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What ails GDP growth in India – Demonetization or High Interest Rates?

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Abstract

GDP growth in India has slowed down to less than 7 %, from the recent high level of 8.2 % in 2015-16. It is widely believed that the demonetization experiment, announced by Prime Minister Modi on November 8, 2016, is responsible for the slowdown in investment and GDP growth. This paper provides statistical tests to estimate the determinants of GDP decline – somewhat surprisingly, it is not demonetization, but the ultra-hawkish interest rate policy followed by the RBI, that seems to be responsible for the growth slowdown.

1. Introduction

It is a pleasure to write this paper for the festschrift for Shubhashis. I recruited him to his job at the Policy Group, the first private think tank in India. It contained many stars, and Shubhashis was a star among stars! And I am pleased that he has successfully pursued the dream of a private think tank.

I had a choice on what issue to write about. It could be on poverty, a subject both he and I have spent extensive hours on. Or I could write on what I thought Shubhashis would like me to talk about. I chose to talk about the latter – the issue of demonetization – what happened, and how much loss to GDP growth was there due to this seemingly costly intervention in the Indian economy. One additional reason for choosing this topic is because it involves a subject dear to my heart, and the heart of Shubhashis and my good friend, and student colleague at Princeton – Clas Wihlborg. At Princeton, Rakesh Mohan and I often described Clas as interest rate Clas (and Nixon Clas as opposed to Brezhnev-Mohan-Balla!).

So here goes – examining the economic impact of demonetization on GDP growth, via the effect of interest rates on growth.

2. Demonetization and Black Cash

Currency with the public forms part of the transactions demand for money. While the demand for money question has been researched extensively by monetary economists, the demand for currency question has received only limited attention. The reason is obvious – typically, currency forms about 45 % of the sum of cash and demand deposits (M1) in emerging markets i.e. not variable enough, compared to demand deposits. [All cross-country data from IMF/World Bank – emerging markets are the same as what was termed a developing economy before i.e. countries outside of the advanced economies and countries belonging to the former Soviet Union].¹

The question to be answered is: how much of the cash holdings in India are (were) excessive? It is widely believed that excess cash holdings are just a vehicle for corruption payments. If there is a large element of cash holdings in India, relative to that which is deemed “necessary”, then perhaps demonetization was a necessary step. Hence, the first question we address is the estimation of excess cash holdings in India, or the estimation of “black cash”.

2.1 Some pointers towards black cash (BC)

In 1971, cash was 12 % of consumption, in fiscal year 2016/17 (just before demonetization) it was 18 % of consumption, and among the highest in the world. Between 1971 and 2001, the share of cash in consumption increased at the rate of 0.7 % per year; over the next 14 years (2001 to 2015), this share increased at double the previous 30 year rate: 1.4 % per annum.

In fiscal year 2014/15 (sometimes fiscal years are noted by just the first year e.g. 2014/15 is actually 2014), cash in India was 62 % of M1, a number that places it among the top 25 % of emerging markets (EMs). In 2000, the EM cash average was 36 %, and India 45 %. This is our first crude estimate for the need for demonetization – too much cash floating in the economy, and excess cash as high as 17 % of M1 i.e. 17 % of the entire narrow money supply in India was possibly unnecessary for “efficient” transactions.

Using IMF and World Bank data on the cash component of M1 and its share in private consumption for 87 countries, the following results are obtained:

- The median share of currency in consumption is 10.3 %. In India, the share, at 20.3 % is almost twice the median, and roughly at the 85th percentile.
- Modelling the relationship between currency and consumption i.e. currency as a function of consumption, one obtains a ranking of the residuals for the different developing economies (with population above 2 million). This residual can be termed as “excess” cash in the system. For 2015, India ranks as the 6th highest “cash-rich” economy.
- The excess cash, as percent of consumption, in India was observed to be 9.2% of *consumption* expenditures; somewhat ahead of Nepal (7.8 %) and somewhat behind Thailand (10.3%), and interestingly much higher than in neighboring Pakistan, 2.7 %. In both Bangladesh and Sri Lanka, the estimated residual suggests that cash holdings in both economies was lower than what was “deemed” necessary for consumption.

If the reasonable assumption is made that the consumption behavior (both cash and non-cash) in India should not be much different than the neighboring countries of South Asia, or the average emerging economy, then we arrive at the following simple conclusion: black cash was a big problem in India, and needed to be addressed.

