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Regional Disparity in Monetary Policy Transmission across Indian States

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ABSTRACT

The monetary policy is a lever to regulate financial economy but its transmission impact relies on the channels through which it transmits into the system. This paper reports regional variation while exercising a policy lever in context of Indian region, such that every region responded asymmetrically to the same stimuli, which depicts that within common geographical boundaries policy impact is different in each state, this is not due to different economic sectors but because of nature of financial dependence. This study also contradicts previous studies and asserts that policy percolation depends on the nature of financing rather on the composition of different sectors. To analyze policy impact I have employed three main variables as a proxy for economic indicators like Gross State Domestic Product, Gross Fixed Capital Formation, GDP Deflator and Repo Rate. To study the SDGP composition supportive variable is employed. With the help of Vector Auto-Regressive Model and impulse response function main variables response are reported and by Error Variance Decomposition Model states GDP composition with six sectors comprising (construction, Agriculture, Banking, Industry, Services and Manufacturing) response is reported by repo rate stimuli. This study opens debate for interstate policy rates difference hence do not provide any substantial evidence to support it.

JEL Classification: E52, E58, E43, E27

Keywords: Monetary Policy, Policy Shock, Regional Disparity, Financing Dependence, Transmission Response

Introduction

The monetary policy is designed to stabilise the general price level and simultaneously engender economic growth. In context of India, RBI regulates policy rate by examining the macroeconomic dynamics. To operate policy measures, monetary policy transmissions mechanism is exercised which examine and control the aggregate supply of loans along with a supply of deposit, and hence, they are the basic channels which tinker with the aggregate output along with macro health.(Valerie Ramey, 1993) reported sufficient evidences through which monetary policy impact macro economy by various channels. Transmission is the pipeline which executes policy measures through various credit channels or interest rates see (P. Glenn Hubbard, 1995). This study examines whether regional financial composition weaken policy stimuli as reported by (Gert Peersman, 2004) (Arnold, 2001). In particular, it examines whether India endures the regional disparities in policy executions among its regions. The literature like (Gerald carlino, Robert Defina , 1999) (Gerald carlino,Robert Defina , 1998)explain how US monetary policy impact in six regions and concluded that states which have small numbers of firms and manufacturing firms are the most sensitive to monetary stimuli. Increase in policy rate increases employment level for those states which are more dependent on imported raw materials due to strengthening of home currency (George Georgopoulos , 2009) like in Canada and Sweden (Emma Runnemark, 2013).

In case of India (DM Nachane, Parth Ray, Saibal Ghosh , 2002) found an asymmetric response to those regions which are dominated by manufacturing, hence change in state's domestic product occurs with change in policy rate where I see strong contradiction, because policy rate changes will only impact state economy if the financial depending incline towards banking finance. If not then by change in rate, intensity of impact will decline which I have reported in impulse graphs of states like Maharashtra where firms may depend on external financing rather banking finances, which reduces the policy impact as compare to other states. Contributions of such studies are motivation to investigate the asymmetric impact of policy shocks in Indian sub-regions with different channels of transmissions.

To study the asymmetric responses of policy shocks the study is ramified in two subsets of variables "main variables" where I employed State Gross Domestic Product at Factor Cost on constant prices 'as a proxy for economic growth', GDP Deflator 'proxy for price level', Gross Fixed Capital Formation proxy for level of investment and Central Bank Repo Rates proxy for key rates since 1993–2017 among and the "supportive variables" which comprise those factor which constitute the SGDP. With the retrospective records, Basic Vector Autoregressive Growth Model BVAGR is computed to envisage how unanticipated policy shock affects the Indian sub-regions. The categorisation of the state is done based on RBI 2015 report "Income Value" of Indian states. To understand the impact of policy shock I develop Shock Index with help of impulse response function, so that region-wise policy shock are depicted in impulse graphs, by employing the Variance Decomposition to supportive variables I clarify which variables will be most affected while any mutation in the policy rates. This study contribution is only to depict the spread in monetary policy across the Indian States rather to advice how to improve policy shock in the system.

The rest of the paper is organised as follows: Section 1 comprises of introduction and review of literature, Section 2 consists of model building among with the various tests which are required for the VAR modelling, Section 3 comprises of result and discussion along with the graph associated with results. Section 4 has the conclusion and future scope in this search, Section 5 comprise of References, and Annexure 1 and 2 contain all the supportive evidence based on which result are discussed.

