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Is Demonetisation a Windfall for the banking sector? Evidence from the Indian stock market

Ritika Jain

Centre for Development Studies, Trivandrum

Abstract

Demonetisation by the Indian government on the evening of November 8 has quivered the entire economy. However, one sector that has been expected unanimously to benefit from this intervention is the banking sector. In the last decade, the two segments of the banking sector- private and public sector banks have witnessed contrasting trends in the management of non-performing assets resulting in recapitalization of public sector banks by the government. Against this back drop, the current study examines the impact of demonetisation on the returns of 40 (private and public) listed banks in India. The study uses aggregated and disaggregated data to measure the impact of demonetisation employing an event study approach and regression methodology. The findings suggest that the overall banking sector had recorded modest rise in returns after demonetisation but the effect was short lived. By segmenting the sector into public and private segments reflect differential impacts. The public sector banks witnessed an immediate positive effect on the returns whereas the private banks recorded a lagged negative impact.

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Demonetisation by the Indian government on the evening of November 8 has quivered the entire economy. However, one sector that has been expected unanimously to benefit from this intervention is the banking sector. In the last decade, the two segments of the banking sector- private and public sector banks have witnessed contrasting trends in the management of non-performing assets resulting in recapitalization of public sector banks by the government. Against this back drop, the current study examines the impact of demonetisation on the returns of 40 (private and public) listed banks in India. The study uses aggregated and disaggregated data to measure the impact of demonetisation employing an event study approach and regression methodology. The findings suggest that the overall banking sector had recorded modest rise in returns after demonetisation but the effect was short lived. By segmenting the sector into public and private segments reflect differential impacts. The public sector banks witnessed an immediate positive effect on the returns whereas the private banks recorded a lagged negative impact.

1. Introduction

In an emerging economy, banking sector is the propeller for financial inclusion, credit availability, capital formation and thereby economic development. Since it is closely intertwined to many sectors, performance of the banking sector has important ramifications for other sectors too. One of the main measures to examine overall banking sector performance is to focus on Non Performing Assets (NPAs).[1] According to the latest Financial Stability Report (RBI, 2016), released by the Reserve Bank of India (RBI) in June 2016, the Indian banking sector's gross NPA rate rose at an alarming rate of 7.60 %, highest since 2004. However, this rise in gross NPA rate was driven by public sector banks (PSBs) specifically (Figure 1). While the rise in total gross NPAs for the PSBs and private banks were comparable (95% and 102% respectively) from 2005 to 2010, it shot up by 385% and 94% from 2010 to 2015 for PSBs and private banks respectively.[2] The trend reversal in gross NPA as a fraction of gross cash advances for the two segments is evident in Figure 1.
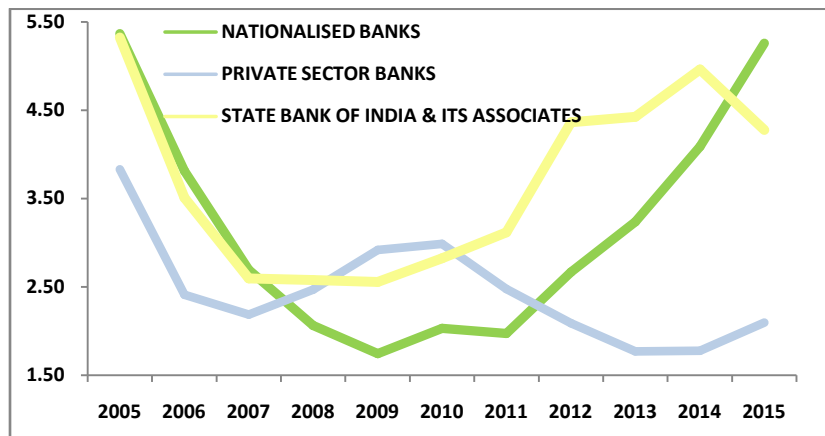
Figure 1: Gross NPA over gross advances for different bank segments[3]

Since 2008, rising NPAs in PSBs is a continued combined effect of absence/minimal asset quality review, political intervention, short tenures of bank chiefs and frequent lending to projects incapable of revival (RBI, 2016). In 2008, the banks with high gross NPA rates were mostly private (7 out of 10), with ICICI Bank topping the list. A similar analysis for 2015 depicts that 9 out of 10 banks with high gross NPA rates are public (Firstpost, 2016). The stress in PSBs resulted in these banks writing off huge loans in the last few years (Indian Express, 2016). The government then had to infuse more money into the PSBs for recapitalization. In August 2015,

