

CAMEL Analysis of RRBs Using Taxonomic Approach

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Abstract: *Since the adoption of financial sector reforms in response to the economic crisis in the latter half of the nineties, banks in India have been subjected to spate of dynamic regulatory standards of global financial resilience in order to enable them to operate in an increasingly competitive market environment. These include prudential norms on capital adequacy and NPA provisioning as also (of late) bank mergers, ostensibly to bolster their financial viability and efficiency. The paper enquires into the contemporary wisdom of 'Bank-mergers in the context of the amalgamation of RRBs as the policy response in regard to their impact on financial inclusion at large. It endeavors to develop a financial efficiency-cum inclusion index in order to analyze the impact of amalgamation of RRBs on Financial Efficiency and financial inclusion. It finds that the impact on the RRB amalgamation on financial efficiency has been largely 'modest' in the post-amalgamation period, and largely at the expense of their erstwhile mandate of being the 'engine of financial inclusion'.*

Keywords: *Rural credit, Institutional Reforms, Bank regulation & supervision, CAMELs, RRBs, Amalgamation, Financial Inclusion, Taxonomic methodology*

1. INTRODUCTION

The onset of financial sector reforms in response to the economic crisis during the early-1990s led to a spate of changes in policy, regulation and practices in the banking sector as well. These changes cumulatively phrased as the "second phase of economic reforms" or 'banking sector reforms' in the latter half of the nineties, were intended to equip banks on certain regulatory standards of global financial resilience, thereby withstand & operate in an increasingly competitive environment. Contemporary regulatory wisdom on the imperative towards adoption of regulatory standards aimed at enhancing banking systems and procedures to international standards and also simultaneously fortifying their financial positions (Toor 2006¹).

Despite the general approach of the financial sector reform process to establish regulatory convergence among institutions involved in broadly similar activities, given the large systemic

implications of the commercial bank intermediation, many of the regulatory and supervisory norms were initiated first for commercial banks and were later extended to other types of financial intermediaries (Mohan, 2005). Also given the preponderant presence and role of banking in general; on economic activity and the important role of state-owned banks in the economy (i.e. capital formation), banks have been under regulatory focus more than any other type of economic unit in the economy.

The structure of the paper is as follows: The section following the introduction or section 2, describes the evolution of institutional reforms in rural credit. This is followed by a brief review on the evolution of consolidation of RRBs as pertaining to the united state of Andhra Pradesh in section 3. Section 4 provides an in depth treatment of the taxonomic method for computation of standardized index scores for appropriate comparisons. Methodology and analysis of the sample data have been elaborated in section 4, followed by results and conclusion in Section 5, the final section.

2. INSTITUTIONAL REFORMS IN RURAL CREDIT, SUPERVISION OF RRBS, CONSOLIDATION

The multi-agency² approach in rural credit has been highlighted as the policy response from the early 1970s to the difficulties faced by rural areas in accessing financial services. Bank nationalization in the 1970s while bringing in the social mandate; courtesy the public ownership did not result in the kind of penetration required for access of financial services in the rural areas. The economic liberalization of the 1990s instead sounded the death knell for 'social and development banking' in praxis during the earlier decades-with its focus on moving towards "standards of international best practices in prudential regulation and supervision" in the wake of financial liberalization on an across-the-board basis.

¹Toor (2006), 'Handbook of Banking Information', Skylark Publications pg. 1.2

²By the end of the 1970s, the rural finance architecture in India-comprised of three different institutions for providing rural credit-which is often described as the "multi-agency approach". These include the scheduled commercial banks (both public and private), the 3-tiered cooperative bank structure and the Regional Rural Banks or the RRBs (Srinivasan, State of Rural Finance in India, pg.4)

Despite the general approach of the financial sector reform process to establish regulatory convergence among institutions involved in broadly similar activities, given the large systemic implications of the commercial banks, many of the regulatory and supervisory norms that were initiated first for commercial banks, had been later indiscriminately extended to rural financial institutions including the RRBs as well.

These interalia comprised of regulations pertaining to capital adequacy, prudential and supervision norms that were applied equally to all banks, regardless of their ownership and mandates expected of them (Mohan, 2005). In the case of the RRBs also, reforms largely followed the pattern as that of commercial banks irrespective of their role in rural institutional finance, their special status in regard to the social mandates expected of them and the different set of policies hitherto governing them. By 2003-04, as a result of such reform measures large scale effects of rural disintermediation in the form of rampant agrarian distress and stagnation of the rural economy became discernibly evident.

Notwithstanding the above, various committees set up to look into the issue of restructuring of the RRBs have inordinately stressed upon the issues of 'ownership and capital adequacy' in the wake of persistent rise in the NPA levels-almost to the exclusion of institutional³ dimensions of their rural credit activity (Velayudham and Sankaranarayanan, 1990; RBI, 1997; Thorat, 2001; Ruthven et.al, 2003; Bose, 2005; Satish, 2004, 2007; Vasam, 2008; Srinivasan, 2016). The amalgamation of the RRBs that followed ended up being the 'soft policy response' to address the pressing need of enhancing viability and profitability.

3. CONSOLIDATION OF THE RRBs

So far there have been two broad phases in the amalgamation of the RRBs in the country. In the first phase (September 2005-March 2010), RRBs of the 'same sponsor' banks 'within the state' were amalgamated bringing down their number to 82 from 196. The second and ongoing phase, starting from October 2012, geographically contiguous RRBs 'within a state' under 'different sponsor banks' would be amalgamated to have just one RRB in medium-sized states and two/three RRBs in large states (Srinivasan, 2016). In the recent phase of consolidation which began in October 2012, by merger of RRBs across sponsor banks within a State, the number⁴ of RRBs has further reduced to 64 as on March 2013 with over 17,856 branches in 635 districts notified in 26 states.

In the united state of Andhra Pradesh⁵, as on end March 2003, there were 16 RRBs which, later under a two-stage process of

³For details on the institutional dimensions of RRBs, see Thorat (2001)

⁴The number of RRBs now stands further reduced to 56 by virtue of further consolidation since then.

