Demonetization in India: Some Unsolved Economic Puzzles

Ajitava Raychaudhuri

The Demonetization in India has several distinguishing characteristics out of which two are noteworthy— the ‘surprise’ element attached to it for the general public and the rather theoretically indefensible aim of achieving too many targets with one instrument. The action can be put to the scanner to find the theoretical support behind it, but as can be surmised, it will produce several economic puzzles in the context of demonetization. This ranges from the reason for the surprise action to the stated goals of confiscating the black money, reducing prices and rate of interest as well moving towards a digital economy. Some of these may be contradictory to each other. The paper looks into the logical consistency of the objectives with respect to the instrument chosen and as a corollary, conjectures about its impact on growth.

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1. Introduction

The dramatic and sudden move by the government of India to demonetize high denomination notes of Rs 500 and Rs 1000 have evoked significant interest and debates among economists. The suddenness of the action from the midnight of 8th of November 2017 jolted everybody in the nation in one way or the other. By this action almost 86 per cent of currency in circulation was affected. Although the action was sudden, the high denomination notes were not declared non-legal tender immediately. Some time was given to deposit the notes in banks. Also,
demonetization was accompanied, albeit slowly, by a process of re-monetization whereby new design Rs 500 notes and completely new Rs 2000 notes were issued. In the ensuing debate, questions were raised about the wisdom of this action since the critics were vocal that it will lead to slower growth of GDP and significant job-losses, especially for the vast unorganized sector of the economy. However, the debate in some sense lost sight of the original intentions stated behind such a drastic action. Thus, instead of a careful dissection of the gap between intent and result of this measure, most commentators have discussed only the impact of this measure. As a result an uninitiated reader sometimes is drawn into the vortex of a cross-current of intellectual exchanges somewhat losing sight of the fact that success and legitimacy of a measure lies in understanding how far the stated objectives of an action is fulfilled.

The initial announcement of this measure by none other than the prime minister of the nation unambiguously stated three goals of such a measure- (i) Recovering the black money circulating in the economy (ii) Curbing the terrorist activities in the country which is largely financed by such black money and (iii) Confiscating the fake currency circulating in the economy. Further, the suddenness was clearly justified by the government in terms of flight of black money from the economy either abroad or in the real sector like land, real estate or gold if time is allowed in carrying out this measure. In the course of elaborations by government representatives (for example, Finance Minister’s interview in Times Now TV channel on November 10, 2016), some additional implied targets of this action came to the limelight, namely (iv) Lowering of headline inflation through reduced demand (possibly conspicuous) (v) Reducing lending rates for investors since banks will be flushed with deposits of defunct notes and (vi) Promoting a digital economy by making the availability of cash sparse. No clear statement was made about growth scenario of the economy neither there was any specific estimate of the possible job-loss in the economy.

No one can deny that to achieve too many targets with too few instruments is technically impossible. One really cannot solve too many unknowns with too few independent equations. This seems to have been seriously put to task by the stated objectives of demonetization, which happens to be the single instrument to achieve so many targets. It is now clear that most of the debate was centered around the growth and job-loss scenario and paid minimal attention to the original stated
objective of such a drastic measure. As a result, sometime short-run reallocation issues have been extended to long-run growth dynamics without a very clear bridge between the two. The present note aims to address these issues in some detail since some of these appear to be really economic puzzles whose answer is hard to come by. Neither those who framed these policies have come up with clear answers to such puzzles, nor the critics have paid too much attention to them since the debate veered more towards the impact instead of an analysis of the fulfillment of the stated goals of the action.

2. Puzzle 1: Does ‘surprise’ really matter?

The demonetization has a ‘surprise’ element embedded in it. The main reason for such sudden action is stated to be the fear that the black money will either fly abroad or will be transformed into real estate, land or gold. Thus if the announcement is not made sudden and more time is allowed for such demonetization measure, the whole objective of this action will be defeated. Let us discuss it more formally.

In terms of national income circulation diagrams, money circulation links the two sides of income generation and spending. At any moment of time money supply is expressed as a stock whose circulation facilitates the process of transforming income into expenditure. Thus one thing should be made clear- money circulation is neither income nor wealth. Thus confiscating a part of money circulation which supports illegal economic activities does not amount to dismantling of the black economy or capture of the black wealth which was accumulated over the years. Thus the term black money is rather confusing to a layman and it should be clear from an economist’s point of view that black income is a big multiple of black money in circulation and black wealth is still a bigger multiple of the same.