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[1] According to RBI requirements, an NPA is defined as a loan or advance where: (i) interest and/ or installment of principal remain overdue for a period of more than 90 days in respect of a term loan,
(ii) the account remains 'out of order' for a period of more than 90 days, in respect of an Overdraft/Cash Credit (OD/CC), (iii) the bill remains overdue for a period of more than 90 days in the case of bills purchased and discounted, (iv) interest and/or installment of principal remains overdue for two harvest seasons but for a period not exceeding two half years in the case of an advance granted for agricultural purposes, and (v) any amount to be received remains overdue for a period of more than 90 days in respect of other accounts.
Source: https://www.rbi.org.in/scripts/BS_ViewMasCirculardetails.aspx?Id=449&Mode=0

[2] Calculated from the dataset

[3] Source: Data collected from RBI website. Link: https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications#!4

the current Bharatiya Janata Party (BJP) government committed to a capital infusion of Rs. 70,000 crore (of which Rs. 23,000 crore has been released) in PSBs over a four year period (Indian Express, 2016; Business Standard, 2016). These reports reflect the cushioned support that PSBs enjoy from the government in times of financial stress. Although recapitalization has been a continued policy support tackling NPA problem in PSBs demands additional measures.

Amidst this, the Prime Minister of India, Mr. Narendra Modi made an announcement to demonetise the Rs. 500 and Rs. 1000 currency notes on the evening (8 PM) of November 8, 2016. The Prime Minister listed three main reasons for the policy move- (i) to tackle black money in the economy, (ii) to eliminate fake currency and dodgy funds which have been used by terror groups to fund terrorism in India and (iii) to reduce cash transactions and shift to a cashless economy (Economic Times, 2016). Since then analysts and academicians have attempted to examine different dimensions of the policy intervention. The efficacy of demonetisation in attaining these objectives have been questioned and supported by certain sections. Doing away from the above ambiguity, the current study examines the effect of demonetisation on the banking sector in India.

The study limits attention to the banking sector because of the following reasons. First of all, financial sector is the backbone of an economy (Levine, 1997 and Wachtel, 2001). Thus, any distress in the banking sector has important ramifications for the performance of other sectors. In fact, linkages of banking with other sectors are strong enough for stress from other sectors to trickle down and reflect in the banking sector. Secondly, banking sector has a pivotal role in implementation of a policy intervention like demonetisation. Frequency of loading ATM machines with new notes, exchanging old notes and depositing funds decide how rapidly the economy bounces back to normalcy. Thirdly, the immediate consequence of demonetisation – massive deposits, high liquidity and falling interest rates have important balance sheet implications for banks. These factors highlight the critical role of the banking sector in the context of demonetisation in India. The poor performance of banking in the last few years, make the context even more interesting. Whether demonetization gives a positive shock to the banking sector or not is a question that only time will unravel. However, the current study aims to examine the short term effect of demonetization on the price movements of banking sector in the stock market.

The study attempts to explore the behavior of stock prices of Indian banks listed on the National Stock Exchange surrounding the date of demonetisation. Using event study analysis and regressions, the price movements of listed private and public sector banks is tracked. It is seen that demonetisation has a positive impact on returns of banks. Further, the effect is short term since the effect is strongest in the first few days after demonetisation. Disaggregating the banking sector into private and public segments reveals a differential impact. While the public sector banks have recorded higher returns after demonetisation, the private ones witnessed a decline in returns.

The rest of the paper has been divided into four sections. The next section discusses the overall aggregated impact of demonetisation on major sectors with emphasis on the banking sector. Section III discusses the event study and regression methodology. Section IV presents the results. Finally, Section V concludes.

2. Aggregate Impact

On November 16, after a week into demonetisation, the daily closing price of NSE S&P CNX Nifty 50 index dropped by 5.1% as compared to November 8. This plunge made it the worst weekly close value since February this year (Bloomberg, 2016). To examine it further, the price movement of major sectoral indices at NSE is examined: automobile, consumption, realty and banking sectors. The means of the closing value of the indices is compared for a period of 25 trading days before the event (3rd Oct- 8th Nov) with a period of 11 trading days after the event (9th Nov- 24th Nov). From Table I, it is evident that the worst hit sectors by demonetisation are automobile, consumer and the realty sector. The banking sector on the other hand has a differential impact.