⁵The number of RRBs since the amalgamation in 2005 and 2006 have remained at 5; and continued since then despite the creation of the

amalgamation were reduced in number to 8 RRBs as on end March 2006, and later were further reduced subsequently to 5 RRBs as on end March 2007. The number of RRBs as regards the united state of AP has remained at 5 RRBs since then. **Table 1** below shows the details regarding the number of RRBs merged at different stages in the above period.

TABLE 1: Evolution of AP RRBs: 1999-2011 (Across the period of Amalgamation)

AS ON MARCH					
2003		2006		2007	
S.No	Name of the RRB	S.no	Name of the rrb	S.No	NAME OF THE RRB
1	Nagarjuna GB	1	APGVB	1	APGVB
2	Sri Visakha GB				
3	Sangameshwra GB				
4	Manjira GB				
5	Kakathiya GB	2	CGGB	2	CGGB
6	Chaitanya GB				
7	Godavari GB	3	TGB	3	TGB
8	Sri saraswathi GB				
9	Sathavahana GB				
10	Golconda GB				
11	Srirama GB	4	Kanakadurga GB	4	SAPTAGIRI
12	Kanakadugra GB				
13	Shri Venkateshwara GB	5	Shri Venkateshwara GB	5	APGB
14	Pinakini GB	6	Pinakini GB		
15	Rayalseema GB	7	Rayalaseema GB		
16	Sree Anantha GB	8	Sree Anantha GB		

Source: NABARD documents

4. DEVISING INDEX USING TAXONOMIC METHODOLOGY APPROACH⁶:

The **taxonomic method**⁷, which was designed by a group of Polish mathematicians in 1952, enables the determination of homogeneous units in an n-dimensional space without having to employ statistical tools such as regression and variance. It

separate state of Telangana from the united state of Andhra Pradesh in mid-2014.

⁶The author is deeply grateful to Dr. Shaveta Kohli, Assistant Professor, Central University of Jammu for having introduced the above taxonomic methodology in regard to the analysis of the data for the study.

⁷For details on Index computation using the Taxonomic approach see Srimanta Mohanty (1999), 'Regional Analysis of Human Development in Canada'

was recommended in 1968 to the United Nation's Educational Scientific and Cultural Organization (U.N.E.S.C.O) as a tool for ranking, classifying and comparing countries by levels of development. More recently, the method has been applied successfully to measure the levels of development of developing and developed countries. This method is chosen because it is suited for ranking, comparing and classifying regions of a country by levels of development, standard of living, status or any other such aspect.

Also this method is free from choice of weights as weights are built in the system itself. It may be noted that the 'taxonomic method' does not place any limit on the number of indicators to be selected and used. This study is a useful tool in identifying indicators or spatial imbalances in development with the view of setting up targets in allocation of scarce resources (Mohanty, 1999).

5. ANALYSIS OF SAMPLE DATA

The methodology adopted regarding our objective of analyzing the performance of RRBs of united AP for the period of our study (1999-2011) across the period of amalgamation is as follows:- The sample data of regional rural banks (henceforth, RRBs) of the state of united Andhra Pradesh (AP) comprised of data for a period of 11 years (1999-2011). As part of sample data, a select range of proxy variable measures under each of the five CAMEL indicators; along with the sixth 'Inclusion' indicator have been considered for the study. **Annexure-1** exposts on list of various proxy variables considered for each of the six parameters including the 'Inclusion' parameter under the CAMEL-I framework for the study. Under the study objective regarding evaluation of AP RRBs in regard to financial efficiency and inclusion, across the period of their amalgamation; sample period was considered as a whole of two sub-periods viz. the pre-merger period of 5 years (1999-2003) and the post-merger period of 6 years (2006-2011).

Step 1:

Initially year wise index scores for each of the five CAMEL parameters and the Inclusion parameter were computed using the annual data on the respective proxy variables for each of the six CAMEL-I parameters for all the 16 RRBs for the pre-merger period (1999-2003) and later using the same proxy variables for all 5 merged RRBs for the post merger period (2006-2011). These parameter-wise index scores for all the 11 years were computed using the Taxonomic methodology described in the earlier sections of this chapter. The advantage of the Taxonomic methodology lies in the fact that it provides normalized indices values for each CAMEL parameter and the

'Inclusion' parameter using its proxy variables notwithstanding the fact that the each of the proxy variables are of different units / denominations.

Step 2:

Once the year-wise normalized indices for all the six parameters (i.e. five CAMEL parameters and the 'Inclusion' parameter) are obtained for each of the 16 RRBs for the sub-period 1 (or the pre-merger period), we compute a year-wise composite weighted CAMEL score using differential weights under the "Modified CAMEL APPROACH"⁸ for the pre-merger period as in Table 2A.

The weights chosen for computing the composite CAMEL score is based on the relative order of significance among the five CAMEL parameters as considered under standard norms of bank resilience and long run viability. The details of the differential weights chosen to compute the composite CAMEL score is given in Table 3 ahead in the chapter. The adjoining columns to each year-wise weighted CAMEL scores (abbreviated as CWS in the table) in Table 2A provide the ranks for the same scores.

Observation

Notice that the last two columns in bold of Table 2A provide the composite CAMEL weight scores for all the 16 RRBs and its relative ranking for the year 2003. A close look at the scores along the CWS_03 column reveals that out of the 16 RRBs; about 9 RRBs registered a composite score of close to 0.5 and above, while the other RRBs had a composite score of 0.4 or less.

It may be noted that these scores are normalized and lie in the range of 0-1 which implies that most operational RRBs in the year 2003 had a CAMEL efficiency of about 50 percent. This implied that most of the RRBs have been able to realize their CAMEL efficiency to close to 50 percent by 2003 prior to the amalgamation itself.

Step 3: Once the year-wise composite weighted CAMEL score using differential weights under the "Modified CAMEL APPROACH" for the pre-merger period (1999-2003) is obtained, we consider the Trend Average of the composite weighted CAMEL score to get one single CAMEL value for the entire pre-merger period for all the 16 RRBs. At the same time, in order to compare the performance of the 16 RRBs over the period (1999-2003), we also compute the rank

⁸ The Modified CAMEL technique used has been adopted from Sri Harsha (2012) and is based on the use of weights for computing the composite CAMEL score.

differences using the CAMEL values of 1999 and 2003 for the sample data (Table 2B).