Anyway, why should the suddenness of the action matter so much? One argument was that the black money in circulation will simply vanish in the thin air if a staggered process is allowed. Economists like Kenneth Rogoff suggested a staggered process in his book The Curse of Cash (2016, Chapter 1). The Indian policy makers thought otherwise. To note that black economy runs parallel to the legal economy. Thus it is a parallel income circulation process to the legal circulation. Let us briefly formalize it as follows.
Legal National Income Circulation identity implies,

\[ Y = E = V \]  

where \( Y \) denotes aggregate income, \( E \) denotes aggregate expenditure and \( V \) denotes aggregate Value Added.

If black income is generated every year then \( Y > E \) but the identity is brought about by introducing errors and omissions. Suppose \( Y - E = B \). This amount then goes to the black economy’s circulation process.

Black Economy Income Circulation then must have Aggregate Income \( (Y_B) \) < Aggregate Expenditure \( (E_B) \) whereby \( E_B - Y_B = B \) (which is siphoned off the legal circulation process). Thus every year the black economy expands in size. In this circulation process, money acts as a facilitating device through its velocity. In order to facilitate the circulation, black money stock every year is added with fresh generation either by unaccounted cash transaction through legal tender or through fake currencies.

Now any circulation through velocity of money implies money changes hand from individual \( H_1 \) to individual \( H_m \). The money in circulation, either in the legal or black economy, unless destroyed, could never vanish, it can only change hands. It is clear that leakage occurs in the legal economy which inflated the black economy. Some reverse leakage from black to legal economy also happens but it is not large at all. After all, if the reverse leakage is large, the government has not much to worry!

Given the above, money in the black economy will change hand as a reaction to government demonetization announcement. It may either go to a gold merchant or a real estate dealer or go to the foreign exchange dealer via ‘hawala’ transaction or even to ‘terrorist’ outfits. But the money in circulation will remain in the black economy, it cannot dissipate in the thin air. So even if a staggered process were adopted so that people were given more time to deposit withdrawn notes and in the meantime, new notes replaced the old ones, nothing different would have happened. But the sudden jolt could have been easily avoided as the amount of black currency in circulation would have remained the same as its utility value would have gone to zero after demonetization was announced. The only thing is that the government may
have to take action against individual $H_m$ instead of individual $H_1$ who originally generated this black or unaccounted cash. It is more of a monitoring and enforcement issue rather than vanishing of black money in circulation. Thus the main reason for this unseemly hurry to announce demonetization sounds hollow.

The other possible reason for this may well be the so called rational expectations theory that a policy announcement can only produce its desired result if it is announced as a ‘surprise’ rather than a ‘rule’. There is a good literature about the monetary policy following rational expectations theory much of which has to deal with its impact on inflation. We will come back to this while discussing the intention of curbing price rise through this measure, but suffice it to say, this policy was aimed at the black economy and not the legal economy. As discussed above, such a sudden decision was uncalled for to achieve its main stated objective.

3. **Puzzle 2: Demonetization will reduce inflation**

One thing is clear that this action was supposed to reduce the money supply in the economy if the monetary authority does not compensate the withdrawal of cash by enough increase in the reserves in the commercial banks leading to presumably more credit creation. The credit creation, even if more reserves are available, is presumptive for the simple reason that supply of more bank credit must have a commensurate increase in demand. The monetary authority did one more thing- the Reserve Bank of India (RBI) increased the limit of Market Stabilization Scheme (MSS) bonds from Rs 300 billion to Rs 6 trillion so that the cash transferred in high denomination notes from private sector to banks could not go to excess reserves of the banks. Thus in terms of simple algebra (Harris, 1985, pp. 134-135):

$$M = H \left( \frac{1}{C + \frac{R}{M}} - \frac{C}{D} \cdot \frac{R}{M} \right)$$

where, $M =$ Money supply, $H =$ High Powered Money = Cash with private and the banking sector, $C =$ Cash with private sector, $D =$ deposit with the banking sector, $R =$ Cash reserves in the banking sector.
The demonetization measure in one shot aimed at reducing the value of C/M but keeping Cash Reserve Ratio (CRR) constant so that R/D ratio did not change. Clearly this action would have raised the money supply in the economy. But how could RBI plan a reduction in money supply? This was done through the increased MSS limit mentioned earlier by which commercial banks were forced to keep a major part of their newly acquired cash deposits locked in the MSS bonds. Thus effectively the reserves with the banks were taken away by the RBI, thereby reducing both H and R/D. Does it reduce the money supply in the short run? It requires more calculation as to how much cash came back to the banks and how much does H go down due to MSS bonds. RBI has still not published transparent figures on this.