Sectors	Pre-returns (%)	Post- returns (%)	Difference (%)
Nifty Auto	-0.08	-1.2	-1.12**
Nifty FMCG	0.03	-0.82	-0.90***
Nifty India Consumption	-0.1	-0.93	-0.83**
Nifty Realty	-0.2	-1.01	-0.81**
Nifty Private Bank	0.01	-0.73	-0.74**
Nifty Bank	-0.01	-0.5	-0.49*
Nifty Metal	0.2	-0.14	-0.34
Nifty PSE Bank	**-0.1**	**0.14**	**0.24****

*Note: The data has been collected from NSE India website. *, ** and *** denote statistical significance at 10% , 5% and 1% respectively.*

Table I: Difference in mean returns before and after demonetisation

The automobile sector has recorded the highest plunge in mean returns following demonetisation. A reduction in cash transactions has restrained demand for two wheelers and has a short run adverse impact on the industry (Business Line, 2016). Secondly, luxury car segments have been a safe haven for spending unaccounted money. With demonetisation and massive withdrawal of money in circulation, the sector is likely to have a significant impact, with the resultant impact being seen in the index. Further, Nifty India Consumption Index witnessed a decline of 0.86% after demonetisation. A subset of the Nifty India Consumption Index, FMCG (Fast moving consumer goods) has reduced by almost 1% post demonetisation. The sudden drop in money supply and increased incidence of deposits has led to demand reduction. With consumers purchasing necessities and postponing/canceling premium FMCG purchases and with producers curbing production to avoid stock pile up, demonetisation has hampered the sector (Sengupta, 2016). The mean return of realty sector post demonetisation is 0.81% lower than pre demonetisation period. A dominant route for storing black money and a multilayered tax system (Stamp duty and registration charges, VAT and Service Tax) has led to the sale price of properties being underreported in documents. The short term reduced volumes in resale market

and reduced demand has put downward pressure on land price (Indian Express, 2016). These points emphasize the negative effect of demonetisation on the returns of most sectoral indices.

2.1 Banking

Despite the wide ambiguity on the effects of demonetisation in the economy, one opinion that is unanimous in the country is its positive influence on the banking sector. With a rise in deposits both for current and savings accounts and falling interest rates, demonetisation is expected to spur liquidity and treasury gains. However, Table I indicates that the average post demonetisation returns for the banking sector is 0.49% less than the return before demonetisation. Does this imply that the banking sector has in fact been hurt due to demonetisation? This requires segregating the sector into the public and private segments. Public banking sector recorded a higher average return of the order of 0.24% post demonetisation. The private banking sector, in contrast, witnessed negative impact, a drop of 0.74% due to demonetisation. Hence, although public sector banks have reflected positive returns post demonetisation, the effect is not strong enough to offset the negative impact on the private banking sector. The aggregate impact of demonetisation on the banking sector reveals a contrasting picture for the two segments. After the first step of comparing means before and after disinvestment, the study uses econometric methods to examine the impact of demonetisation more accurately.

3. Banking- segmented analysis

The study tracks price movements of all public and private sector banks that are listed on the stock market. Closing stock prices are converted into daily returns and used for further analysis. Similarly, closing value of the NSE Nifty 50 Index is also converted into returns on a daily basis. The data spans from July 27, 2016 to November 22, 2016. There are 25 PSBs and 15 private banks listed on NSE. The market capitalization of the 15 private banks is more than double of that of the PSBs.[4] The closing value of PSB and private bank- sectoral NIFTY indices have been plotted in Figure 2 for a period of 8 months (Feb, 2016- October, 2016) before demonetisation. PSBs have experienced a flat trend line where as the private banks have experienced a positive trend. The next section discusses the econometric methodology used to examine the impact.

