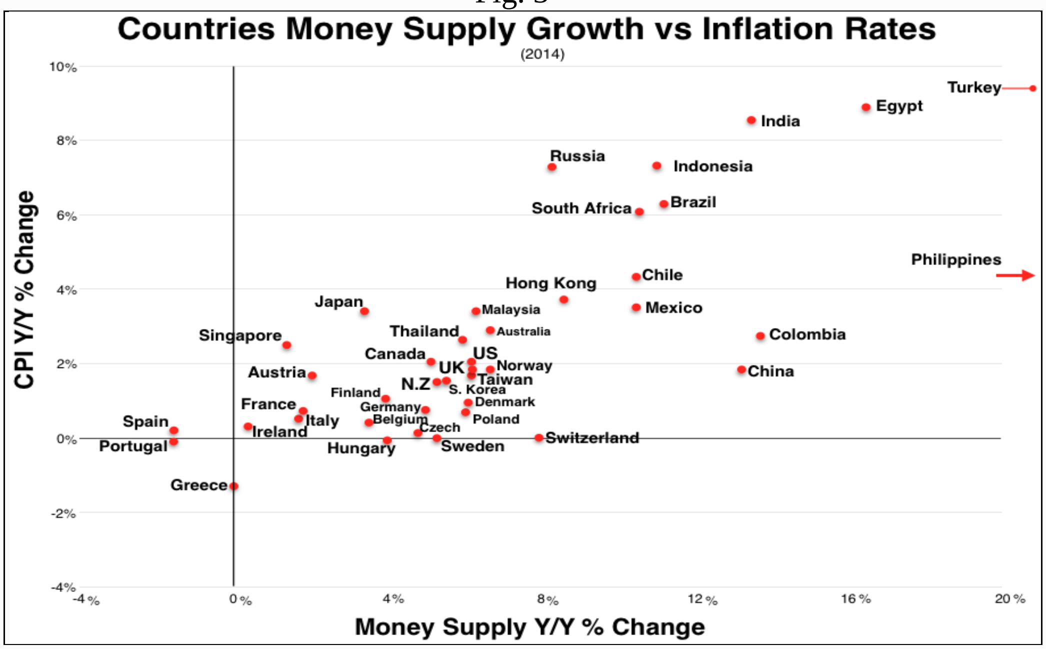
Currency in Circulation and other concepts of Money

Currency in circulation is 12% of Indian GDP. Some 86% of the 12% or 10.32 % was withdrawn. The plus point is a substantial part of the informal sector got financialized enabling monitoring. Bank liquidity improved substantially and brought down lending rates. People use rupees every day, but that amount is a fraction of the money in circulation. In India the measures of money supply are as follows:

M_1 = Currency held by public (C) + Demand Deposits (DD) + Other Deposits with RBI (OD)
M_2 = M_1 + Savings Deposits with Post Office Savings Banks (SD)
M_3 = M_1 + Time Deposits with Commercial Banks (TD)
M_4 = M_3 + Time Deposits with Post Office Savings Banks excluding NSC (National Savings Certificate)

A major plus is an appropriate rein on money supply in recent years. This has enabled better management of business needs. It also checks on inflation. And yet, as Fig 3 below shows there has been year upon year money supply growth in India of around 14 percent with inflation rates around 8 to 10 percent. In many other countries money expansion is at the same rate as in India, but the inflation rate is just 2 %. (Fig.3). Possibly, tax-evaded money or the informal economy may explain relative higher inflation. The new inflation target mandated by the Government to the Monetary Policy Committee of RBI is 4%, not the glide path of current 8% → 6 % → 4%. It is also the mandated target for four years.[14] Inflation targeting just got a bit easier with the reduction of currency in circulation as well as by the increasing switch to digital payment systems. Considering that the number of points of sale (POS) has more than doubled in just one year soon after Dn, what is the reduction in currency in circulation? It is difficult to say considering that some are debit card-like, a payment facility that can be used after a deposit with the issuing bank. Others are credit card like, more in the nature of a loan that could possibly increase spending capacity.

