Notes (and anecdotes) on Demonetisation

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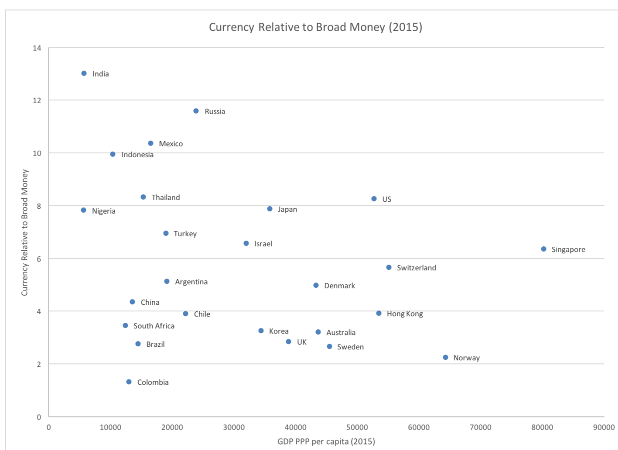
It would not be an overstatement that demonetisation announced by the Prime Minister of India on November 8th might have been one of the largest self-inflicted macroeconomic shocks on a country in the absence of a short term crisis. A lot has been written and speculated about since its introduction. In fact at this stage it is hard to present a viewpoint that has anything original to say and what follows are my collected thoughts on the policy. I also had the opportunity to visit India in the first week of December and thus had a chance to experience some of the disruption first hand. It allowed me to interact with family members, friends, and have extended discussions with taxi drivers, domestic help, grocery vendors, the streetside chai-seller, etc. Moreover, within a span of ten days I travelled between Mumbai in Maharasthra, Ajmer, Bhiwadi, and Pushkar in Rajasthan, Gurgaon in Haryana, and Lucknow in Uttar Pradesh. Given the magnitude of the "shock", I was expecting more chaos than what I saw. Perhaps, people were too busy trying to procure and manage their currency notes.

Given the sheer size - the decision to withdraw 85% of the cash in circulation has thrown India into disarray. Such a large and unexpected policy change naturally carries with it a large collateral damage at least in the short run. This is particularly true for India where a large section of the economy is comprised of the informal or unorganized sector (not registered with the government and hence not subject to taxation) which functions on cash but is not illegal. The informal sector in India is labor intensive. According to one estimate about 80% of employment in manufacturing and about 75-90% in the service sector in 2005 was in this sector.[1] At the same time, in terms of GDP, it is estimated to account only for about 20% - evidence that

[1] Ghani, Kerr and O'Connell (2013)

productivity in this sector is extremely low.[2] Nevertheless, the fact that it encompasses so much of the country's labor force, means that it bears the brunt of the cash drainage.

Another way to examine the extent of the effect is to look at currency use in India relative to other countries. The chart below displays the relationship between the share of currency in broad money vs GDP per capita for a limited set of countries. Data on currency in circulation is not easy to come by for many countries. I have used the information compiled by Rogoff (2016) while the GDP and Broad Money data are taken from the World Bank. While there is a weak negative relationship, India also looks like an outlier compared to other countries at similar per capita incomes. In other words, it is more reliant on cash as a form of money compared to other countries. Rogoff (2016, figure 3.5) also ranks countries based on the share of largest denomination notes as a fraction of circulating currency. Argentina and Japan are the highest with 88% followed closely by China at 87%. Though he does not include data for India, with 86% of the currency in circulation in largest denominations, it is also clearly at the top of the heap.



Most of the discussion (and in particular, much of the criticism) in op-eds and blogs has focussed on whether this was necessary at all, and the shortcomings in its implementation. In my view, the answer to the first requires one to wait. As far as implementation is concerned, it is hard to see how the subsequent shortage of cash could have been dealt with in advance. Any unusual orders of cash production would have immediately leaked out

[2] See LaPorta and Shleifer (2008)

and the entire exercise would have been DOA. The same would hold true for any gradual demonetisation. However, there is no doubt that since the announcement, the government and the Reserve Bank of India have been effectively "winging" it with seemingly erratic changes in rules about deposits and withdrawals. Such inconcistency does not help their cause. In my extended discussion below, I note some other shortcomings in terms of dealing with the shortage. There are some other criticisms such as the near term decline in economic growth particularly when the Indian economy was doing well. However, I would argue that it is best to do this when the economy is doing reasonably well. Conditional on the government being set on demonetising large currency notes, it makes more sense to implement it when the economy is growing, and has the ability to weather this than when the economy has other things going against it as well.

