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A STATISTICAL ANALYSIS OF BANKS IN ARMENIA

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Abstract

Financial data for banks operating in Armenia in 2001 were extracted from Arka News Agency publications which use the variable, Weight Share of Assets, to rank and classify the country's 31 banks. The present study employs statistical procedures, including Factor Analysis and Cluster Analysis, applied to a selected subset of banks, namely those for which complete data was available. One conclusion drawn from the study corroborates Arka's use of the Weight Share of Assets to classify banks. Further analysis determined various cutoff points for Weight Share values used to delineate bank peer groups. Peer grouping is an effective tool to perform comparative analyses among banks or other entities.

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INTRODUCTION - AN HISTORICAL FRAMEWORK

In the beginning of the 20th century capitalism emerged in Armenia. The Russian capital, Moscow, ruled over Armenia, and the major banks of Russia had established their branches in principal towns of Transcaucasia (Armenia, Georgia and Azerbaijan). About 10 banking institutions were operating in Yerevan in 1914. In October 26, 1920, the law established the State Bank of the Republic of Armenia on the basis of the Yerevan branch of the State Bank. After establishment of the Soviet regime in Armenia, the Revolutionary Committee and the People's Commissariat of Finance (PCF) issued a decree on December 10, 1920, to nationalize the private banks and withdraw the currency then in circulation. In 1921 the State Bank of USSR was established, with the main office and branches created in Armenia in 1924. In 1925 the Yerevan office of the State Bank of the USSR was renamed into the Armenian office of the State Bank of the USSR (CBA, 2002).

In the late 80's, there were 52 branches of the Republican Office of the State Bank of the USSR in Armenia in 1987. Haik was the first cooperative bank established in Soviet Armenia October 6, 1988, which put basis and gave rise to a broad network of banks in the republic. In December 1988, Erevan Bank was the first among commercial banks established. Armeconombank was the first bank established immediately after the independence of the Republic of Armenia was obtained on September 26, 1991 (CBA, Banking System of Armenia; 1999, P. 11). In December 1991, the State Bank of the SSRA was charged with responsibility as a National Bank of the newly independent Armenian Republic. The Armenian Law on The Central Bank of the Republic of Armenia adopted in March 27, 1993, renamed the National Bank into the Central Bank of Armenia (CBA) (CBA, 2002).

Banks and financial institutions mushroomed rapidly during Armenia's early years of independence, but faced a number of serious problems in the years 1994 and 1995, when a banking system crises forced 37 banks to cease their activities. At the end of 1995, only 34 banks were operating in Armenia (Synthesis, 2001, p. 74). The new minimum capital requirements had forced the closure of almost half of Armenia's banks (Lafferty, 1995).

As of 1995 the CBA's organizational structure has been based on experiences of European and international financial institutions adapted to take into consideration local characteristics (Asatrian, 1995, p. 60). The Association of Banks of Armenia was founded on July 27, 1995, and Tigran Sargsyan was elected as President. On June 31, 1996, the National Assembly adopted Armenian laws on banking designed to regulate the banking system (CBA, 2002). As of January 1, 1996, 38 banking institutions operated in the ROA, including 3 branches of non-resident banks. During the same year, 8 of these institutions terminated their activities - two of them through self-liquidation, while the banking licenses of the other six banks were revoked by the CBA (Asatrian, 1996, p. 39).

As of January 1, 1997, there were 33 banking institutions and one non-resident bank branch operating in Armenia. One year later, only 30 banks with 174 branches were registered in the country (CBA, Banking System of Armenia; 1999, P. 11). Mainly due to tightening of normative requirements by the CBA to increase the minimum total capital, during 1997 total assets of the

banking system grew by 57.6% (as the number of banks decreased); the magnitude of actually-completed share capital of the banking system increased by 60.6%. (Sargsyan, 1997, pp. 54-55). The year 1998 heralded the installation of Tigran Sargsyan as chair of the CBA (CBA, 2002) and stabilization of the banking system of Armenia due to improvements of the regulatory field and introduction of international accounting standards (CBA, 1998, p. 35). As of January 1, 1999, 18 of 31 banks operating in Armenia were registered as Closed Joint-Stock companies, 5 Public Joint-Stock Companies, 7 Limited Liability Companies and 1 Cooperative Bank (CBA, Banking System of Armenia; 1999, P. 11).

The banking situation remained more or less stable until mid-2000 when another wave of asset mismanagement and minimum capital under-performance was observed. During 2000 and at the beginning of 2001 the CBA undertook various types of insolvency procedures against the 5 worst-performing commercial banks. At the beginning of 2001, the license of Econominvestbank was revoked because of minimum capital requirement violations. As of March 31, 2001, 30 banks with 218 branches were registered in Armenia, but only 26 of them were totally operating, out of which 4 were subsidiaries of foreign banks: HSBC-Armenia, Areximbank, Mellatbank, and International Commercial Bank-Armenia. Regarding ownership, 15 banks were closed joint-stock companies (one, Armsavingsbank, being state-owned), 6 were open joint-stock companies, 4 were limited liability companies and one was a co-operative (Synthesis, 2001, pp. 74-75).

DATA DISCUSSION

All data employed in the present study are obtained from Arka News Agency publications. Special issue *Main indicators of Banks of Armenia* (Arka, 2001) is published by Arka News Agency on the basis of consolidated balances and other financial accounts published in press which reflect activity of banks in Armenia. The present study extracted 13 financial variables (see Table 2) from Arka's March 31, 2001 publication. All other variables featured in the Arka document are functions of one or more of the 13 variables, for example, 'Demand Liabilities per Total Liabilities', and are thus omitted. Of the 31 banks reported in operation by Arka as of its March 31, 2001 and presented in the Arka report, a sample of 17 banks was extracted and included in this study, each bank corresponding, respectively, to one of the 13 aforementioned variables. Data used in the present analysis and their corresponding standardized scores are presented in Appendix Table A1 and Appendix Table A2, respectively. The remaining 14 banks, either had no data or had incomplete data. If the exclusion of these banks could be viewed as random events, then the findings from the 17-bank study would probably apply to these banks.