Fig. 3[15]



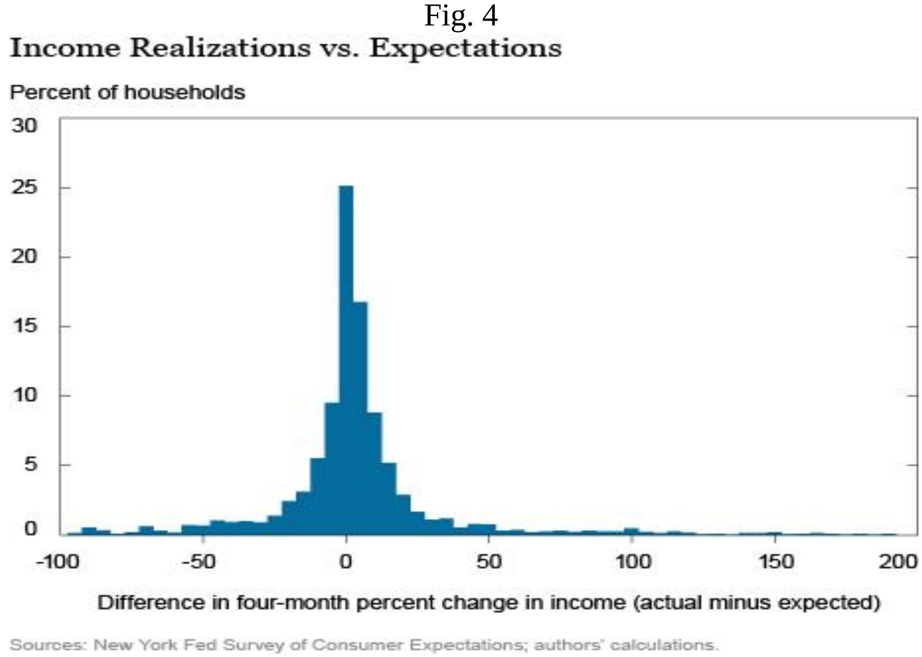
A debit-card like payment facility is part of a deposit that could be part of M_3. What is the impact of payment facility on velocity in circulation? What will be the new velocity in circulation, how much more than 1.3, the RBI rate? In 1960 velocity was as much as 4.464. Broad money as percent of GDP went up from 22.4 to 75.6 %. There is reason to believe that Dn and digital systems do bring down broad money as percent of GDP to less than 75%. This author believes that considered responses to these queries would help approximate, if not quantify the key parameters such as money supply and velocity of circulation.

Loss of Incomes

For a sizeable number the workforce incomes are not always steady and do vary. (Fig. 4) Regardless of whether people adjust their consumption or even compromise on their standard of living, basic bills have to be paid. The fact of adjustments however difficult is a fact of life, however much unpalatable due to loss of jobs, loss of business, flood and other natural catastrophic losses, both expected and unexpected as shown on the left of the graph, and positive changes such as bonuses and pay-rises, on the right of the graph. In the west it may be normal for the typical worker to change jobs. Fig. 4 data may be somewhat true of people here too or it may not be so in India to a varying degree.

One of the reasons for relative calm even after the upheaval of Dn is the fact that earnings of households and individuals in India also do vary as between actuals and expectations. New York Fed Survey of Consumer Expectations (Fig.4) shows that both pleasant and unpleasant changes in income (actual minus expected) occur to households sometime or the other.[16] There is zero change in incomes in the case of only 25 percent of households, and for the rest of the 75%, it changes seven times during the first ten years, which is about two-thirds of the person's career total.[17]