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[4]Calculated from the data collected from Prowess, as of December 2016.
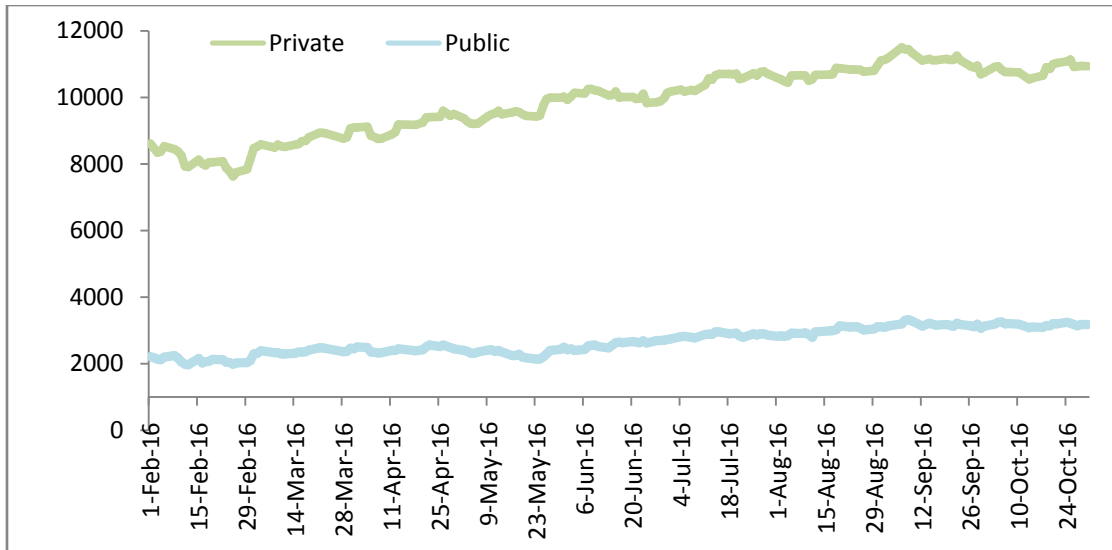
Figure 2: Closing value of NIFTY PSU Bank Index and NIFTY- Private Bank Index

3.1 Event study analysis

The period was divided into the estimation and the event period. The estimation period comprised of 60 trading days. Four different event windows are tested revolving around the announcement of demonetisation in the evening of 8th November: (a) five day window (Pre event: 2nd-8th Nov and post event: 9th – 14th Nov), (b) seven day window (Pre event: 31st Oct- 8th Nov and post event: 9th- 16th Nov), (c) nine day window (Pre event: 27th Oct-8th Nov and post event:9th - 18th Nov) and (d) eleven day window (Pre event: 25th Oct-8th Nov and post event: 9th-22nd Nov).

Event study methodology analyses the cumulative average abnormal returns (CAAR) of PSBs and private banks during the days surrounding the announcement. After removing the systemic component (NIFTY 50 returns) from the bank returns for the estimation window, betas for each bank is estimated. This is used to calculate the abnormal returns of each bank on a daily basis in the event window. The abnormal returns reflect the unusual returns specific to that bank.[5] The average abnormal returns for all PSBs and private banks on a daily basis provide the daily average abnormal return (AAR) for PSBs and private banks. The cumulative sum of abnormal return for days before and after the event is the CAAR before and after event respectively. If the CAAR before and after event is found to be significantly different then the event has had an impact on that sector.

3.2 Regression methodology

As a robustness test, the study employs a regression methodology using stock returns for all public and private sector listed banks only for the event period. Daily return of banks is the dependent variable. Using the market model, the NIFTY 50 return is used as an explanatory variable. To capture the effect of the policy intervention, the study uses a dummy variable that

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[5] The study assumes that the effect of Donald Trump's victory in the US elections, a couple of hours after the demonetisation announcement affects all stocks homogenously. Thus, by including the NIFTY 50 index, the US election effect has been controlled for.

takes the value 1 in the post intervention period. A dummy variable "Public" is also included that takes the value 1 if the bank is a PSB. This captures the differential impact of demonetisation on the PSB and private segments. Finally, to capture the conditional effect of demonetisation on the segments, the study uses an interaction of the two dummy variables.

4. Results

Table II presents the average cumulative returns of all private and PSBs before and after demonetisation. Four event windows are considered- (a) 3 days (b) 5 days (c) 7 days and (d) 9 days before and after demonetisation. Since the prime minister's address was made on the eve of November 8, it does not coincide with a trading day (but between two trading days).