Observation:

A close comparison of the composite weighted CAMEL values for the years 1999 and 2003 reveals the following:- The rank differences column from the Table 2B clearly shows that of all the 16 RRBs only 6 RRBs show distinctive positive rank differences which implies a clear improvement in their relative CAMEL standings over the period. Of these 6 RRBs, 2 RRBs (viz. Sri Visakha GB, and Godavari GB) registered a significant improvement in their CAMEL performance while other 4 RRBs (Chaitanya GB⁹, Pinakini GB, Sri Venkateswara GB and Golconda GB) indicate a marginal improvement in their CAMEL performances.

Most of the other 10 RRBs either remained stagnant (with a rank difference of zero) or deteriorated (as indicated by their negative rank difference scores) during this period. As already observed earlier, in absolute terms; most of the RRBs for the year 2003 had a CAMEL efficiency score of 0.4 (or about 40 percent) which was only marginally better than at 0.31 (or about 31 percent) in 1999. This is despite the indiscriminate extension of prudential regulatory and supervisory norms to the RRBs with the explicit intent to ensure “better and robust” standards of banking operation in a fast liberalizing environment.

Table 2B also provides the Trend Average of CAMEL scores and the adjoining ranks column gives its relative efficiency standings for the entire pre-merger period. Further, many RRBs had achieved better results by moving away from their mission of serving the poor—either by putting their money into investments rather than lending it, or by lending to non-poor clients as manifested by the persistent increase in loan size and bias against women borrowers (Thorat 2001¹⁰). This period also witnessed a rise in dependence of rural poor on informal credit (Satish, 2007; Srinivasan 2016). Such a persistent retreat by the RRBs during the latter half of the 90s and for a major part of the 2000s decade seemingly have defeated the central objective of rural development policy to ‘deepen and widen’ financial access to historically excluded communities.

Step 4:

Recall that as mentioned in Step 1, we compute year wise normalized Indices for the ‘Inclusion’ parameter using the annual data on its respective proxy variables for all the 16 RRBs for the pre-merger period (1999-2003) (Table 3A).

⁹ GB stands for Grameen Bank.

¹⁰ See Thorat, Bhatt (2001), ‘India’s Regional Rural Banks-The Institutional Dimension of Reforms, pg.66, Vol 3.

Notice that the last two columns in bold of Table 3A provide the ‘Inclusion’ index scores for all the 16 RRBs and its relative ranking for the year 2003.

Observation:

A fair look at the scores in the column Incl. Index value for the year 2003 (i.e. Incl. IV _03) reveals that out of the 16 RRBs; barring about one RRB (which had an ‘Inclusion’ efficiency score of over 0.5) most of other RRBs had an average score of 0.30 while one of RRBs (i.e. Sri Saraswathi GB) even registered negative ‘inclusion’ efficiency values as well. Considering that these scores are normalized and lie in the range of 0-1 one finds that average inclusion efficiency of RRBs in the year 2003 was about 0.25 (or about 25 percent)

Step 5:

Next we consider the Trend Average of the Inclusion score to get one single Inclusion value for the entire pre-merger period for all the 16 RRBs. At the same time, in order to compare the performance of the 16 RRBs in regard to the ‘Inclusion’ parameter over this period, we also compute the rank differences using the ‘Inclusion’ values of 1999 and 2003 for the sample data (Table 3B).

Observation:

A close comparison of the ‘Inclusion’ values for the years 1999 and 2003 reveals the following:- The rank differences column from the Table 3B clearly shows that of all the 16 RRBs only 7 RRBs show distinctive positive rank differences which implies a clear improvement in their relative ‘Inclusion’ standings over the period. Of these 7 RRBs, 3 RRBs (viz. Chaitanya GB, Godavari GB and Sri Anantha GB) registered a significant improvement in their ‘Inclusion’ performance while other 4 RRBs (Nagarjuna GB, Sri Vishaka GB, Manjira GB, and Kanakadurga GB) indicate a marginal improvement in their ‘Inclusion’ performances as evident from their relative rank standings. All of the other 9 RRBs deteriorated (as indicated by their negative rank difference scores) during this period.

As already observed earlier, in absolute terms; most of the RRBs for the year 2003 had an average ‘Inclusion’ efficiency score of 0.25 (or about 25 percent) which was worse than at 0.31 (or about 31 percent) in 1999. This clearly illustrates that impact of prudential regulation did not improve the lot of RRBs in regard to financial viability in terms of their CAMEL scores on the one hand, but certainly led to worsening of their absolute performances in regard to ‘Inclusion’ during the same period. Table 3B also provides the Trend Average of ‘Inclusion’ scores and the adjoining ranks column gives its relative efficiency standings for the entire pre-merger period.

TABLE 2A: Pre-Merger Year-wise CAMEL Weighted Score-& Ranks (1999-2003)

S. No	Name of the RRB	¹¹ CWS_99	RK_99	CWS_00	RK_00	CWS_01	RK_01	CWS_02	RK_02	CWS_03	RK_03
1.	Nagarjuna GB_99	0.241	12	0.262	12	0.285	14	0.351	14	0.385	13
2.	RayalaSeema GB	0.474	1	0.390	6	0.679	1	0.707	1	0.642	1
3.	Sri Visakha GB	0.202	15	0.245	15	0.469	10	0.579	6	0.530	6
4.	Sri Anantha GB	0.462	2	0.406	5	0.561	5	0.638	3	0.617	3
5.	Sree Venkateswara GB	0.327	10	0.326	9	0.596	2	0.533	10	0.493	8
6.	Sri Saraswathi GB	0.354	6	0.314	10	0.416	11	0.564	8	0.476	9
7.	Sangameswara GB	0.350	7	0.442	3	0.591	3	0.647	2	0.438	12
8.	Manjira GB	0.443	3	0.465	2	0.527	6	0.558	9	0.328	14
9.	Pinakini GB	0.406	5	0.412	4	0.525	7	0.475	11	0.636	2
10.	Kakatiya GB	0.230	14	0.218	16	0.357	13	0.033	16	0.065	16
11.	Chaitanya GB	0.338	9	0.278	11	0.502	8	0.627	4	0.538	5
12.	ShriSaathavahana GB	0.321	11	0.254	14	0.239	16	0.309	15	0.174	15
13.	Golconda GB	0.236	13	0.475	1	0.582	4	0.611	5	0.465	10
14.	Srirama GB	0.407	4	0.327	8	0.469	9	0.573	7	0.495	7
15.	Kanakadurga GB	0.341	8	0.345	7	0.381	12	0.455	12	0.442	11
16.	Godavari GB	0.185	16	0.260	13	0.249	15	0.432	13	0.584	4