3 Demonetization – What happened?

The Indian government chose to address the black cash problem via demonetization. Starting November 9 all Rs. 500 and Rs. 1000 rupee notes were taken out of circulation i.e. they were no longer legal tender. The “attack” on these two notes was there because they alone constituted about 80 percent of the entire cash in circulation (about Rs. 16 trillion).

How unusual was the demonetization policy? Not that unusual for India; de-monetization was attempted in 1978 when only Rs. 1000 notes were demonetized. However, these notes constituted less than 1.5 % of all the cash in circulation in 1978.

If about 80 % of cash in a cash dependent society is eliminated overnight, then obviously one should expect a large downfall in economic activity. That is what Econ 101, the demand for (cash) money teaches us. No sooner had demonetization happened, that various “experts”, and politicians, jumped the gun in order to be the first to predict doom and gloom for the Indian economy. What actually has transpired (until March 2017, or six months after demonetization) is the subject addressed next. We attempt to measure the impact via GDP data for 2016/17, the first year post demonetization.

3.1 Growth Slowdown and Demonetization

The attempt to measure the growth impact of demonetization is confounded by several “problems”. First of all we need to recognize that half of the fiscal year was over at the time demonetization was announced (fiscal year in India runs from April to March). The cash withdrawal took place on November 8th, and on November 18th, the government called a pro-active meeting with “experts” on agriculture. This was in the guise of pre-Budget discussions that the Ministry of Finance has every year in January, but was preponed to mid-November. Why? Because the heavily cash dependent rural economy was expected to be hit badly by demonetization.

Indeed, a majority of the experts felt that the winter *rabi* crop might as well be given up for “dead”. After two successive years of drought, 2014/15 and 2015/16, an event that has happened only five times since 1871, and only thrice since Independence, agriculture was due for a bounce. But India had been made to prepare for the worst via de-monetization – i.e. the unthinkable third consecutive “drought”, something never before experienced by Indian agriculture. What actually happened – agriculture grew by 4.7 % in 2016/17, and this helped propel GDP growth to 7.1 %.

The widespread expectation was that *annual* GDP growth would decline by at least 2 percentage points (ppt) from the 8.2 % level observed in 2016/17; actual fall was only 1.1 ppt. . Given that half the fiscal year was already over by the time of demonetization (actually, more than half, seven months), we need to delve into quarterly GDP data for 2016/17 to isolate what happened to GDP, and when. GDP growth averaged 7.7 % for the first half of 2016/17 – even a 2 percentage point (PPT) decline in annual growth meant that GDP growth in the second demonetization half would average 3.5 %. Actual GDP growth for the last two quarters in the fiscal year averaged 5.4 %, or significantly above the pessimistic forecasts. Does that mean that demonetization (sometimes referred to as DM in this paper) did not have a negative effect on the economy? No, it does not mean that at all. *The effect of DM on growth can only be examined by comparing actual growth versus expected growth.* How do we measure expected GDP growth for 2016/17?

Not easy or straightforward, precisely because there are several confounding effects that have to be accounted for. These confounding effects need to be isolated, before reaching any credible judgment on the effects of DM on GDP growth. As noted above, agriculture should have been affected by demonetization, but was surprisingly not. My own estimate of agricultural growth prior to demonetization, based on weather alone, was that agriculture would grow at 7 %. This estimate is obtained from an agricultural growth model based on rainfall, and lagged rainfall (see Bhalla, 2010). Thus,

even though agricultural growth grew at 4.9 % in 2016/17, it should have grown at a minimum of 6 %, possibly 7 %. This means that overall GDP growth in 2016/17 was lower by 15 to 30 basis points (agriculture is 15 % of GDP) in 2016-17 and lower because of demonetization.

Besides agriculture, there are other confounding effects. Take, for example, the contribution to GDP growth of government spending (the category Public Administration and Defense, hereafter PAD). PAD GDP grew at 8.1 and 6.9 % in 2014 and 2015, respectively, for an average pre-DM growth of 7.5 %. Accelerated (real) PAD spending in 2016 allowed this sector to grow at 11.3 %. This sector has a 14 % share in GDP so the extra growth of 3.9 % contributed an extra 0.55 % to GDP growth for 2016. Thus, the two confounding sectors, agriculture and PAD, led to around a -.75 % impact of demonetization in 2016-17 i.e. GDP growth in 2016-17 “should” have been 7.8 % rather than the observed 7.1 %. Given that this was the widespread expectation of GDP growth in India pre-demonetization, we can conclude that India performed normally despite demonetization i.e. DM had a near zero effect on economic activity outside of agriculture and government influenced PAD.