Literature Review

Evidence from Europe, America and Asia Regional Disparity in Monetary Policy Transmissions. The rich literature narrates how Euro Zone affected by the regional disparities of monetary policy starting with (Gert Peersman, 2004) illustrated that common monetary policy shock in Euro zone effects the level of output in almost similar fashion among euro countries with high (Germany) and low (Netherland) degree of responses which depend on regional financial composition like banking finances or other sources of financing (Gerald A. Carlino and Robert H. DeFina, 1999) mentioned asymmetric responses due to increasing share of small bank finances. The degree of responsiveness may not be similar (Michael Ehrmann, 2000) studied thirteen regions of euro where Germany and United Kingdom are outliers of policy responses based on output, interest rate, similarly (Volker Clausen & Bernd Hayo, 2006) reported asymmetries in policy transmissions in Germany and Italy as to France on output gap and inflation , (Guglielmo Maria Caporale, Alaa M. Soliman, 2009) reported no response in output, prices level and private investment in Austria, Denmark and France with output decline in Germany, Italy (by short term interest rate) and decline in output in Germany, Netherlands by unanticipated policy shocks(by long term interest rate), (Ivo J.M. Arnold, 2001) investigated that short run interest rate disparity within the region is more as compare to between the countries (Germany, Italy, France, UK) which might indicate towards regional finances which weakens the policy transmissions.

In case of Netherlands (Ivo J. M. Arnold Evert B. Vrugt, 2002) reported oil and gas extraction sector reacted positively with unanticipated hike in policy rate whereas workers (private sector employees) loses wage level, (Vanessa Zammit*, 2010) reported asymmetries in housing market based on mortgage market rates. Whereas (Erik Britton and John Whitley, 1997) finds how countries changing regimes (among Germany, France, Italy, United Kingdom reacted more frequently to price change) issuance of monetary policy shocks differently.

(Masagus M. Ridhwana,b Henri L.F. de Groota,c Piet Rietvelda Peter Nijkampa, 2011) investigate in case of Indonesia where the 'Bali' region least affected by policy rate due to their inclination towards external borrowings see (Frederic S. Mishkin , 1996) explains how external financing weakens the policy impact while adopting contractionary regime (rising rates) increase the price of assets and therefore create more capital formation. Different regional composition may not result in asymmetric policy response is reported in case of 'Brazil' by employing VAR model and comprising regional factors together through principal component analysis see (rbe, 2014).

The Model

Let y_t be the vector representing equation one.

$$y_t = sdgp_{t-i},\ gfcf_{t-i},\ cpi_{t-i},\ rr_{t-i},\ bank_{t-i},\ const_{t-i,}indus_{t-i},\ ser_{t-i},\ agri_{t-i},\ manu_{t-i} \ldots (1)$$

$$t = time\ ,\qquad i = lags$$

$$Ay_t = g_o + g_1 y_{t-1} + e_t \ldots\ldots\ldots (2)$$

$$g_0 = (n \times 1) Vector\ of\ constant$$

$$g_1 = (n \times n) matrix\ fo\ co - efficient$$

$$e_t = (n \times 1) Vector\ of\ white\ noise\ inovation$$

$$e[e_t] = 0$$

$$E\ (e_1 e_t) = \{\Omega, if\ t = \mathrm{T}\}$$

$$0\ otherwise$$

$$\begin{matrix} \sigma_{e_1}^2 & \sigma_{e_1} e_2 \\ \sigma_{e_1} e_2 & \sigma_{e_2}^2 \end{matrix} = \Omega \quad \ldots\ldots\ldots\ldots (3)$$

$$E[e_t e_T^{'}] = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} = \text{for t} \neq \text{T} \ldots\ldots\ldots\ldots (4)$$

I employed Unrestricted Vector Auto-Regressive Model VAR, developed by (Sims) to study the relationship among the variables, the left-hand side represents$y$ as variables vector in the equation (1) at time t_{-1}, A represent the vector of correlation among the variables in the right side equation (1), g_o is the constant vector , g_1 is the coefficients vector and e_t represents the vector of error term where covariance among the error term (see equation (3) represented by Ω is zero see in equation (4). The equation (2) represent the reduce form of VAR equation is employed to study different variables in each set. This analysis is based on growth model by computing its 'first difference log values' and then employed in VAR model and record impulse responses. I chose VAR modelling for two reasons: first VAR model assumes endogeneity among the variables and secondly, because it depicts dynamic change based on retrospective data. I also employ Forecast Error Variance Decomposition "FEVD" model this explains say how much variation in the variable can be explain by the exogenous shock to other variable hence due to many sets of variables I have reported change caused by repo rate only. [1]

Data

The data is extracted from Reserve Bank of India (RBI) Handbook and Ministry of Statistics Programme Implementation (MOSPI) from the period of 1993 to 2017. The data consist of two set of groups Main and Supportive Variables. The Repo Rate is proxy for policy rates levers, SGDP (proxy for the level of economic activity or growth), GDP, D (proxy for the inflation or price stability) and GFCF (proxy for the rate of investment) among main variables. Supportive variable involves those variables which constitute the SGDP. The motive for employing these variable is mainly for two reason first to study the state financial composition and second to gauge the responsiveness of state economy cause by which sector more. The cause for employing GDP, D is because lack of CPI data hence time series required substantial amount of observations. Figures at last contains results of impulse response function of all the states I have use Indian heat map as a pedagogical device showcase region wise disparities in monetary policy transmissions by Figure MPT 1. Table V 1 contains Variance Decomposition results which depict the responsiveness of SGDP factors.