TABLE 2B: Pre-Merger CAMEL Weighted Score-& Ranks & Rank Differences (1999 and 2003 only) with Trend Average (TA) (1999-2003)

S. No	Name of the RRB	*CWS_99	RK_99	CWS_03	RK_03	#RK_DIFF	**CWS_TA	CWS TA_RK
1.	Nagarjuna GB_99	0.241	12	0.385	13	-1	0.305	14
2.	RayalaSeema GB	0.474	1	0.642	1	0	0.578	1
3.	Sri Visakha GB	0.202	15	0.530	6	9	0.405	11
4.	Sri Anantha GB	0.462	2	0.617	3	-1	0.537	2
5.	Sree Venkateswara GB	0.327	10	0.493	8	2	0.455	8
6.	Sri Saraswathi GB	0.354	6	0.476	9	-3	0.425	10
7.	Sangameswara GB	0.350	7	0.438	12	-5	0.494	3
8.	Manjira GB	0.443	3	0.328	14	-11	0.464	6
9.	Pinakini GB	0.406	5	0.636	2	3	0.491	4
10.	Kakatiya GB	0.230	14	0.065	16	-2	0.181	16
11.	Chaitanya GB	0.338	9	0.538	5	4	0.457	7
12.	ShriSaathavahana GB	0.321	11	0.174	15	-4	0.259	15
13.	Golconda GB	0.236	13	0.465	10	3	0.474	5
14.	Srirama GB	0.407	4	0.495	7	-3	0.454	9
15.	Kanakadurga GB	0.341	8	0.442	11	-3	0.393	12
16.	Godavari GB	0.185	16	0.584	4	12	0.342	13

*CWS_99 and CWS_03 -implies composite CAMEL weight scores for 1999 and 2003. Here RK_99 and RK_03 provide the ranks for the CAMEL scores for year 1999 and 2003 in the descending order. #RK_DIFF- is for rank differences, and **CWS_TrendAvg stands for trend average of weighted CAMEL score for the entire period 1999-2003.. RK CWS_Trend gives the ranks for the values of the column CWS_Trend Avg.

¹¹ CWTS_99-implies composite CAMEL weight scores for 1999 and so on for other years as well. RK_99 implies that ranks for the year 1999 which are in the descending order and so on for similar years as well.

TABLE 3A: Pre-Merger Year-wise Inclusion Score-& Ranks (1999-2003)

S No	Name of the RRB	*Incl IV_99	**RK_99	Incl IV_00	RK_00	Incl_IV_01	RK_01	Incl_IV_2002	RK_02	Incl_IV_03	RK_03
1	Nagarjuna GB	0.259	14	0.305	9	0.223	7	0.339	6	0.206	10
2	Rayalaseema GB	0.261	11	0.318	8	0.208	9	0.208	15	0.185	14
3	Sri Visakha GB	0.256	15	0.195	13	0.168	12	0.262	9	0.200	11
4	Sri Anantha GB	0.244	16	0.239	11	0.215	8	0.254	10	0.281	7
5	Sree Venkateswara GB	0.261	9	0.248	10	0.164	13	0.278	8	0.193	12
6	Sri Saraswathi GB	0.259	13	0.073	15	0.001	16	-0.119	16	-0.022	16
7	Sangameswara GB	0.269	3	0.405	3	0.303	5	0.352	5	0.310	6
8	Manjira GB	0.266	6	0.385	5	0.312	4	0.233	12	0.336	4
9	Pinakini GB	0.269	4	0.430	2	0.186	11	0.243	11	0.079	15
10	Kakatiya GB	0.265	7	0.352	7	0.287	6	0.360	4	0.259	8
11	Chaitanya GB	0.260	12	0.397	4	0.207	10	0.443	3	0.377	2
12	ShriSaathavahana GB	0.861	1	0.230	12	0.145	14	0.225	13	0.226	9
13	Golconda GB	0.261	10	0.150	14	0.109	15	0.217	14	0.187	13
14	Srirama GB	0.272	2	0.595	1	0.479	1	0.469	2	0.335	5
15	Kanakadurga GB	0.268	5	0.374	6	0.338	3	0.282	7	0.344	3
16	Godavari GB	0.264	8	0.004	16	0.408	2	0.504	1	0.519	1

*Incl_IV_99-implies Inclusion Index value for 1999 and so on for different years.

**RK_99 gives the ranks for the values of the column Incl_IV_99. Here the ranks are in the descending order.

TABLE 3B: Pre-Merger Inclusion Scores, Ranks & Rank Differences (1999 and 2003 only) with Trend Average (TA) (1999-2003)

S No	Name of the RRB	*Incl IV_99	RK_99	INCL_03	RK_03	#RK_DIFF	**INCLTA	INCL_TA _RK
1	Nagarjuna GB_99	0.259	14	0.206	10	4	0.266	9
2	RayalaSeema GB	0.261	11	0.185	14	-3	0.236	12
3	Sri Visakha GB	0.256	15	0.200	11	4	0.216	14
4	Sri Anantha GB	0.244	16	0.281	7	9	0.246	10
5	Sree Venkateswara GB	0.261	9	0.193	12	-3	0.229	13
6	Sri Saraswathi GB	0.259	13	-0.022	16	-3	0.039	16
7	Sangameswara GB	0.269	3	0.310	6	-3	0.328	5
8	Manjira GB	0.266	6	0.336	4	2	0.306	7
9	Pinakini GB	0.269	4	0.079	15	-11	0.242	11
10	Kakatiya GB	0.265	7	0.259	8	-1	0.305	8
11	Chaitanya GB	0.260	12	0.377	2	10	0.337	4
12	ShriSaathavahana GB	0.861	1	0.226	9	-8	0.337	3
13	Golconda GB	0.261	10	0.187	13	-3	0.185	15
14	Srirama GB	0.272	2	0.335	5	-3	0.430	1
15	Kanakadurga GB	0.268	5	0.344	3	2	0.321	6
16	Godavari GB	0.264	8	0.519	1	7	0.340	2

* Incl_IV_99-implies Inclusion scores for 1999 and so on. #RK_DIFF- is for rank differences, and

**INCL Trend Avg stands for Trend Average Inclusion pre-merger score for the entire pre-merger period 1999-2003. INCL_Avg_RK gives the ranks for the values of the column INCL_AVG. Here the ranks are in the descending order.