For the sake of argument suppose money supply decreased as a short term measure. As Dasgupta (2016) argued, by the standard wealth effect argument in the short run this would lead to a decline in the aggregate demand. This is textbook argument following Keynesian logic. But it is not clear whether the policy planners behind demonetization were adherents of the Keynesian AD-AS arguments. On the contrary, if one takes the Quantity theory arguments, money demand essentially depends on the GDP such that $M_d = \text{Money demand} = \alpha(Y+Y_B)$. It is well known that in the extended quantity theory

$$\alpha = f(r,c_T,Y,Y_B)$$  \hspace{1cm} (3)

where, $r$ = real rate of interest (not distinguishing between lending and borrowing rate at present), $c_T$ = transaction costs and $Y,Y_B$ as mentioned earlier.

It is conjectured (and supported by media reporting) here that $c_T$ increased aftermath the demonetization measures as people had to stand in the long lines and had to run around for cash at ATM machines etc. As per Quantity Theory, this would have led to increased money demand at any instant of time. The moment $M_d$ showed a tendency to shoot up, the government introduced a rationing scheme so that any individual had to be content with a fraction of his demand for cash. Further, the rates of interest on deposits were reduced but no change was there for the lending rates initially.
These confusing policies led to a supposed fall in money supply and a rationed increase in money demand. So finally it could lead to both possibilities—an excess demand or excess supply of money. If there happens to be excess supply of money then there will be excess demand for goods, and this would have led to increased prices, even by the standard quantity theory logic. But there is more missing links in the argument. The whole logic assumed constancy in Y and YB or minimal change in that. But Indian economy is not as homogeneous as the developed economies. The large unorganized sector had huge cash dependency. So even if the supply of the inputs of this unorganised economy was not severely affected, the demand side was badly affected for the simple reason that cash was withdrawn from the public and there was rationing on money demand. Thus some of the sectors like jewellery, textiles, leather, retail trade and also real estates had to face an adverse demand shock. So the demonetization was undertaken with the assumption of minimal impact on the GDP (white and black) but no proper estimate was discussed beforehand due to the surprise nature of the policy change.

Any policy which is adopted as a ‘surprise’ is the backbone of rational expectations school. Knowingly or unknowingly, the policy of demonetization fits into this model remarkably well. If we follow a simple model like Sargent and Wallace (1974), this claim can be supported well. Let us give a brief description of this as follows. According to standard quantity theory, the following holds.

\[ P_t = M_t + \gamma_d^d \]  

(4)

That is, price change depends on change in money supply and some random demand/supply shock. On the other hand, money supply change is determined by,

\[ M_t = \gamma M_{t-1}(Rule) + \gamma_m^m \]  

(5)

Where the first term is the monetary growth rule, and the second term is the unpredictable shock like demonetization. Assuming that the random terms are white noise, and the expectations are rational, it is easy to show that,

\[ P_t - P_t^\pi = \gamma_m + \gamma_d \]  

(6)
where, the second term on the left hand side is the expected inflation.

If it is assumed that the demand/supply shocks are minimal and demonetization is a negative random shock, then the expected inflation is less than the actual. Thus, the policy planners may have assumed that the sudden monetary shock will lead to lower inflation.

But as mentioned above, the claim that there will occur no significant random shock for supply is subject to empirical verification. However, the prices showed no sign of rapid rise during the first few months of demonetization largely due to very good agricultural harvest and stable petro prices. The maintenance of lending rates apparently ensured stability of rupee exchange rates as the foreign capital inflow maintained its tempo for lack of better alternatives globally. All these ensured there is not a dramatic supply side shock and perhaps the policy planners behind demonetization had assumed likewise. In any case, the monetary policy aftermath the demonetization had enough confusing steps which were not very consistent with the controlling prices objective mentioned close to the demonetization announcement.

4. **Puzzle 3: Interest rate and digital economy**

The standard Keynesian approach will suggest that a demonetization will change the composition of money supply so that cash with the public will decline while reserves with the bank will rise. Thus high powered money will have a compositional change. But given that deposits in the commercial banks go up by a significant amount, if CRR is not changed, this should lead to higher money supply through more credit creation (see Puzzle 2 above). If that is so, in the standard IS – LM framework interest rate should fall, more so if IS curve also has a rightward shift due to positive wealth effect.

There are several twists to this simple story. One is the simple fact the dramatic increase in MSS bonds mopped up a significant amount of the excess reserves which accumulated with the banks. The other is the fact that agriculture sector even today did not depend much on formal credit, especially when formal credit does not help them in consumption smoothing. The services sector, especially retail trade and real estate had faced a cash crunch affecting their ability to go for more credit. The organized industrial sector (both manufacturing and mining) still has not picked up
the rapid growth which the policy planners are looking forward to. Thus, although supply of credit may have a sudden jump, the demand for the same showed no major sign of change. As a result, commercial banks parked their excess reserves with the RBI in the MSS bonds to avoid paying a huge interest on savings bank deposits (their willingness in fact prompted RBI’s action of raising the MSS upper limit as mentioned above). Clearly, money supply had no clear indication of a rise (especially when re-monetization also proceeded slowly as a policy). The cash with the public never returned to its original level and the banks did not increase their credit to deposit ratio in any significant manner.