· **Unit Root, Lag selection, Co-integration and Granger Causality Test's**

To conduct VAR model estimates stationarity is pertinent measure. Augmented Dicky Fuller Test (ADF) is not reported, the variables values are converted in first difference log form at trend albeit rich literature suggests the reasonable relationship exist between these variable but to crosscheck, table A reports the co-integration among the variables by accepting the null Hypothesis 'H0' of 2 and 3 co-integrations. To check the causality approach among (RR and SGDP, GDP.D, GFCF) variables, Ganger Causality Test is reported in table B the null H0 is rejected, which depicts that repo rate cause the SGDP, GDP.D and GFCF. The pre-estimation lag selection criteria (by AIC and HQIC) three year lag selected to study the impact of policy shock in all the variable, hence it can be interpreted as whether within three years policy shock are to penetrate, auto correlation test are report in 'Table E'.

Table. A :

Ho: 0, co Integration (constant) , Ho: Accepted, 5 (lag)

	Goa		Karnataka		Rajasthan		J/K	
Rank Values	Trace Value	5% Critical Level	Trace Value	5% Critical Level	Trace Value	5% Critical Level	Trace Value	5% Critical Level
0	31.66	29.68	34.07	29.68	35.07	29.68	37.51	29.68
1	8.18	15.41	10.21	15.41	7.61	15.41	14.63	15.41
2	0.89	3.76	0.57	3.76	1.27	3.76	1.54	3.76

Note: Randomly three states co Integration results are reported form each section of state categorization.

Granger Causality Test.

Table. B

Ho: Repo Rate Granger Does not cause SGDP, GFCF

Variables	Lag Order	P. Value
SGDP	3	0.002
GFCF	3	0.002
GDP.D	3	0.003

Table. E

Auto Co-relation LM Test

Lower Income Group			Higher Income Group		
Lag	Prob.Value	States	Lag	Prob.Value	States
5	0.36	Rajasthan	5	0.69	Goa
5	0.45	Jharkhand	5	0.26	Maharashtra
5	0.99	Odisha	5	0.34	Haryana
5	0.84	Madhya Pradesh	5	0.93	Gujrat
5	0.38	Chhattisgarh	5	0.61	Tamil Nadu
5	0.86	Bihar	Special Groups		
5	0.74	UP			
Middle Income Group			5	0.94	Sikkim
Lag	Prob Value	States	5	0.38	Uttarakhand
5	0.16	Kerala	5	0.69	Himachal Pradesh
			5	0.13	Nagaland
5	0.63	Punjab	5	0.14	Tripura
			5	0.23	Meghalaya
5	0.10	Karnataka	5	0.96	Arunachal Pradesh
5	0.43	Andhra Pradesh	5	0.02	Jammu Kashmir
			5	0.60	Manipur
5	0.43	West Bengal	5	0.92	Assam