Window span	Pre Event	Post Event	Difference
Three days	-0.012	0.08	0.092
Five days	-0.021	0.09	0.111*
Seven days	-0.02	0.06	0.08**
Nine days	-0.02	0.03	0.05**

Note: . *, ** and *** denote statistical significance at 10% , 5% and 1% respectively.

Table II: Cumulative average abnormal returns of public and private banks

Table II indicates that although there has been a rise in the cumulative average abnormal returns for private and public banks in the days following the announcement, it is statistically significant only if the event window is atleast five days. Further, the rise in cumulative average returns post demonetisation, reduces as the size of the event window increases. This suggests that it may be a short term effect. The cumulative average returns have been depicted in Figure 2.
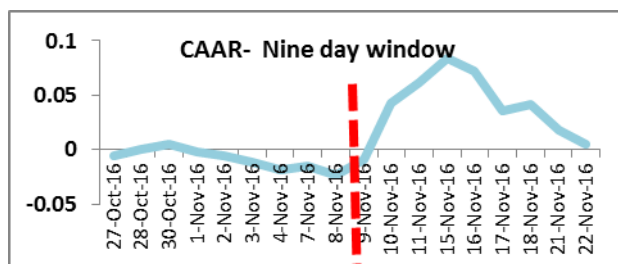
Figure 2: Cumulative average returns of private and public banks before and after demonetisation

Figure 2 corroborates with the findings of Table II. Five and seven day windows indicate high cumulative abnormal returns. However, with a nine day window, the cumulative abnormal returns at the end of the period almost coincide with the trend followed by the days preceding demonetisation. This suggests that the effect of demonetisation on the returns of banks was short lived. As a next step, we segregate the sector into the private and public segments and repeat the analysis.

PSBs			Private Banks		
Pre	Post Event	Difference	Pre	Post Event	Difference

	Event			Event		
Three days	-0.01	0.11		-0.002	0.02	
Five days	-0.03	0.15	0.18**	-0.003	-0.003	0
Seven days	-0.03	0.16	0.19*	-0.003	-0.1	-0.097
Nine days	-0.03	0.13	0.16*	-0.003	-0.13	-0.127*

Note: *, ** and *** denote statistical significance at 10% , 5% and 1% respectively. PSB stands for public sector banks.

Table III: Segment wise cumulative average abnormal returns of banks

The cumulative average abnormal returns of PSBs and private banks have been presented in Table III. It is evident that the aggregated result of the banking sector is not uniform across the two segments. The positive trend of the cumulative average abnormal returns is mainly driven by the public segment. PSBs have recorded positive significant returns in the days following demonetisation. The positive returns are persistent with window size. On the other hand, private banks experienced falling cumulative average returns in the days following the announcement. The negative impact has increased with a rise in window size. The cumulative average abnormal returns for the two segments are depicted in Figure 3.
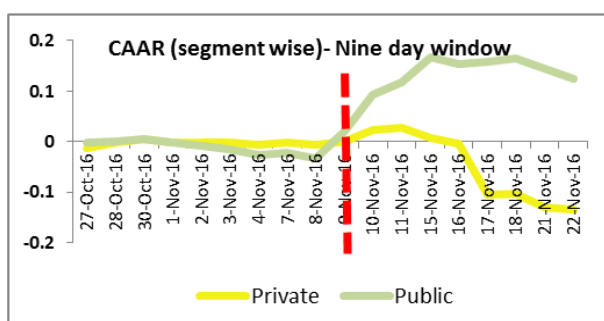
Figure 3: Cumulative average annual returns for banks

Figure 3 reiterates the fact that while the PSBs witnessed a surge in returns immediately after the announcement, the private sector banks observed falling returns only after five days of the announcement. Rise in PSB returns could be attributed to the fact that public banks have a major share (approximately 80% as of March 2016, see here) in Jan DhanYojna accounts. With the old five hundred and thousand rupee notes becoming invalid, these accounts and hence the public sector banks may witness a huge inflow of deposits. The private banking sector, in contrast, witnessed negative impact after November 15. One possible reason may be that due to the intertwined structure of various sectors with banking, the perilous impact of demonetisation on sectors as real estate, automobiles and consumption (see Figure 1) has percolated to the banking (private) sector. However, the public sector banks, cushioned by soft budget constraints and financial backing by the government during adverse times, are protected from this spillover effect.