Step 6: As mentioned in Step 3 after computing the composite weighted CAMEL score using differential weights under the “Modified CAMEL APPROACH” for the entire pre-merger period (1999-2003)- we compute the rank differences using the weighted CAMEL values of the sample data for 1999 and 2003 alone. This is done in order to compare the performance of the 16 RRBs over this period. Additionally we also compute a new measure termed the “Progress Ratio” which is nothing but the ratio between the ‘composite weighted score (CWS) for CAMEL obtained by an RRB in 2003 to the score in 1999 (Table 4).

This method regarding computation of the composite CAMEL value using the “Modified Weighted CAMEL Ratio” approach and calculation of the Progress ratio has been adopted from previous¹² studies. Higher the Progress ratio implies-better the performance by the RRB over the period. Progress ratio (PR) indicates the relative performance of the RRB in a given year with reference to its performance in the base year (i.e. the base year for the pre-merger period under the study is 1999)
 Progress ratio (PR) = CWS for CAMEL for a given RRB in 2003/ CWS for CAMEL for a given RRB in 1999

For the pre merger period (1999-2003), all the 16 RRBs are categorized into five categories of Very Bad (VB), Bad (B), Medium (M), Good (G) and Very Good (VG) based on their associated progress ratio (PR) performances. The criterion in regard to the five-fold classification of PR values of RRBs is as given in Table 4 below:

TABLE 4: Criteria for Relative Classification of PR values for RRBs

S. No	Classification Criteria Limits for PR values	Progress Category Description
1.	If the PR value is less than ‘m-0.48s’	Very Bad Progression (VB)
2.	If the PR value is between ‘m-0.48s’ & ‘m-0.18’	Bad Progression (VB)
3.	If the PR value is between ‘m-0.18s’ & ‘m+0.18’	Medium Progression (M)
4.	If the PR value is between ‘m+0.18s’ & ‘m+0.48’	Good Progression (G)
5.	If the PR value is greater than ‘m+0.48s’	Very Good Progression (VG)

Using the above classification we reclassify all the 16 RRBs based on the computed PR values in terms of the 5-fold classification as given Table 5 below. The column adjacent to the PR values gives the Progress Category (PC) that categorizes each of the 16 RRBs based on their PR values.

¹² See Sriharsha (2012)

The last column of Table 5 indicates the name of the merged RRB adjacent to the group of RRBs that were amalgamated into it. This effectively illustrates the characteristics of all of the 16 RRBs in terms of their financial efficiency as proxied in terms of their CAMEL indices and the ‘PR’ values over the pre-merger period prior to their amalgamation.

Observation:

A closer and concurrent view of Table 5 especially the column on ‘rank differences’, Progress category (PC) and the combination / amalgamation of RRBs represented by the column ‘Name of the merged RRB’ entity reveals the following: Out of the total 16 RRBs, barring 6 RRBs (out of which one RRB had no rank difference); all the other RRBs recorded negative rank differences (i.e. RD column) which implies a deterioration in CAMEL performances in a relative sense over the period.

Given that the progress ratios reflect on the extant performance of the each RRB with regard to the base year (i.e. 1999) in an absolute sense; the columns of the PR values and category reveal the following: Here out of the 16 RRBs, (barring two RRBs); only 3 RRBs showed ‘Very Good (VG)’ progress; about seven RRBs showed ‘Medium progress’ while the others ended up in the ‘Bad’ or the ‘Very Bad’ categories. This clearly shows that the performance of the RRBs in the absolute sense had only marginally improved despite the various policy interventions and regulatory reforms undertaken (as discussed earlier) during this period.

6. ON THE AMALGAMATION OF THE RRBs

One of the major concerns during this period as pervasively highlighted under our study has been on the efficacy of the amalgamation process itself especially in regard to the two-fold criteria viz. firstly amalgamation about the ‘same sponsor-bank-wise within each state’ followed by the amalgamation about ‘different sponsor-banks within each state’ in an unseemly haste with the alleged intent to make them ‘internally-viable” and externally competitive. Our results on Progress ratios show that unlike the ideal case where ceteris paribus, an amalgamation of a weak bank/RRB with strong bank/RRB is usually advocated for enhancement of institutional & organization muscle; one finds that the amalgamation process resulted in a concentration of all weak banks in one group (for e.g. APGVB, SGB and TGB) and strong banks in the others (viz. CGGB) (Table 5).

That the entire mechanism of amalgamation had remained a non-starter in its impact on institutional viability can be illustrated from the trend line graphs indicating the weighted CAMEL trends averages in pre-and post merger period (Figure 1 & 2). A graphical comparison of trend average values of the pre-merger period of the 5 merged RRBs

(considering the original 16 RRBs to be merged into 5 RRBs), with the values for post merger period reveals the following:

7. TRENDS IN CAMEL SCORES (1999-2011)

A comparison of the year-wise trend average CAMEL scores across all RRBs for the pre-merger period and the post merger period reveals the following:

1. During the pre-merger period; one observes that the trend average of CAMEL score that had remained at

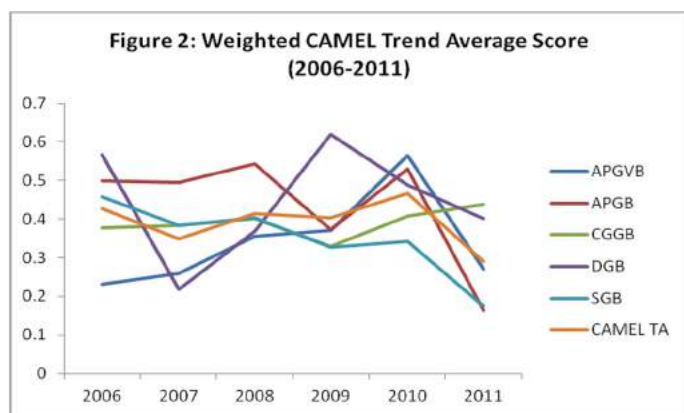
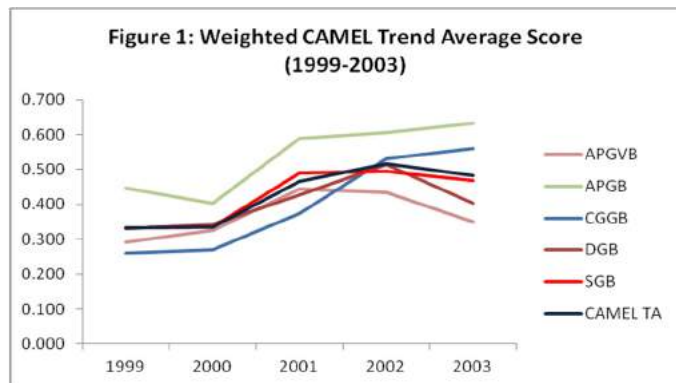
about 0.3 (or 30 percent)-in 1999 and 2000; gradually reached its highest maximum of over 0.5 (i.e. over 50 percent) in 2002 (Figure 1).

2. In the post-merger period, trend average of CAMEL score declined to about 0.4 (or 40 percent) by 2006, hovered about the same level till 2009 and later after a brief spurt in the year 2010, declined to its lowest value of less than 0.3 (30 percent) in 2011 (Figure 2).

TABLE 5: Comparison of Weighted Camel Score during 1999 & 2003

S.No	Name of the RRB	RD	CWS_99	RK_99	CWS_03	RK_03	PROG Ratio	¹³ PC	Name of the Merged Bank
1	Nagarjuna GB_99	-1	0.241	12	0.385	13	1.60	M	APGVB
2	Sri Visakha GB	9	0.202	15	0.530	6	2.63	VG	
3	Sangameswara GB	-5	0.350	7	0.438	12	1.25	B	
4	Manjira GB	-11	0.443	3	0.328	14	0.74	VB	
5	Kakatiya GB	-2	0.230	14	0.065	16	0.28	VB	
6	Royalaseema GB	0	0.474	1	0.642	1	1.35	M	APGB
7	Sri Anantha GB	-1	0.462	2	0.617	3	1.34	M	
8	Pinakini GB	3	0.406	5	0.636	2	1.57	M	
9	Chaitanya GB	4	0.338	9	0.538	5	1.59	M	CGGB
10	Godavari GB	12	0.185	16	0.584	4	3.16	VG	
11	Sri Saraswathi GB	-3	0.354	6	0.476	9	1.34	M	TGB
12	ShriSathavahana GB	-4	0.321	11	0.174	15	0.54	VB	
13	Golconda GB	3	0.236	13	0.465	10	1.97	VG	
14	Srirama GB	-3	0.407	4	0.495	7	1.22	B	SGB
15	Kanakadurga GB	-3	0.341	8	0.442	11	1.30	B	
16	Sree Venkateswara GB	-2	0.327	10	0.493	8	1.51	M	
	Min		0.185		0.065		0.280		
	Max		0.474		0.642		3.163		
	mean		0.332		0.457		1.462		
	Sd		0.092		0.159		0.707		
	m-0.48		-0.15				1.12		
	m-0.18		0.15				1.33		
	m+0.18		0.51				1.59		
	m+0.48		0.81				1.80		

¹³PC-stands for the Progress category column-classifies the 16 RRBs into 5 categories as into Very Bad (VB), Bad (B), Medium (M), Good (G) and Very Good (VG); This method regarding computation of the composite CAMEL value using the weighted approach and calculation of the Progress ratio has been adopted from Sri Harsha (2012) paper. CWS_99 implies CAMEL weighted score for the year 1999 and so on. RD implies Rank differences between rank scores for year 2003 (RK_03) and rank scores for year 1999



Trends in Inclusion scores (1999-2011): Similarly a year-wise trend average comparison on the ‘Inclusion’ index scores (obtained using the taxonomic methodology) followed by computation of ‘Progress ratios’ during 1999-03 reveals the following observations:

1. A comparison of the rank differences of the RRB in regard to their Inclusion performances for the years 1999 and 2003 alone indicates that out of a total of 16 RRBs, 9 RRBs registered negative values indicating a decline in rank positions in 2003 relative to that in 1999 (Table 6)

2. In fact the average Inclusion score across all the RRBs decreased from 0.3 (in 1999) to about 0.251 (in 2003). This effectively proves a worsening of inclusion efficiency had become a persistent trend during the pre-merger period itself independent of the amalgamation event itself. Incidentally the average CAMEL score across all the 16 RRBs had improved from 0.332 (in 1999) to 0.457 (in 2003) during the same period (Table 5). This effectively proves that the obsessive focus on commercial viability did marginally improve the overall financial resilience of the RRBs (in terms of their CAMEL scores) but led to a worsening on the ‘Inclusion’ front.

3. On the Inclusion Progress Ratios: The results of progress ratio (PR) values in regard to the ‘Inclusion’ as computed for the year 2003 considering the year 1999 as the base year reveal that about 9 of the total 16 RRBs had a PR value of less than 1 clearly indicating a worsened performance by the RRBs in regard to the ‘Inclusion efficiency’ in 2003 in comparison to their own inclusion levels realized in 1999 (Table 6).