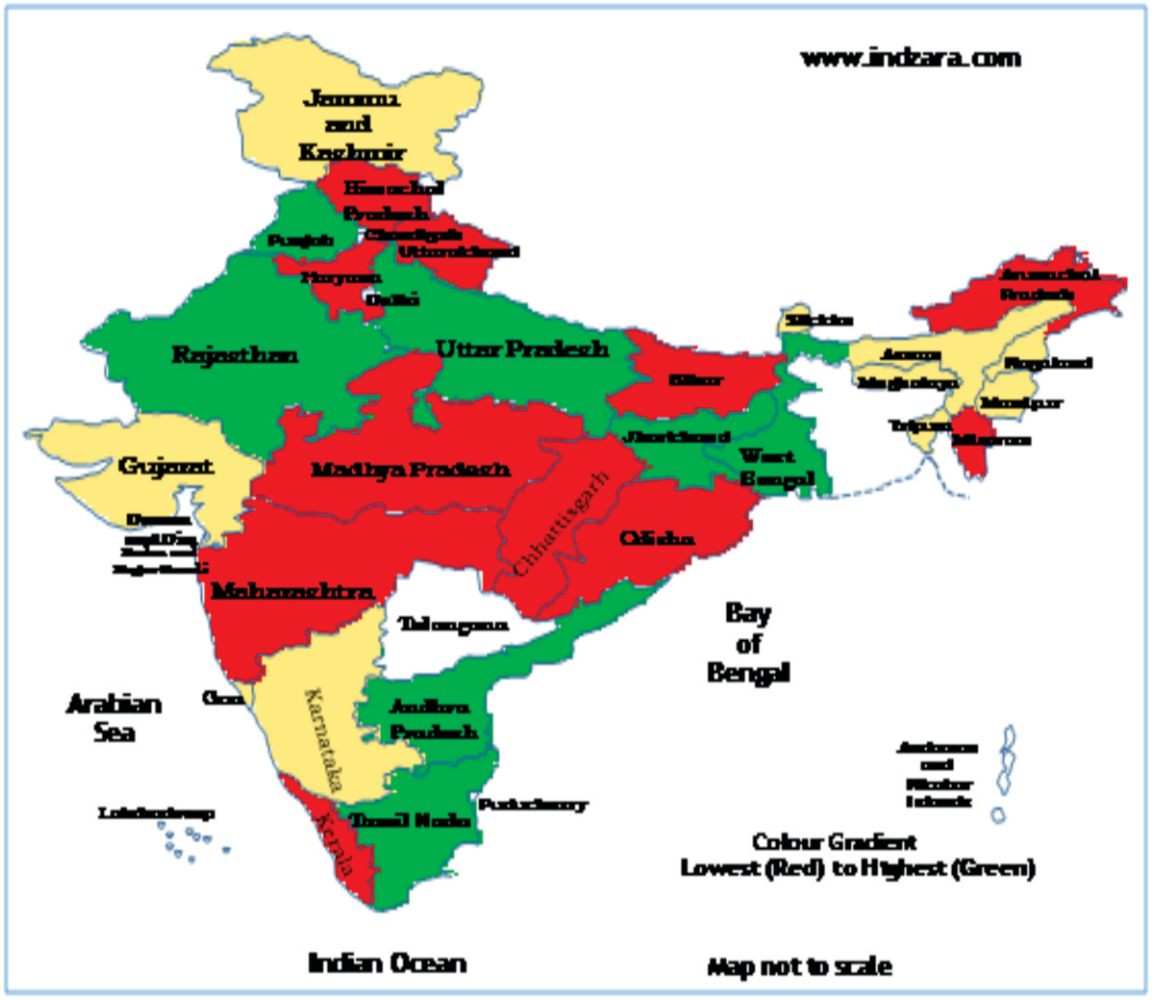
Result and Discussion

In this analysis, VAR model is employed to record the repo rate "one-degree standard deviation± shock" policy shocks response to its responsive variables, the dark black line depicts the variable response pattern whereas the dotted line represents the error band with two degree significance. Hence, the black line's movement with error band in same direction above or below significance line at 0 is relevant and significant (line dropping below with error band indicating the reduction in the amount). Repo rate is impulse variable and SGDP, GDP.D, GFCF are the responsive variables respectively. Assuming ceteris paribus, such as no war, no national emergency and constant economic growth, the one-degree policy shock to on these variables are reported. To detect the shock impact, I developed the Shock Index 'SI' which ramifies the shocks in three subset High Impact, Low Impact and No Impact 'also depicted in heat map in Annexure 2'. The High Impact occur if state respond in two variables among three, Low if response to one variable and No respond if no change among variables.

The HIS reacted asymmetrically to policy shocks as expected. Tamil Nadu reacted severely to the policy shock followed by the Gujarat and Goa whereas Maharashtra and Haryana have not responded to the policy shock, because industry in Maharashtra and Haryana are inclined towards external finances rather the banking finances which may dilute the policy impact.

The MIS shows asymmetries in policy transmission Punjab, West Bengal and Andhra Pradesh highly impact to policy shock within the error band followed by the Karnataka with low impact whereas Kerala have no impact to policy shocks. In LIS Rajasthan, Jharkhand, Uttar Pradesh are highly responsive to policy shocks whereas Madhya Pradesh, Chhattisgarh and Odisha have shown no impact to policy rate change. Among the Special states category Sikkim and Tripura are highly responsive to shock, Jammu/Kashmir, Nagaland, Manipur, Meghalaya have low impact to policy shock whereas Uttarakhand, Himachal Pradesh, Arunachal Pradesh have no impact to policy shock."The Annexure 2 compiles figures related to policy shocks reaction of all the states respectively" The responsiveness of states towards the policy stimuli depend on the financial composition of that state, the time lag of transmission, transmission channels, bank MCLR rates, state laws and the other factors may alter the results. Since I have not materialized the channels of transmission flows in these states, some states may respond more rigorously if change in these variables. The notion is to analyses the transmission impact region wise because all the states do not respond similarly to stimuli and, hence to develop better stimuli impact to consider state financial structure.