Under the circumstance, the IS-LM curve might well show a completely opposite movement where theoretically both the curves shift to the left (IS shifts due to negative wealth effect and LM shifts due to lower money supply) and the lending rate may not change. Essentially, this happened to be the actual story. But this scenario can only be true if output is curtailed in the process. The recent data published by the government for the third quarter of 2016 shows no such tendency. If the above theoretical conjecture is valid, then this is only possible if there happens to be either a high error and omission between income and expenditure data or that the method of approximating unorganized sector output by formal sector industrial production index is a gross overestimate.

Now the digital economy slogan, if effective will lead to an increased velocity of money circulation. This will lead to a lower money demand and depending on the money supply might lead to either excess supply or equilibrium in the money market with a lower money supply. This will lead to higher price level through excess demand in the goods market but in the absence of concrete data, nothing definite can be said. But that the lowering of price level is achieved due to excellent agricultural crop and low petro prices cannot be denied. The point is if lending rate has not changed and velocity has not increased much, then the goal of demonetization is questionable.

5. **Puzzle 4: The growth impact**

Demonetization is expected to have some long term impact (longer than short term to be precise). Economists have projected the impact of this on growth which is predominantly adverse. Unfortunately the theoretical support of this is somewhat
drawn on the basis of the short term reallocation effects. The original goals of demonetization were rather mute on the growth impact. It is not very easy to understand the exact implication on growth of this demonetization drive for the simple reason that this is primarily a monetary policy issue and the inter-linkage between money and growth is perhaps the least understood topic in growth.

The growth models involving money supply discuss the neutrality of money supply on growth. One gets an excellent summary of this in Harris (1985, chapter 18). The models are all extensions of one sector neo-classical models (recent endogenous growth models have focused more or less on real variables). One set of models pioneered by Tobin (1955) introduced the outside money as wealth in the savings function. The natural implication is that if the real balance declines, more savings will be generated, which will push the per capita savings curve upward in the standard Solow diagram. This will increase investment leading to higher capital labour ratio and higher growth. The reverse happens if real balance increases.

If one follows this line of thought, it is clear that outside money with public (basically the cash component in money supply) is reduced aftermath the demonetization. But as argued above, the implication on prices is uncertain, since the effect on GDP in the short run as well as bank credit movement is left to guesses. Even if one allows changes in GDP, one is not sure what happens to prices, hence it is really difficult to predict the movement of real balance in the long run.

Another approach to understand money and growth is to introduce money as a factor of production as in, among others, Stein (1970) and Fischer (1974). Here again real balance may be both in terms of outside and/or inside money, but it appears directly in the production function. If it is inside money, no real balance effect appears in savings function, but otherwise it will appear in savings function also. Now a policy like demonetization may lead to lower outside money and/or inside money, but it will affect production function for sure but per capita savings may move either way depending on the money supply and prices. A curtailment of outside money will affect production downwards leading to lower growth. The main problem is how to justify introduction of money in the production function? As Fischer (1974) has argued, it is much more acceptable as a facilitator of production rather than as a direct input. This argument may well apply to the unorganized sector in India since it is highly cash dependent where real cash balance acts as a variable which ensures
smooth availability of inputs. In that case a fall in real balance will cause a decline in unorganized sector output directly. This kind of function was introduced by Dornbusch and Frenkel (1973), which may be modified here so that the cash balance affects production in the unorganized sector in the following way:

\[ Y_U = \left[ 1 - m \left( \frac{M}{P} \right) \right] F(k,1) \]

where \( F(k,1) \) is the standard production function under CRS but the real cash balance facilitates production such that \( m(\infty) = 0, m(0) = 1, m' < 0, m'' > 0 \).

But again confusion arises as to what is the effect of demonetization on prices since the overall price effect was never spelt out as a conjecture when the demonetization was announced. As a result the nexus between growth and demonetization is never discussed theoretically. The above gives some idea regarding the channels through which it might work in the long run.

6. Conclusion

This short piece has one main theme- that is to discuss logical consistency of the goals of demonetization. The root problem seems to be far more number of targets compared to just one grand instrument namely demonetization. As a consequence the stated objectives which are all short run in nature are bound to produce economic puzzles. In this context, it is important to note that discussing the effect of demonetization should be viewed against the stated objectives and their logical consistency. It is still unacceptable to discuss growth scenario in terms of short run variables. In any case, some of the criticisms may turn out to be coinciding with the puzzles discussed here, but the importance of analyzing the logical consistency and the underlying methodology of demonetization should not be minimized. Otherwise, demonetization debate may miss the forest for the trees.
References