1 Some Toy Math

In this section, I briefly discuss first, the size of the black economy in India and second, some of the possible money supply implications of demonetisation.

1.1 Black of the Envelope Calculations

One of the main goals of the demonetisation move is to eradicate the black economy. But, how large is the black economy? Estimates are hard to come by, and also depends on whether one is talking about the shadow economy as in Schneider, Buehn, Montenegro (2010) which is restricted only to legal production of goods and services to avoid taxes and regulations. In India, black money not only refers to this but also bribes used to receive government services (that citizens are already entitled to), as well as the cash that is used to purchase votes during elections. To get a sense of the size of the black economy, I will undertake some calculations based on some heroic assumptions. Consider the equality,

$$\frac{BlackCurr.}{BlackGDP} \equiv \frac{BlackCurr.}{TotalCurr.} \times \frac{TotalCurr.}{MeasuredGDP} \times \frac{MeasuredGDP}{BlackGDP} \tag{1}$$

where Black GDP refers to the total value of all transactions taking place in the black economy. The above equality also helps us in clarifying the differences between black currency, black economy (GDP) and black wealth. According to the latest estimates, about 80% of demonetised notes have gone back to the banking system. In other words 20% reflects currency that is a loss to the owners. Let's assume therefore that $\frac{Black.Curr}{TotalCurr} = 0.20$. The true value is probably higher since a lot of the black currency has been laundered. Second, we know that the currency to GDP ratio in India stands at a little over 10%. We do not know the $\frac{BlackCurr.}{BlackGDP}$. Let's use the 10% ratio also for the latter (i.e. the left hand side of the above expression.). My hunch is that it is actually higher, since currency is more important in the black economy than in the overall economy. Using these values, we have the result that $\frac{MeasuredGDP}{BlackGDP} = 5$ i.e. the black economy is about 20% of the total economy. This is surprisingly close to Schneider et al.'s estimate. However, one might argue that the $\frac{BlackCurr.}{BlackGDP}$ is actually higher - in which case the size of the black economy would be lower. However, this is possibly offset by my underestimate of the ratio of black currency to total currency. However even though the black economy might be about 20% of measured GDP, black wealth would be higher since its accumulated over time. As a reference, according to the Penn World Tables, India's wealth to income ratio is a little above 3. Given that black wealth includes both cash holdings as well as gold and real estate, it is likely to be higher since the latter two have much lower rates of depreciation. In other words, black wealth compared to the economy's measured GDP might be anywhere between 75-100%.

1.2 The Quantity Equation with Large Informal and Black Economies

In this section I briefly revisit the quantity equation of money that we teach undergraduates to get a sense of the money supply implications. The standard version of this is,

$$M \times V = P \times Y \tag{2}$$

It is useful to remind ourselves that the right hand side of the above equation should be the total value of all final transactions in the economy. In the Indian context, this should include all informal market activity and also the black economy. Therefore, I divide the right hand side into three different sectors in the revised equation below. The effects of demonetisation will vary by sector. Finally, in the equation below I label velocity as the true velocity since it will be obvious it is currently mis-measured (as it is usually calculated as a residual),

$$
\begin{aligned}
M \times V_{true} = &\underbrace{(P_F \times Y_F)}_{formal} \\
&+ \underbrace{((P_F + P_B) \times Y_{FB})}_{formal,black} \\
&+ \underbrace{(P_{IF} \times Y_{IF})}_{informal}
\end{aligned} \tag{3}
$$

At the outset, we should recognize that every variable in this equation is endogenous and thus proceed with caution. The first expression on the right hand side captures transactions that take place in the formal sector with both cash and other forms of money. In the short run, this sector might suffer the least. The next expression refers to the formal sector where transactions also include illegal payments - e.g. property transactions and government services. If demonetisation works then in the longer run the effect would be to reduce P_B, the portion of the price that is paid in black money in this sector. Since $P_B > 0$, the current measured velocity must be lower than V_{true}. The third expression refers to the informal sector of the economy which is not illegal but is not correctly recorded in national accounts either. Usually the government relies on sample surveys to estimate the size of this sector to incorporate into GDP. Depending on the degree of the mismeasurement this also leads to an underestimate of the true velocity of money in the Indian economy. One of the claimed benefits of demonetisation is that it will also reduce the size of the informal sector (and increase the size of the formal sector). Therefore if corruption were to actually decline and P_B went down (and presumably $Y_F B$ increased) and also the mismeasurement of the informal sector went down, overall the measured right hand side would increase and so would the velocity. This is simply an accounting result.