Figure. MTP 1



Note: I have use above figure as a pedagogical device to explain the policy shocks, region wise except the Indian Union territories and young states like 'Telangana'. The dark red color indicates No Transmission Impact, Green color High Impact and Light yellow color Low Transmission Impact among the Indian states.

· **Error Variance Decomposition**

As aforementioned, the supportive variables involve six compositions of SGDP. To report the sector responsiveness EVD model is employed to garner 0 to 10 year's response time. With EVD result I tried to materialize the factors behind the response 'only for those who responded to policy shocks'; this will clarify which state will be more severely impacted if the there is any mutation by the central stimuli. This will also clarify the region wise transmission impact hitting the state economy. The advantage for this analysis will concretize stimuli impact for a instance if Punjab is more responsive towards services and agriculture these two will be initial change first if targeted by policy levers hence can be increase and decrease state performance.

Among the HIS Tamil Nadu is highly responsive to policy shocks. Its responsiveness for the banking and agriculture sector are shown in table VI, whereas Gujarat is more sensitive towards construction and banking industry, and Goa for agriculture and construction.

Variance Decomposition share in State Domestic Product Table V1

Higher Income States	*Period*	*SE*	*BNI*	*CONS*	*INDS*	*MANF*	*SERV*	*AGRI*
	1	0.2726	0.00	0.000	0.00	0.00	0.00	0.00
	5	0.5237	0.2005	1.2465	0.5823	0.5231	0.3861	2.7747
GOA	10	0.9661	0.1493	1.2762	0.5875	0.5083	0.3105	3.2938
	1	0.1645	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.4416	0.4981	10.359	1.456	23.869	16.231	3.669
MAHARASHTRA	10	0.5347	0.4038	10.717	1.629	24.378	19.835	4.746
	1	0.1871	0.2024	7.9919	65.417	0.4747	0.0000	20.734
	5	0.3298	0.5535	0.7755	43.283	1.4862	4.9329	21.131
HARYANA	10	0.4662	1.9928	0.7208	45.394	0.7581	3.7206	24.901
	1	0.2387	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.5205	2.545	12.152	1.193	0.022	1.077	2.302
GUJRAT	10	0.6846	3.967	15.305	1.589	0.040	1.390	1.343
	1	0.2851	0.00	0.00	0.00	0.00	0.00	0.00
	5	0.7150	10.982	1.010	1.187	1.260	0.345	2.989
TAMILNADU	10	0.1.04	40.644	0.931	2.681	0.931	0.703	2.575

Source: Author's own computation

The MIS Punjab, Andhra and West Bengal are prone to policy driven. EVD table shows Punjab more sensitive towards services and agriculture businesses, Andhra towards industry and manufacturing and Bengal towards manufacturing and services.

Middle Income States	*Period*	*SE*	*BNI*	*CONS*	*INDS*	*MANF*	*SERV*	*AGRI*
	1	0.236	3.270	2.013	17.578	1.682	0.000	16.131
	5	0.619	1.777	16.954	16.762	2.584	5.287	21.571
KERALA	10	0.859	1.307	21.023	12.716	2.373	5.593	25.479
	1	0.215	1.803	7.062	2.664	1.790	16.625	15.633
PUNJAB	5	0.518	3.294	3.342	2.508	5.846	38.593	18.644
	10	0.668	5.843	4.854	6.141	6.858	35.390	19.261
	1	0.234	0.411	7.893	5.443	8.322	2.269	10.100
KARNATAKA	5	0.657	0.286	4.817	3.636	5.576	1.105	47.389
	10	0.900	0.321	5.508	3.691	4.676	0.810	50.677
	1	0.246	0.811	0.271	56.775	21.487	2.058	0.695
ANDHRA	5	0.622	1.410	5.036	57.165	22.401	0.705	0.622
PRADESH	10	0.806	1.099	6.817	58.047	20.884	0.460	0.806
	1	0.251	2.567	4.663	0.073	27.038	8.769	3.984
WEST BENGAL	5	0.656	0.423	15.022	3.157	20.596	33.495	1.739
	10	0.866	0.280	19.067	3.027	19.064	35.670	2.261

Source: Author's own computation

The LIS Rajasthan, Jharkhand and UP responded to policy shock. EVD table shows its deep composition. In Rajasthan banking and agriculture sector responded to policy shock more efficiently, Jharkhand to manufacturing and construction and UP to agriculture and industry.