Fig. 4



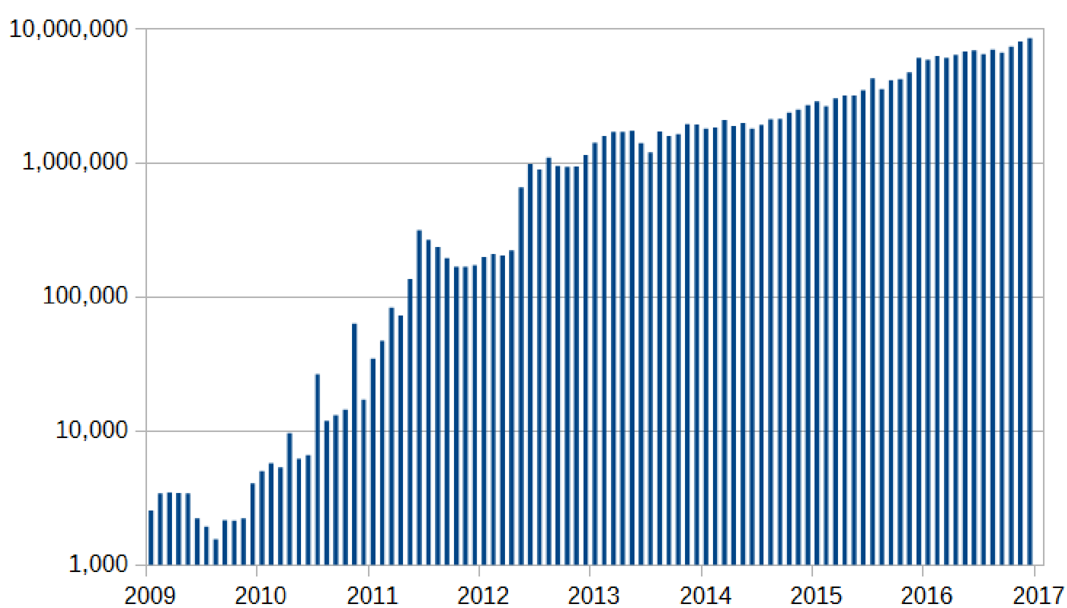
More Positives than Negatives

What most observers were not ready for was the ease with which the Aam Admi (the common man) everywhere came to accept despite the discontent. Dn was agreed to as a necessary disruption in order to: (1) Reduce black money so that the massive disparity between the rich and poor could be alleviated, if not eliminated. (2) Rein in terrorist activity. (3) Curb illicit money that is flooding border states like Punjab and Rajasthan with addictive meth and heroin. (4) Prevent financing of other antisocial and anti-democracy rackets such as vote-buying and political donations. (5) Increase tax compliance and bring more revenue to the Indian government. The Finance Minister Arun Jaitley believes that in terms of achieving major objectives such as a less cash economy, digitization, formalization of the economy, widening the tax-base, formalization of the unorganized sector, clamping down counterfeit currency and so forth Dn has had extremely positive outcomes.[18] At least some of these benefits from Dn were unintended and even serendipitous. Most Indians are convinced that with a strong leader at the helm it is possible to take tough initiatives to curb black money. Top European Commission officials think that Dn would strengthen the economy. If economists are divided about the pros and cons of Dn, it is because of the work-in-progress nature of the initiative. Some gains and suffering are instantaneous and others are long term.

The deficiencies in implementation do not however detract from the rationale for Dn. A groundswell of authentication of the radical move has come from Kenneth Rogoff to achieve objectives such as: a) reduce corruption and curb terrorism b) curb traffic in humans and such other undesirable activities c) digitize transactions so that regulatory authorities can overview suspicious trails of money flows and d) make rapid advance towards a minimal-cash economy with no big denomination currency. It shows how high-value currency can be phased out of the economy. Rogoff believes that there is an increasing trend towards digital payment systems including credit cards, and yet currency in circulation is pretty large. Where is the justification?[19] Problems related to stimulating consumption expenditure with the help of a zero lower bound (ZLB) as during the 2008 recession are relevant. However, for post-Dn India issues such as liquidity trap, ZLB, interest rate reduction issues and the like are neither warranted nor relevant. Banks are already flush with cash balances and many of them are using such surplus to reduce lending rates, engineer robust capital structures and rid their balance sheets of non-performing debts or assets which are about 19 percent on average Notebandi will not eliminate all ills, but at least India will start addressing those issues more seriously.

When transactions are conducted on the basis of digital information rather than banknotes and coins which are legal tender we enter the cashless economy. There has been general perceptible trend towards cashless societies where is cash is replaced by cash equivalent digital credits. There is nothing material by way of payments other than debits and credits to someone's bank account. Bitcoin, a private cryptocurrency, which has no federal reserve to administer it, comes with computer network nodes to enable payments and receipts, called the wallet. It is also emerging as one of the cash substitutes, and despite many governments shunning it, it is getting

Fig.5   Number of Bitcoin Transactions



popular as reflected in its current price of $10,000 or more per Bitcoin as against $22 per Bitcoin in 2013.(Figures.4 and5) PS: In just two months Bitcoin price has doubled (on 11/30/2017) to $10,000) With such sharp increases it is being held by many more for investment purposes, than for purchases, small or big.[20] The problem is North Korea and such like under severe sanctions mine Bitcoins to pay for their imports and undertake other activities. China accounted for 90% of Bitcoin trading and computer-based mining. But in February this year it banned the cryptocurrency for fear of losing control of a fast-growing economic activity. Since then China's share has come down to 10% on 09/17/ 2017. Many observers ask: Is Bitcoin a bubble ?