4. A comparison of the year-wise trend average Inclusion scores across all RRBs for the pre-merger period and the post merger period reveals the following-

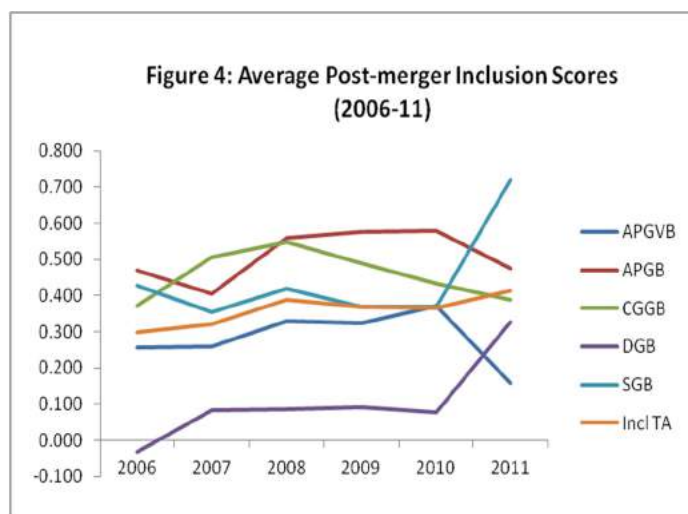
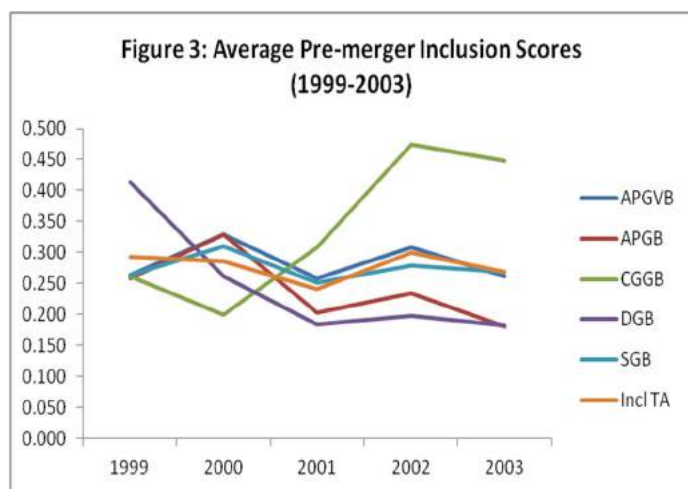
a. That the trend average of Inclusion score across all the RRBs had remained at about 0.3 (or 30 percent)-for the entire pre-merger period with minor fluctuations (Figure 3).

b. Similarly in the post-merger period, trend average of Inclusion score that remained at about 0.3 (or 30 percent) till 2007, later marginally increased to reach an average score close to 0.4 (40 percent) for remaining period (Figure 4). The absolute values of RRB scores in regard to both ‘CAMEL’ and ‘Inclusion’ parameters for the post-merger period (2006-2011) have been provided under Annexure 2 and 3.

TABLE 6: Comparison of Inclusion Score during 1999 & 2003

S No	Name of the RRB	RD	Incl IV_99	RK_99	IV_03	RK_03	PR	Name of the Merged Bank	INCL Trend_AVG (99-03)
1	Nagarjuna GB_99	4	0.259	14	0.206	10	0.795	APGVB	0.266
2	Sri Visakha GB	4	0.256	15	0.200	11	0.782		0.216
3	Sangameswara GB	-3	0.269	3	0.310	6	1.149		0.328
4	Manjira GB	2	0.266	6	0.336	4	1.264		0.306

S No	Name of the RRB	RD	Incl IV_99	RK_99	IV_03	RK_03	PR	Name of the Merged Bank	INCL Trend_AVG (99-03)
5	Kakatiya GB	-1	0.265	7	0.259	8	0.980		0.305
6	Rayalaseema GB	-3	0.261	11	0.185	14	0.711	APGB	0.236
7	Sri Anantha GB	9	0.244	16	0.281	7	1.149		0.246
8	Pinakini GB	-11	0.269	4	0.079	15	0.294		0.242
9	Chaitanya GB	10	0.260	12	0.377	2	1.450	CGGB	0.337
10	Godavari GB	7	0.264	8	0.519	1	1.966		0.340
11	Sri Saraswathi GB	-3	0.259	13	-0.022	16	-0.083	TGB	0.039
12	ShriSaathavahana GB	-8	0.861	1	0.226	9	0.262		0.337
13	Golconda GB	-3	0.261	10	0.187	13	0.718		0.185
14	Srirama GB	-3	0.272	2	0.335	5	1.233		0.430
15	Kanakadurga GB	2	0.268	5	0.344	3	1.286	SGB	0.321
16	Sree Venkateswara GB	-3	0.261	9	0.193	12	0.737		0.229
	Mean	4	0.300		0.251				0.273



8. RESULTS

In the regard to our study objective ‘Impact of Amalgamation of RRBs on Financial Inclusion and Financial efficiency-we observe the following:

- As regards financial efficiency proxied by the composite CAMEL performance index scores in the pre-merger period; most of the RRBs showed distinctive but marginal improvement in financial indicators by 2003, but simultaneously showed a significant decline in their inclusion scores, both in relative and the absolute terms during the same period (1999-2003).
- This clearly illustrates that impact of prudential regulation did not significantly improve the lot of RRBs in regard to financial viability in terms of their CAMEL scores on the one hand, but certainly led to worsening of their absolute performances in regard to ‘Inclusion’ during the pre-merger period.
- On the Amalgamation of RRBs: Given the pre-merger status of RRBs in terms of the scores on CAMEL and Inclusion indices and of amalgamation that followed, one finds that the amalgamation process resulted largely in a concentration of weak banks (for e.g. APGVB, SGB and TGB) and strong banks in the others (viz. CGGB) (Table 5). This has since affected the turnaround of the RRBs in the post merger period rendering the amalgamation exercise a non-starter as regards financial efficiency. The impact on inclusion has been largely neutral in the post-merger period given that the trend average inclusion scores marginally improved from close to 0.3 to 0.4 during the post amalgamation period.