Lower Income States	*Period*	*SE*	*BNI*	*CONS*	*INDS*	*MANF*	*SERV*	*AGRI*
	1	0.224	0.000	0.000	0.000	0.000	0.000	0.000
	5	0.706	26.634	2.132	0.415	4.656	0.201	43.825
RAJASTHAN	10	1.210	23.812	1.920	0.209	10.919	0.188	54.887
	1	0.225	4.797	0.357	15.782	6.849	0.866	0.866
	5	0.496	4.975	15.291	11.770	13.735	5.972	5.972
JHARKHAND	10	0.617	5.438	14.654	11.406	14.923	7.383	7.383
	1	0.257	0.112	1.352	6.854	0.003	10.435	0.099
	5	0.597	2.023	1.418	6.672	0.092	25.577	6.920
CHATTISGARH	10	0.762	1.424	2.556	4.466	0.194	29.413	8.364
	1	0.228	4.590	4.589	0.932	0.544	25.501	22.837
MADHYA	5	0.511	13.310	3.272	9.473	2.918	16.215	18.098
PRADESH	10	0.825	14.345	4.478	13.811	4.401	24.808	12.666
	1	1.374	0.000	0.000	0.000	0.000	0.000	100.00
	5	1.804	4.631	15.794	4.256	1.600	0.405	72.218
ODISHA	10	1.840	4.506	15.301	4.140	2.260	0.396	69.900
	1	0.233	0.000	0.000	0.000	0.000	0.000	0.000
UTTAR	5	0.564	1.645	0.112	3.470	1.523	25.531	1.371
PRADESH	10	0.752	3.109	0.095	4.074	2.404	26.622	1.589
	1	0.248	0.000	0.000	0.000	0.000	0.000	0.000
BIHAR	5	0.611	1.620	0.323	7.782	0.049	15.337	1.729
	10	0.702	2.606	0.477	8.053	0.041	15.190	1.963

Source: Author's own computation

The India Special States are those states which come under special categories due to their international borders, and hence they should be in line with other Indian states. The Sikkim and Tripura severely responded to policy shocks, and hence Sikkim is more responsive towards construction, manufacturing and Tripura to construction, industry whereas J/K is responsive to banking and industries. Nagaland is responsive to construction and industry, Manipur to banking and manufacturing, and Meghalaya to industry and agriculture have responded mellow to policy shocks.

Special States	*Period*	*SE*	*BNI*	*CONS*	*INDS*	*MANF*	*SERV*	*AGRI*
	1	0.2471	7.2427	32.260	20.007	2.833	0.000	25.192
HIMACHAL	5	0.8592	35.265	25.614	28.873	1.924	0.733	5.867
PRADESH	10	8.7098	48.634	16.776	30.928	0.492	0.116	2.773
	1	0.280	10.665	0.211	11.696	2.436	0.00	2.919
JAMMU &	5	0.334	18.984	2.375	11.377	7.046	1.346	5.996
KASHMIR	10	0.337	19.442	2.538	11.458	7.097	1.429	5.947
	1	0.274	0.260	3.281	20.415	9.220	0.00	2.979
UTTARAKHAND	5	0.335	10.492	12.171	15.829	7.812	4.072	2.841
	10	0.336	10.594	12.358	15.782	7.762	4.070	2.822
	1	0.215	0.00	4.198	13.610	0.288	0.00	0.135
ASSAM	5	0.452	7.114	48.108	5.426	3.462	2.438	14.388
	10	0.453	7.113	48.027	5.425	3.515	2.441	14.453
	1	0.241	2.660	1.772	0.402	7.801	0.00	0.942
ARUNACHAL	5	0.348	24.298	3.140	1.609	8.763	8.859	7.347
PRADESH	10	0.351	24.660	3.101	1.649	8.798	9.180	7.308
	1	0.246	0.613	8.075	0.822	15.656	0.00	0.066
SIKKIM	5	0.303	4.812	16.982	12.505	11.195	2.220	1.378
	10	0.305	5.127	17.168	12.425	11.119	2207	1.448
	1	0.259	0.00	0.156	10.910	0.1622	0.00	13.473
MEGHALAYA	5	0.3107	2.751	2.978	15.313	3.7066	2.2427	19.144
	10	0.3108	2.755	3.009	15.321	3.7557	2.2487	19.158
	1	0.249	0.00	14.723	25.934	0.615	0.00	7.226
TRIPURA	5	0.367	6.991	33.160	15.362	1.281	8.667	9.215
	10	0.404	10.963	31.640	13.118	1.858	9.586	11.263
	1	0.234	0.00	0.015	1.353	5.154	0.00	2.357
MANIPUR	5	0.305	11.025	4.057	5.301	19.456	2.750	2.231
	10	0.305	11.048	4.096	5.296	19.434	2.776	2.240
	1	0.224	0.00	22.848	13.656	7.736	0.00	0.409
NAGALAND	5	0.346	3.074	17.914	29.113	4.183	6.530	15.192
	10	0.347	3.071	17.878	29.044	4.171	6.521	15.409