How About a Formal and Digitized Economy?
One of the most surprising upsides of Notebandi has been the speed with which digital payments are gaining acceptance in the masses. Given that, this move practically forces financial inclusion. Thanks to the push towards digital finance, even those poor who have been traditional outcasts in

Fig. 6. Prices of Bitcoin Jan-Decer 2017

The price of a Bitcoin January-December 2017. (semi logarithmic plot) Today's price $9888.

Source for Figs.4&5 .History of Bitcoin available at http://gikipedia.org/wiki/Price%20of%20bitcoin and OK Google.

the realm of personal banking—roughly 12 percent of the population—are enabled to participate in the formal economy and learn pecuniary smarts. The trend is getting stronger thanks to the authentication provided by Aadhaar ID cards, which now number more than 1.1 billion for India's 1.3 billion. The results in Table above show that the trend towards digital payments has been accelerated by Dn. Check payments in value had the lowest growth of 2.9 % in value. Growth in card usage at points of sale was the largest at 93.83 percent and in terms of value it was 82.98%. Real Time Gross Settlements (RTGS) had an impressive growth of 14.6% for volume and 20.36% for value. Retail Electronic Payments (REP) growth was 40.76% and 51.95% for volume and value respectively. Despite these sizeable differences, matched pair test shows that there is not enough evidence to reject the hypothesis of equality of means in the first and the third columns (Test t -1.3748, Critical t ± 2.3646, and P-value = 0.2116) as shown in the plot below (Fig.7)

To be sure, there are certainly enough hurdles, especially in India, that could make going significantly cashless fanciful, if not unattainable. The system requires a certain amount of sophistication and faith that may be hard to come by in the lowest strata of economic class; not to mention logistical challenges of shifting such a huge mass of population into a digital economy. Not all street vendors will invest in POS hardware. And then there are issues of cybersecurity where even one bad incident can spook millions of those living hand-to-mouth. Critics who doubt the prospects of a cashless economy in India abound, and perhaps with good merit. But as of now, the results are palpable. Maharashtra government is going for a cashless payments system for fees, fines and taxes. The same Government is introducing BHIM-Aadhaar biometric Pay app in rural areas. It will also continue with existing credit card and other modes of cashless system. Street vendors and auto drivers are switching over to digital wallets with payments going

Table 3

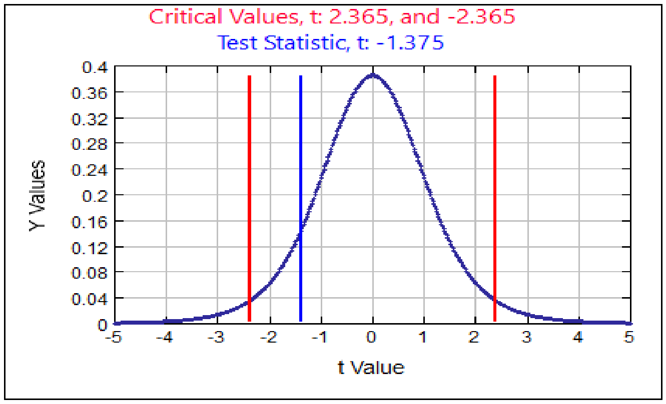
Table 4: Summary Results of Mean Equality Test for Pre-demonetisation, Demonetisation and Post-Demonetisation Periods