4 Non-PAD non-agricultural growth

Industry was the other sector expected to suffer from demonetization. Industry (excluding construction) has two components – small and medium scale industry accounting for about 5 % of GDP, and a sector very likely affected by demonetization. Some journalistic accounts had a decline in this sector of close to 50 % in the immediate aftermath of DM.

Taking the two industrial sectors together (mining and manufacturing, hereafter MM), we see that the MM sector was already in the throes of a decline prior to demonetization. Quarterly data indicates that MM growth peaked in the last quarter of 2015. In 2015Q4, MM growth was a high 13.0 %. The next three quarters this sector’s y-o-y growth registered 12.3 %, 8.9 % and 6.6 %. Thus, in the quarter just before demonetization, MM growth was a low 6.6 %, almost half the pace of that registered three quarters earlier. This decline obviously cannot be attributed to demonetization. The next two DM quarters, MM growth was 7.2 and 5.4 %, or an average rate of around 6.3 %.

As a first cut, DM did have an effect on MM growth, but we have to be cautious about drawing firm conclusions because a trend decline appeared to have set in prior to demonetization. The MM sector, however, is not an appropriate sector for examining the effects of demonetization, because of the familiar non-DM related problems plaguing this sector: the presence of large non-performing assets on the books of the banks.

To reiterate, the normal procedure to estimate the effect of any shock would be to look at how aggregate GDP growth has declined from what was expected. We cannot undertake the normal procedure because industrial growth (manufacturing and mining) was already in decline because of the NPAs. An alternate procedure, and the one pursued below, is to estimate the decline in GDP growth directly affected by de-monetization and not suffering from inherited problems e.g. services, excluding PAD, plus construction, a sector which normally forms part of industry.

So what is an analyst, like Shubhashis, to do? I propose that the best way to examine the demonetization effect is to examine the performance of the non-agricultural, non-manufacturing, non-mining and non-public expenditures sector. If these four sectors are omitted, we are left with about 56 % of GDP, or what we term the DEM sector, the sector “exogenously” vulnerable to demonetization. The

first two years of the Modi regime, 2014-15 and 2015-16, the DEM sector averaged GDP growth of 9.3 %, and in 2016-17, a much lower 6.9 %.

This gives us the first estimate of decline in GDP growth due to DM: a 2.4 % decline for 56 % of GDP (or a 1.3 % decline for aggregate GDP growth). Not as large as some analysts expected, but significantly larger than what the overall GDP growth indicates. The question remains – how much of the DEM GDP growth decline of 2.4 % in 2016-17 could have been caused by factors *other* than demonetization e.g. high interest rates?

In almost every country in the world, interest rates are expected to affect GDP growth. The reason almost is mentioned is that in India the conventional wisdom is that interest rates do **not** matter. I have documented this in detail in an earlier paper (Bhalla 2010). Whether interest rates affect growth is a matter of empirical record, not ideological thought. In the spirit of the earlier article, we offer the following simple test: is DEM growth affected by variations in the real lending rate of banks to the DEM sector?

The real interest rate is measured as the lending rate of the largest bank in India, State Bank of India. This is the longest such series in India, going back to 1971. The real rate is defined as the nominal rate minus inflation as measured by the CPI (or CPI for industrial workers prior to 2011). It is introduced into the analysis with a lag of one year i.e. real lending rate affects growth one year later.

The chart below documents the simple relationship between DEM GDP growth, and (lagged) real interest rates for the 38 year period 1978 to 2016; the earlier years 1971-1977 are omitted from the analysis because of the confounding effect of oil price increases.

For a variable that is not supposed to matter, that is a pretty strong fit – and one spanning nearly 40 years. A simple regression between DEM growth and lagged interest rates reveals that the latter has a coefficient of -0.49 with a t-statistic of 4.15. The R^2 for the one variable regression is 0.26. This relationship is extremely robust and impervious to insertion of any dummies for any of the years. The chart also reveals that the relationship is very strong.

Commented [CW1]: Clas was right at Princeton after all!