Source: Author's own computation

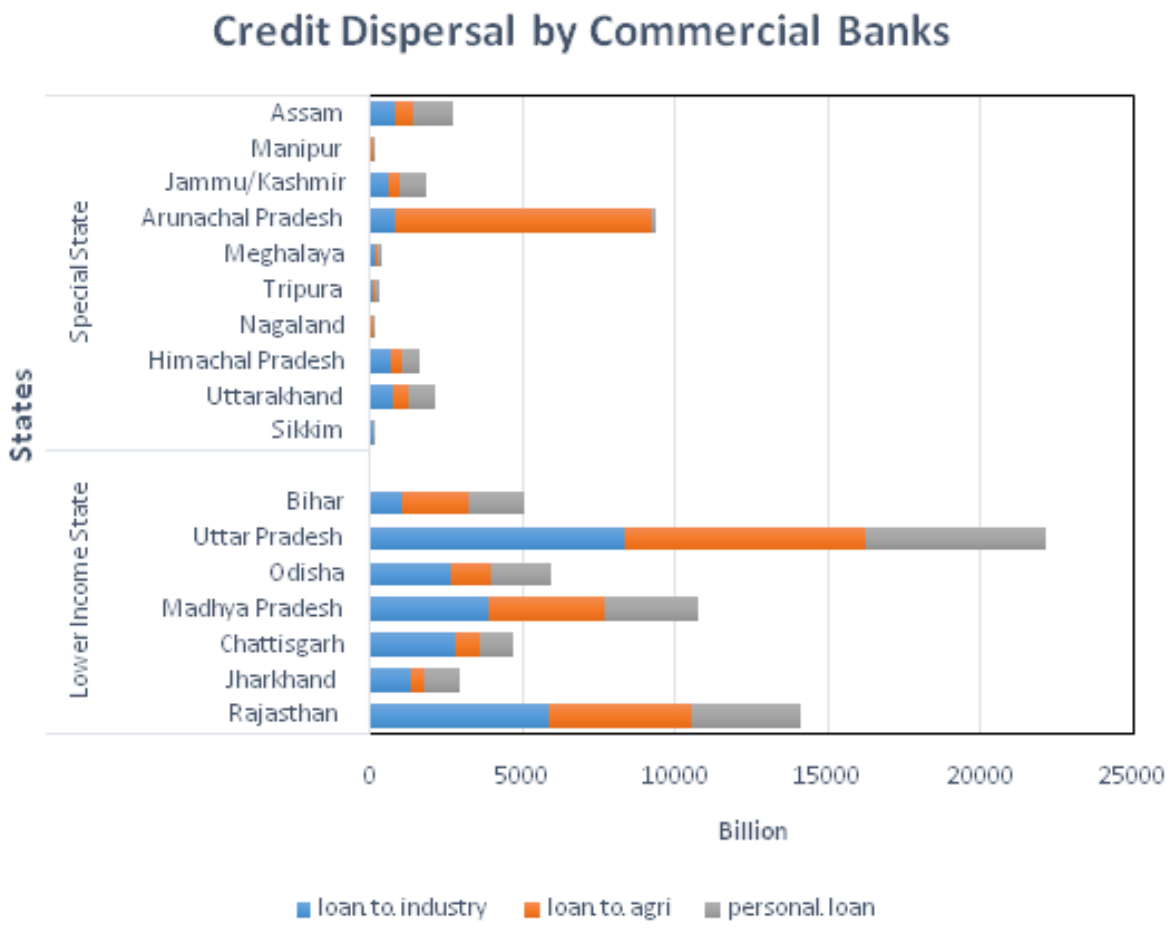
Note: Variance decomposition share in the GDP Proportion that is, Standard error (SE), Banking and Insurance (BNI), Construction (CONS), Industries (INDS), Manufacturing (MANF), Services (SERV) and Agriculture (AGRI).