ANNEXURE 1: LIST OF VARIABLES FOR VARIOUS CAMEL-I INDICATORS¹⁴

I. Capital Adequacy (4 Indicators)		
1.	Coverage Ratio	Tot Liabilities / (Tot G Assets)
	This gives the share of liabilities of a firm as percentage of its Gross Assets	
2.	Debt to Equity Ratio (DER)	Long Term Debt / Equity
	DER provides an indication of credit risk given that higher leveraged firm is more vulnerable to external shocks	
3.	Equity Multiplier (EM)	Total G. Assets / Equity
4.	Capitalization Ratio	Equity / (Loans + Invests)
II. Asset Quality (5 Indicators)		
5.	Total Gross Advances to G. Assets Ratio	Total Gross Advances / Total Gross Assets
6.	Total NPA to Tot Assets Ratio	T. NPA / T. Gross Assets
7.	Gross NPA to Gross Advances	Gross NPA / Gross Advances
8.	ROA (in percent)	Gross Profit / Total Gross Assets
	-----where Gross Profit = Net Income	
9.	Total Gross Investments to Assets Ratio	Total Gross Investments / Gross Assets
III. Productivity or Management Efficiency (6 Indicators)		
10.	G. Profit Per Employee (GPE)	Total G.Profits or Net Income / Total Number of Employees
11.	Business Per Employee (BPE)	Total Business / Tot No Of Employees
12.	Business Per Branch (BPBr)	Total Business / Tot No Of Branches
	where Business = Total Deposits + Tot Advances	
13.	Wage to Total Expenses Ratio	Wages / Total Expenses
14.	Wage to Intermediation Costs or Total Costs	Wages / Total Costs
15.	Burden Efficiency Ratio (BER)	(Burden / Tot Income
	-- where Burden = (Non Interest Expense - Non Interest Income);	
	---where Total Income = Interest Income + Non Interest Income	
IV. EARNINGS (7 INDICATORS)		
16.	Operating Profit or Net Profit (in Rs.)	NII - T.Costs
17.	Operating Profit Margin (OPM) Percent	NII - T.Costs / G.Assets * 100
18.	Profitability Ratio	Spread Ratio - Burden Ratio
19.	Spread (Percent)	(Interest Earned - Interest Expense) / (Total Business) * 100
	-where Business = Total Deposits + Total Advances;	
	-where NII = Net Interest Income = Interest Income - Interest expense	
	-Spread Ratio = (NII) / (Total Business) * 100	
	and Burden Ratio = (Non Interest Income - Non Interest expense) / (Tot Business) * 100	
20.	RoE (percent)	(Gross Profit / Equity) * 100
	RoE indicates the extent to which the earnings are available to cover the losses.	
	Here Gross Profit or Net Income = Total Income - Total Expense	
21.	ROI (percent)	(Gross Profit / Total Investments) * 100
22.	Net Margin	¹⁵ Gross Margin - TCR - RCR

¹⁴ Source: Toor (2006), *Financial Sector Assessment: A Handbook (2006)*, et al.

¹⁵ Gross margin = (Financial Return (FR) + Miscellaneous Income) / Total Gross Assets (in percent);
Financial Return (FR) = Spread or Net Interest income / Total Gross Assets (in percent);

23.	Cost to Income Ratio (CIR) percent	(Op. Expenses / Total Income)*100
V. LIQUIDITY (3 INDICATORS)		
24.	Cash Ratio (percent)	CASH/ TOT ASSETS
25.	Liquid Assets Ratio (%)	¹⁶ LIQ ASSETs / TOT G.ASSETS
26.	Liquid Assets to Total Deposits Ratio (%)	LIQ ASSETs / TOT DEPOSITS
V. INCLUSION (13 INDICATORS)		
27.	Deposit Amount per Account (Rs. Lakh)	Total Deposits/Total Number of Accounts.
28.	Credit Amount per Account (Rs. Lakh)	Total Credits /Total Number of Accounts
29.	Credit to Deposit Ratio (CDR)	Total (Credit per branch/ Deposit per branch)
30.	Investment-Deposit Ratio (percent)	Total Investment per branch/ Total Deposit per branch
31.	Priority crop loans per a/c (Rs. Lakh)	Priority crop loans/ Total Number of Accounts
32.	Prior crop loan to Total Prior Adv (%)	Priority crop loans/ Total Prior Advances
33.	Prior Crop loan to Total Advance (%)	Priority crop loans/ Total Advances
34.	Prior Term Loans per Account Lakh	Prior Term Loans/ Total number of Accounts
35.	Prior Term Loans to Total Prior advances (%)	Prior Term Loans / Total Prior Advances
36.	Prior Term Loans to Total Advances (%)	Prior Term Loans / Total Advances
37.	Prior Amount per Account Rs. lakh	Prior Amount / Total number of Accounts
38.	Total Prior Advances-to-Tot Advances %	Prior Advances / Total Advances
39.	Total Advances to Total Liabilities_Ratio	Total Advances / Total liabilities

ANNEXURE 2: Post-Merger Year-wise Weighted CAMEL Score-(2006-2011)

S No	Name of the RRB	2006	2007	2008	2009	2010	2011	*CAMEL_TA
1	APGVB	0.231	0.260	0.357	0.371	0.564	0.270	0.342
2	APGB	0.499	0.494	0.542	0.373	0.530	0.164	0.434
3	CGGB	0.378	0.384	0.401	0.330	0.409	0.439	0.390
4	DGB	0.568	0.219	0.368	0.620	0.488	0.402	0.444
5	SGB	0.459	0.384	0.403	0.327	0.343	0.174	0.348
	Mean	0.427	0.348	0.414	0.404	0.467	0.290	

*CAMEL_TA is the trend average of the weighted CAMEL scores for a given RRB from 2006-2011. The last row gives the average CAMEL score across all RRBs for the given year

ANNEXURE 3: Post-Merger Year-wise Inclusion Score-(2006-2011)

S No	Name of the RRB	2006	2007	2008	2009	2010	2011	#Incl_TA
1	APGVB	0.258	0.259	0.329	0.323	0.373	0.158	0.283
2	APGB	0.470	0.406	0.559	0.576	0.578	0.477	0.511
3	CGGB	0.373	0.505	0.549	0.490	0.433	0.387	0.456
4	DGB	-0.032	0.082	0.086	0.091	0.076	0.326	0.105
5	SGB	0.428	0.355	0.419	0.368	0.369	0.719	0.443
	Mean	0.299	0.321	0.388	0.370	0.366	0.414	

Incl_TA is the trend average of the Inclusion scores for a given RRB from 2006-2011. The last row gives the average CAMEL score across all RRBs for the given year

Transaction Cost Ratio (TCR)=(Transaction Cost-Provisions)/Total Gross Assets (in percent);

Risk Cost Ratio (RCR) = (Provisions & Contingencies)/ Total Gross Assets (in percent)

¹⁶ Liquid Assets = ST Investments-Balances with RBI

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