Another reason for the opposite effect across the two banking segments may be due to the base effect for public banks since the profitability of public banks is one fourth of the private banks (see here).[6] With the ongoing problem of NPAs in PSBs, demonetisation can be viewed as a

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[6] In Figure 3, the CAAR curve for PSBs always lies below the CAAR curve for private banks before demonetisation.

positive intervention that may help PSBs "catch-up" with their private counterparts. This is because with the benefits of demonetisation, PSBs are expected to depend less on the government for recapitalization in the immediate future.

To summarize, the effects of demonetisation on the banking sector requires segmenting it into the public and private sectors. While the PSBs witnessed an immediate persistent positive effect in the days following demonetisation the private sector banks showed a different pattern. The negative effect of demonetisation on the private sector bank returns reflected only after five days of the announcement. The lagged effect may be due to the time taken for the existing pessimism in other sectors to bleed into the banking (private) sector.

4.1 Regression results

Table IV reports the estimates for the fixed effects regression models specified in the previous section. The dependent variable is daily returns of the closing prices of all private and public sector listed banks. The study uses two event windows: seven and nine days before and after announcement. Based on the market model, the main explanatory variable is the NIFTY- 50 returns. To capture the effect of demonetisation, a dummy variable "Time" is used that takes the value 1 for days after demonetisation. Also, to capture the differential impact, "Public" dummy is used with unit values for PSBs. Models I, and III use these variables and an interaction term between the two dummies- "Time" and "Public" to capture the conditional impact of demonetisation on the returns of PSBs as compared to the private sector banks. Models II and IV include firm size and liquidity measured as the logarithmic transformation of market capitalization and traded volume respectively to control for size and liquidity effects.

	Nine days		Seven days	
	Model I	**Model II**	**Model III**	**Model IV**
Nifty Returns	1.748***	1.622***	1.619***	1.518***
	(0.260)	(0.258)	(0.308)	(0.308)
Public Dummy	-0.003	-0.001	-0.005	-0.005
	(0.006)	(0.006)	(0.008)	(0.008)
Time Dummy	-0.010	-0.010	-0.014	-0.007
	(0.008)	(0.008)	(0.010)	(0.011)
Public* Time	**0.031***	**0.031***	**0.043***	**0.033****
	(0.010)	**(0.010)**	**(0.012)**	**(0.013)**
Firm Size		0.001		0.270***
		(0.001)		(0.079)
Liquidity		0.001		0.001
		(0.001)		(0.004)
No. of observations	720	720	560	560
R squared	0.07	0.08	0.07	0.07

> **Note:** The table presents results of a fixed effects regression of demonetisation on returns of banks. Models I and II present estimates for a nine day window. Models III and IV present estimates for a seven day window. Models II and IV control for firm size and liquidity. The main variable of interest is the interaction term. Standard errors are reported within parentheses. *,** and *** indicate significance at 10%, 5% and 1% respectively.

Table IV: Regression estimates for the effect of demonetisation on returns of banks

The coefficient of the interaction between "public" and "time" is positive and significant for all models. This implies that demonetisation has a higher positive impact on the returns of public banks as compared to the private banks. This validates the findings of the event study analysis.

5. Conclusion

The study uses adjusting closing price returns of private and public sector banks before and after demonetisation to conduct an event study analysis for different short- term event windows. Despite the unanimous belief of a positive impact on the banking sector, demonetisation has led to higher returns only to a segment of it- public sector banks. PSBs have witnessed immediate higher returns in the days following demonetisation. On the other hand, private banks recorded no immediate rise and then decline in the post demonetisation period.

The extended reach of PSBs in the rural areas provides an advantage to these banks as compared to their private counterparts. The PSBs have thrice the number of branches in the country as compared to the private banks (Business Standard, 2016). With seventy percent of Jan Dhan Yojna accounts, the PSBs have witnessed high deposits imposing a downward pressure on the cost of funds and less reliance on government for recapitalization in the immediate future. This favorable impact is reflected in the price movements of all PSB stocks. Only time will testify if the rise in PSB returns is a temporary phenomenon or a long term solution. While not getting into the debate of long-term cost-benefit of demonetization on different sectors of economy, the PSBs should grasp this opportunity with both hands in tacking the real problem of rising NPAs. However, a long term solution to tackle the persistent problem of rising NPAs is better management of funds in PSBs.

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