More interesting short to medium term effects emanate from the left hand side.[3] First, note that the supply of money in the economy is the money multiplier times the monetary base (currency+reserves held by banks), i.e.

$$
M = \left[\frac{(1 + C)}{(C + ER + RR)}\right] \times \text{Monetary Base} \tag{4}
$$

[3]I am particularly grateful to Doug McMillin for his insights into these issues.

C refers to the currency deposit ratio, ER refers to the exccess reserve ratio and RR refers to the required reserve ratio. Demonetisation will have the direct effect of reducing currency in circulation, especially in the short run given the current restrictions on withdrawals (over and above the notes that become trash). In other words, the monetary base will decline. In the near term this will almost certainly lead to a decline in economic activity. At the same time, the currency deposit ratio also goes down and the government's expectation is that this will lead to an increase in the money multiplier. The money multiplier in India currently stands at 5.8 i.e. each Rupee that goes back into the banking system increases broad money supply by Rs. 5.80. However, for this to work, we must assume that the banks will not hold any excess reserves (relative to what they have been doing). Thus if prices are sticky enough, and the decline in the monetary base is more than offset by the increase in the money multiplier, it effectively amounts to an expansionary monetary policy. The degree of this depends on how pro-active banks are in making loans with the new deposits. If the RBI and the banking system can engage in this successfully, then it would lead to a medium term boost in economic growth.

Finally, a third effect would work through the Reserve Bank of India's balance sheets. If 20% of the old notes never make it back to the banks, then the Reserve Bank can write a check to the Indian Government which, as some have speculated, might be used as a fiscal stimulus to further grow the economy. Alternatively, the Reserve Bank might decide to further increase its liabilities and engage in another round of monetary expansion.

To summarize, one can expect an increase in both measured GDP, and an increase in money supply leading to a further increase in actual GDP. The latter could be reinforced further by either a fiscal or yet another monetary stimulus. Therefore, in theory the growth prospects of the Indian economy in the medium term should improve considerably. In reality, a lot depends on how crippling the short run effects are - mainly the apparent freezing of entire local markets due to a lack of liquidity. Second, for the money multiplier to increase, the banking system needs to make loans. Financial inclusion involves not just providing people with bank accounts but also easy access to credit. In fact, as LaPorta and Shleifer (2014) note, the most significant barrier for informal firms is not corruption but borrowing constraints. As is well known, a large fraction of lending in India, however, is passive - to government supported enterprises, or as part of it's various subsidized credit schemes.

2 Benefits of Demonetisation

Leaving equations aside, I now discuss some of the arguments in favor of demonetisation and my views. One can view these as removal of distortions and thus increases in TFP and resource allocation in the long run. I list below the three claimed benefits, and a fourth externality.

1. **Addressing the problem of corruption and the black economy.**

   One of the touted benefits of demonetisation is that it would drain the swamp, as it were. Since hoarders would either have to come clean and pay punitive taxes (and probably be subject to further investigation), or have to turn their cash to trash, the system would be purged of significant amounts of black money (currency). To what this extent this happens is a question that can only be answered once we have the data. By December 10th about 80% of the high denomination currency notes made it back to the banks. Hoarders have come up with ingenious methods of laundering their money. For example, I was told that a businessman in construction was overpaying his daily laborers in cash which he had already hoarded, and making them write refund checks.

   Critics of the black economy goal argue that only a small fraction of ill-gotten wealth is actually held in cash. It has been converted into property, gold, dollars, etc. I am not convinced by this criticism. While money in its various forms is the medium of exchange for an economy, cash is *the* medium of exchange for the black economy. If critics argue that the sudden shortage of money will freeze the economy temporarily and cause a decline in GDP, the same is more true for the black economy. Further, the value of real wealth that has been acquired using black money also drops, since, in the absence of cash, its resale value drops as well. Not surprisingly, pundits predict a steep drop in the market for property, gold, and luxury goods. This effectively also leads to a redistribution of wealth.

   All of this is conditional on what happens when remonetisation sets it. For this “draining” and one time permanent wealth loss to work, the new high denomination currency notes that come into circulation must be severely limited in supply, and ideally, traceable. Further, India has always had a shortage of small denomination notes, and this might be an opportune time for the government to correct the persistent misallocation in the distribution of notes.

A second reason it might lead to erosion of black money is that it is likely to make a larger dent on the wealth of the smaller offenders - the government babus (officers) who must be paid for every small piece of paperwork to be approved. While every country has its share of corrupt politicians, real estate mafia, etc., it is this "petty" corruption which is an epidemic in Indian society. My own conjecture is that this group of individuals might have a harder time laundering their cash holdings.