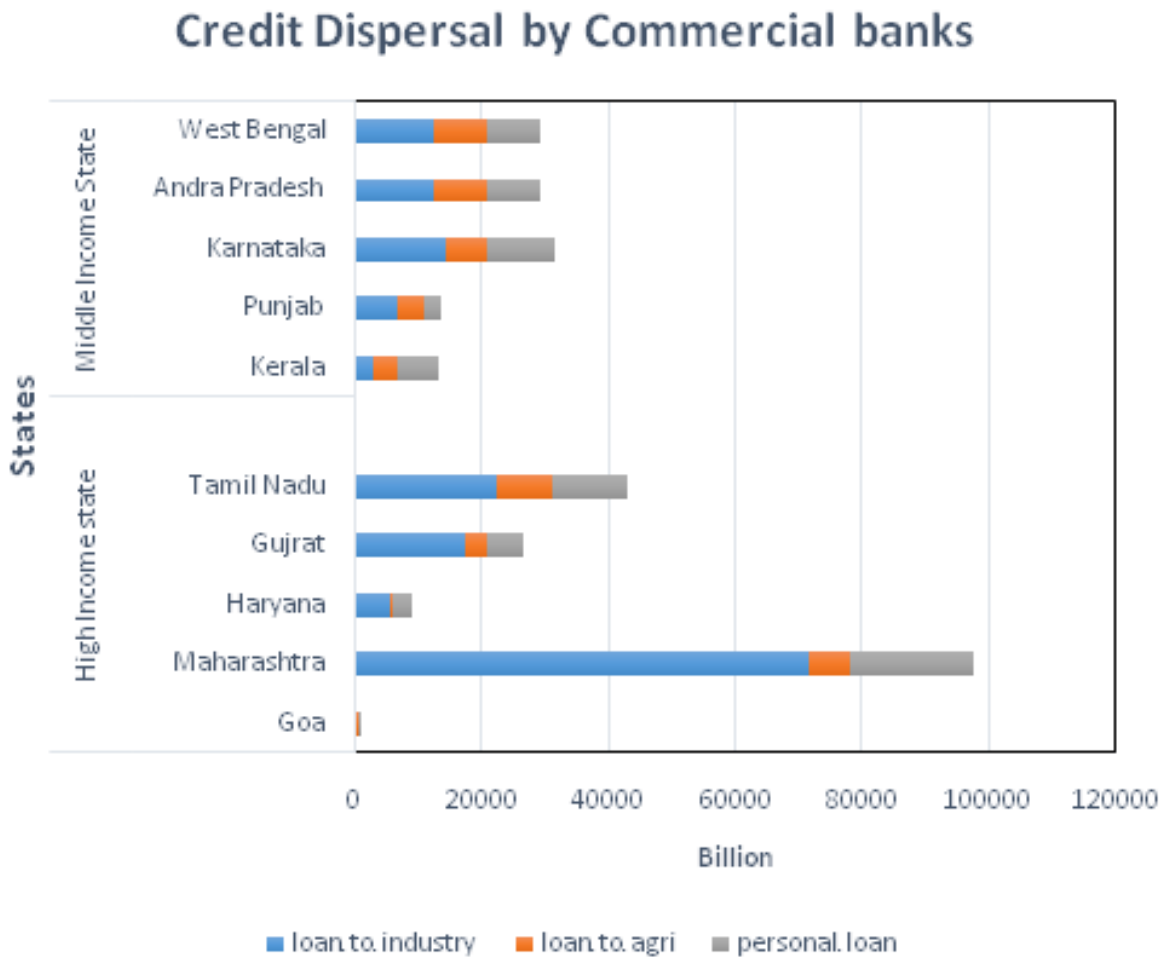
It is to be kept in mind that special states may not have large industry or construction sector but their dependence towards banking finance can be more as compared to other state like Gujarat, and this may cause changes in SGDP factors. This clarifies that sector wise variation cannot explain intensity of policy percolation. Rather, it depends on the nature of borrowing of that state firms.

Conclusion:

In this study, I have the analysed monetary policy transmission across Indian regions, for which I have constructed VAR model and employed SGDP, DGP.D, GFCF to measure the changes in state economy due

unanticipated policy rate shock 'repo rate' with time duration from 1993 to 2017. I argue that change in the policy rate will vary because that depends on the nature of state's financial behavior and the state's firms' nature of borrowing (that whether they are inclined to external or internal borrowing) which contradict DM Nachane, Parth Ray, Saibal Ghosh 2002 finding who asserted that those states which incline towards manufacturing are more responsive towards policy shock "in case of India". I further employed Variance decomposition model to understand the sector wise response toward change in the policy rate I found that all the states with different sectors reacted asymmetrically to the policy shock. With this analysis it can be pre-assessed which sector of SGDP will more be affected while altering the policy levers. I have not asserted whether the policy rate should vary across states albeit this calls for future research nor present any evidence of firm's financial dependence.





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