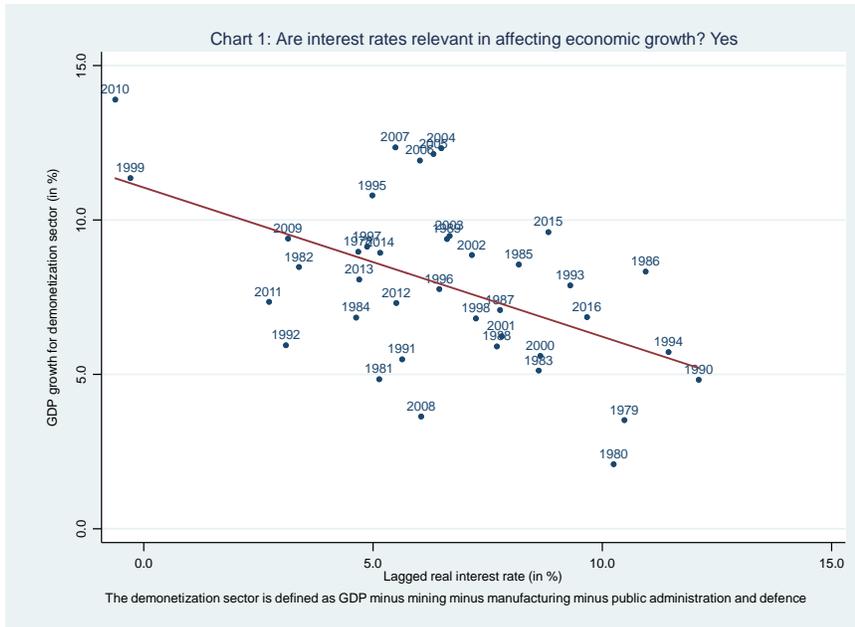


Figure 1. The relationship between real interest rate and GDP growth for the demonetization sector.

Source: CSO for GDP growth, CEIC for lending rates

Regardless of whether overall GDP growth is observed, or growth for the DEM sector, there is a significant decline for the fiscal year 2016-17 (referred to as 2016 in the chart and the table). Assume that the average for 2014 and 2015 represent the trend before demonetization. Actual growth for these two years: GDP, 7.7 %, DEM, 9.4 %.

Since we are not concerned with GDP growth but with DEM growth, the discussion will only be on the latter. Predicted DEM growth (predicted on the basis of the pattern of real lending rates) for 2014 and 2015: 8.4 and 6.8 % respectively, or an average of 7.6 %. For 2016, predicted DEM growth is 6.4 %.

Hence, trend DEM growth *predicted to decline by 1.2 % without knowledge of impact of demonetization*. If this decline is accepted for the entire economy, then GDP growth in 2016 is expected to be growth rate in 2015 minus 1.2 % or (8.2 – 1.2) or 7 %. GDP growth in 2016-17: 7.1 %!

This regression now allows us to estimate what the growth in the DEM sector would have been in the *absence* of demonetization. Table 1 documents the pattern of growth since 2011. What is relevant for us is the pattern since 2014, the first year of the Modi administration.

Table 1: Do interest rates matter for growth?

year	Growth in (%)			Level (%)
	GDP	MM	DEM	R
2011	6.3	1.9	7.3	2.7
2012	5.5	4.9	7.3	5.5
2013	6.5	4.8	8.1	4.7
2014	7.2	8	8.9	5.2
2015	8.2	10.8	9.6	8.8
2016	7.1	7	6.9	9.7

Notes: R is the real interest rate (SBI lending rate deflated by CPI) lagged one year

MM refers to mining and manufacturing; DEM refers to GDP – MM – Agriculture – Public Administration and Defence

5 Conclusions

This leads us to the following surprising conclusion. Demonetization affected growth in agriculture, but this decline was made up by increased government spending. Aggregate GDP growth did decline in 2016-17 by 1.1 ppt, from 8.2 to 7.1 %, but this decline is entirely attributable to a steep rise in real lending rates. Each 1 % increase in the lending rate leads to a lower GDP growth rate of -0.5 %. Lagged real lending rates averaged 5 %, 2012 to 2014. In 2015 and 2016, lagged real rates increased by about 400 basis points, and this increase was primarily responsible for the decline in GDP growth. Bottom line- don't blame demonetization for declining GDP growth, blame RBI (and now RBI plus MPC) for decelerating GDP growth.

References

Bhalla, Surjit S, 2010, "Indian Economic Growth, 1950-2008: Facts & Beliefs, Puzzles and Policies", in Acharya, Shankar and Rakesh Mohan, ed., *India's Economy: Performance and Challenges, Essays in Honor of Montek Ahluwalia*, Oxford University Press, New Delhi, 2010.

¹ Statistical results are author's calculations based on these official data, as well as data published by the Central Statistical Organization (CSO), India,