A third reason for demonetisation is the pernicious practice of political parties "buying votes" with cash handouts during elections, particularly in rural India. This is probably the area where demonetisation might have its largest effect in the short term since this requires hoarding of cash. However, if this is where the policy has its greatest success, then it come across as blatantly self-serving and undermines Modi's credibility for future reforms.

2. **To reduce the extent of counterfeit money.**

   When I went into the bank last week to deposit some of my high denomination notes, one of them turned out to be counterfeit. More seriously, this has been an ongoing problem and is often tied to "terror" or insurgency funding. At least in the short term demonetisation should put a brake on this. The critics of demonetisation argue that only an insignificant fraction of currency is actually counterfeit. This is certainly true - according to a study by the Indian Statistical Institute in 2016, the amount in circulation is about 0.02% of the total value of currency. However, this misses the point. The question is the extent to which this counterfeit currency disrupts daily lives of ordinary citizens and requires the Indian government to spend on defense and anti-terror activities. If it turns out that the new currency is easy to forge, then at best this causes a temporary disruption and does not solve the problem. Irrespective of the outcome, this is a useful but supplementary reason for undertaking such aggressive demonetisation.

3. **The move to electronic currency**

   To me this is the least important, and is at best a tool to make the transition easier. The government and its supporters have touted the benefits of mobile money and the use of ATM's. While India today, even in the rural areas, is not the same as it was twenty years ago, and bank account holdings as well as access to credit via Kisan (Farmer) Credit Card schemes etc. has made huge inroads, the fact of the matter is that a large section of the population remains without access to a mobile phone capable of these transactions, or access to a bank account with a debit card. Just as building schools and toilets does not mean that their use will increase, neither will ATM's or mobile money. A wholesale shift requires a behavioral change and users need to be convinced of their gains. In fact, on my last day in Mumbai, my brother informed me that his local grocer had discontinued the use of mobile money. The cash situation had considerably improved, and the grocer did not want to deal with the "complications" of using mobile money. I can relate to this. Upon my arrival in India, I was advised to open a mobile money account (PayTM being the most popular one) due to the shortage of cash. While, it certainly helped me pay for taxis, using an app to interact with a seller standing in front of you involves a few extra steps compared to cash or swiping a card. Debit cards, while simpler, also require merchants to have point of sale machines. In the absence of a proper communication and electronic infrastructure this is not a useful solution. A school friend who is now a bank manager indicated that there was currently a shortage of 40,000 of these units and the two businesses that provide these were in no position to meet that kind of a shortfall.

Finally, Gordon (2016) notes that credit was ubiquitous in the US in the early 20th century. Even street peddlers had access to credit from the wholesale dealers. He also notes that the ATM machine was introduced circa 1969. In other words, ATM machines diffused only after the great wave of growth was over.

4. **An externality: Improved information about the cash economy**

   In including this, I have partly been influenced by Piketty's book which I subjected my undergraduates to this semester. As Piketty notes, one of the problems facing tax policy is that the information on wealth of the richest is sparse. The same is truer for the Indian economy where very little is known about hidden wealth. If the government's forensic experts are any good, then the pattern of deposits should provide it with information about those who might have potentially laundered their black money and information on the various channels and modes through which black money operates. This assumes that the government has the expertise, human resources, and conviction to follow up.

3 Conclusion

As with most economic reforms, there are costs that are immediate, obvious, and asymmetrical while the gains are diffuse and often hard to measure. In the case of demonetisation, Modi has staked his position as a leader capable of making bold decisions. The unprecedented boldness of the decision itself seems, at least in urban and semi-urban India, to have played in his favor. In my own interactions with individuals from various walks of life and income levels, there is clearly a willingness to suffer through the inconveniences so that corruption can brought under control. However, this support is not unconditional and depends on the speed with which the current liquidity crunch is resolved, and also how well the battle is played out in the media (tales of suffering citizens vs the stream of news about tax raids and cash seizures). And while Modi may own the narrative now, much of the success depends on the next steps that his government introduces to tackle black money. In other words, demonetisation would be the first step.

In economics, when evaluating the costs and benefits of a new policy, we ask if those that are harmed can be compensated adequately. In this respect it is clear that the Modi government has come up short and one wonders why he did not put in place an action plan to help those who were likely to be the most inconvenienced. The ones who are most likely to suffer are also the ones who are most vulnerable to vote buying. If things go downhill, his political foes may have no need to buy votes.

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collection of academic contributions on this matter. In particular, Amartya Lahiri's essay touches on similar issues.

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