Payment Category		Monthly Average			Mean Equality Test Results
		Pre Dem ($\bar{x}_1$)	Dem ($\bar{x}_2$)	Post Dem ($\bar{x}_3$)	
Cheque	Volume	88.50	119.88	97.45	$\bar{x}_1 < \bar{x}_2 = \bar{x}_3$
	Value	6623.86	7095.49	6819.41	$\bar{x}_1 = \bar{x}_2 = \bar{x}_3$
Retail Electronic payments	Volume	306.93	391.57	432.04	$\bar{x}_1 < \bar{x}_2 = \bar{x}_3$
	Value	9087.21	12950.59	13808.39	$\bar{x}_1 < \bar{x}_2 = \bar{x}_3$
Card at POS	Volume	192.53	406.56	373.18	$\bar{x}_1 < \bar{x}_2 = \bar{x}_3$
	Value	390.37	726.52	714.29	$\bar{x}_1 < \bar{x}_2 = \bar{x}_3$
RTGS	Volume	8.49	9.54	9.73	$\bar{x}_1 = \bar{x}_2$; $\bar{x}_1 < \bar{x}_3$; $\bar{x}_2 = \bar{x}_3$
	Value	74410.61	87531.27	89561.59	$\bar{x}_1 = \bar{x}_2$; $\bar{x}_1 < \bar{x}_3$; $\bar{x}_2 = \bar{x}_3$

Source: Sasanka Sekhar Maiti, Mint Street Memo No. 07, From Cash to Non-Cash and Check to Digital, The Unfolding Revolution in India's Payment Systems, available at https://rbi.org.in/Scripts/MSM_MintStreetMemos7.aspx[21] Data in Table 2 have been derived using a linear regression model and applied to time-series data separately for volume and value. The first three periods relate to volume and the last two to value. Details of the model are mentioned in source cited. The data relate to the following periods:

Apr'05-Feb'08	Mar'08-Oct'15	Nov'15-Aug'17	Apr'05-Oct'08	Nov'08-Aug'1

Fig. 7: Matched Pair Test Results



Source: S. Char (2017) based on data in Table 3 above.

directly to their bank accounts. Since Notebandi was initiated, PayTM alone, the largest digital payments company, signed up some 20 million customers in just about a month, bringing its total number of customers to a sizeable 177 million. The growth would have been more but for its connection with the Chinese company Alibaba, the single largest shareholder. At this rate India will go significantly cashless sooner than most other countries and could be the first third world economy to successfully undergo the digital revolution. This is no small achievement for an emerging economy with a sizeable illiterate and a much larger apathetic population. What are the implications of such a shift towards a cashless economy for Indian business and economy?

First there is the inclusion of vast sections of people and also vast unmonetized areas of the economy, enlarging the tax base, additions to quantity of money of legitimized ex-black money, less utilization of real estate as a buffer for inflation and as long-term investment. There will be more inclusion and more democratization. New trends may emerge in finance management for both households and business. Will the burgeoning cashless economy lead to better working capital management as well as less investment in non-performing assets?

Tertium Quid

The costs of Dn have been evident and this is because of the very nature of the Indian economy with a sizeable tax-evading economy which had become something of a way of economic life. It had embedded itself in every segment of the economy including religious places. There were many who wanted this pattern to continue or were apathetic and there were many more who wanted the cancer surgically chopped out in public life. The latter had zero tolerance for such economic behavior. Also it would be hypocritical to disparage Dn as anti-people and remain serene about corruption which citizens suffered for decades and which discouraged business, and even charity initiatives and entrepreneurship. Serendipity has helped too with rapid digitization of payment systems and making the economy more formal and inclusive making it more difficult to be noncompliant. Now that business comes to know where policy chips may fall, and their pattern, there will be brisk investment activity.

While dealing with the costs of Dn one cannot ignore that the declining trend in output had already set in even before November 2016. It is possible that Dn accentuated it. The same is true about job losses and unemployment. Again the trends are heading north after taking in their stride issues such as the new price-labeling in post-GST period, the confusion caused by wholesale price index changes, the liquidity crisis due to delays in making available new cash, malfunctioning of ATMs, and other hobbling hindrances.

The conclusion is that Dn and other economic measures have the character of long-term measures with a gestation of about 2 years. They defy modelling and coming up with a template. The far-reaching measure is still work-in-progress. There is as yet no finality due to dynamics of the Indian economy and its performance. Overall there are more positives and gains than negatives. It would be hasty to draw conclusions yet. In December 2016 within a month of Dn *The Economist* had predicted "a sharp economic slowdown." It put Dn on trial and passed its impeaching sentence: "Dn is a cautionary tale of the reckless misuse of one of the most potent of policy tools: control over the economy."[22] Whatever evidence has emerged so far and has been marshaled here, a year after the DN, proves that it is this premature judgment that is reckless, not the policy measure.

ENDNOTES

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