Arka's bank data is reported without assignment of subjective commentary or recommendation about the banks, or claims as to the explanatory powers of the banking variables. The present study selects the 13 variables as potentially explanatory or causal, although possibly un-correlated, or correlated but not causal, i.e., associative. In the event that any of the 13 variables proves not useful in explaining variances among groups of banks, it will be ignored in the statistical analysis and will not interfere with the study. Thus, the intent was to include as many variables as practicable from Arka data, in this case 13, in order to avoid the possibility of omitting an important yet seemingly unrelated variable at the outset.

As of the 3rd quarter of 2002, Arka's Armenia bank data reports are referred to as *Activity* rather than *Main* indicators of Banks in Armenia. Three Peer Groups are delineated depending on Bank Asset Volume, the middle peer group defined as ranging between 5 and 10 Billion AMD. Also unlike previous issues, Armenia's banks are divided into two groups, namely 'banks operating in a common normative framework' and 'banks under trusteeship and temporary administration.' Incorporating this into the study would mean inclusion of a binary *variable*, which, in effect, would transform the study into two studies, one for each administrative framework. This would not be problematic if the original sample size was large enough such that, after bifurcation, either sub-sample retained sufficient number of observations. Because, however, as in the present case, we have a very small sample size, 17, relative to the number of variables, 13, adding a binary variable will cause the sample size to be so small that any analytical results would not be as reliable.

All references to currency in the present study will preserve data in local currency, the Armenian Dram (AMD), unless otherwise indicated. The CBA issues the AMD, which traded per USD at 544.68 on March 31, 2001 (coincident with Arka's publication date), and at 582.00 on January 22, 2003 (CBA, 2003).

BANK PEER GROUPING

The differentiation of Armenian banks by Arka into three groups was realized for specifying their position in peer groups and calculation of peer group ratio averages. Acknowledged by Arka, classification of banks by assets size - large (Group I), medium (Group II), and small (Group III) bears conditional character, does not speak to the efficiency of bank activity, and may disagree with classifications of other organizations and agencies. The criterion for banks classification by *asset size* considers, more specifically, relations of average assets of banks to average assets of banking system for periods reported June 30, 2000 to March 31, 2001. As such, Arka's Peer Groups I, II and III are defined by Weight Share of Assets, respectively, *greater than 5%*, *from 1% to 5%*, and *less than 1%* (Arka, 2001). Cluster Analysis could plausibly yield similar demarcations, but generally classification will not be based on one variable alone. The present study, which considers a subset (17) of the 31 banks reflected in Arka data, employs Factor Analysis and Cluster Analysis, which result in the determination of bank peer group cutoff points, as well as the identification of the most salient variable affecting the demarcation process.

FACTOR ANALYSIS

Factor Analysis was performed on a 17 by 13 matrix, corresponding to the 17 banks and 13 financial banking variables (see Table 2) which, in effect, relate to 13 corresponding *traits* identified with banks in Armenia. An 'n x m' matrix may be thought of as *n* vectors in an *m*-dimensional space or as *m* vectors in an *n*-dimensional space. One goal of Factor Analysis is to

reduce the dimensionality of the vector space and reduce the number of dimensions required to represent a set of variables.

Given 13 variables, factor analysis yields 13 factors that will each be a product conversion of *all* 13 variables, and that will explain *all* the variance in the data. However, generally only a few of these generated factors will explain *most* of the variance and, as such, the remaining factors may be, and are in this study, neglected without much loss of accuracy.

These factors may be given appropriate names, based on the variables they highly correlate with, (+ or -), whereas other times there may not be a pre-defined name assigned, in which case the factors are simply labeled as, for example, factor 1, factor 2, etc. Alternatively, the researcher can interpret the factors and what they stand for and, as such, even make up names for them. In this study, no attempt was made to name the factors, based on their association with the variables.

Factor Analysis isolates the particular relationship in a set of data, which is taken from the usual condition that many variables vary concurrently. It groups variables together and delineates the underlying constructs, with their elements generating the factors which may be responsible for said groupings. Factor Analysis might, therefore, be thought of as performing variable synthesis, producing new entities, which could be considered new variables for both analyses and groupings. As such, a factor is a linear compound of variables, so weighted, and referred to as factor loading, as to best explain the variance in the correlation and constitutes the correlation of a variable with a factor.

The factors are extracted using many methods - most often the Principal-Factor Analysis, the principal-factors being the Eigenvectors. There is also a method, Principal-Component Analysis, applied to the variance-covariance matrix rather than the correlation matrix. In this sense, Principal-Factor Analysis is a special case of Principal-Component Analysis, namely, Principal-Component Analysis applied to the standardized variables.

In our study, the results of Factor Analysis reveal that only a few of the 13 variables enter the generated factors with a high correlation (+ or -) as evidenced in Table 1, Total Variance Explained, which shows the amount each factor (component) contributes to explain the variance. The statistical procedure's first factor always explains more of the variance than the second factor, and the second factor more than the third, etc. Specifically, Table 1 shows that the first factor explains 70.319% of the variance, and that the first two factors combined explain 88.755% of the variance. With inclusion of the successive 3 factors, approximately 99%, (98.975%) of the variance is explained. The remaining 8 factors in entirety explain only approximately 1% of the variance.
Only factors 1 and 2 have Eigenvalues equal to or greater than 1. This indicates that for each of the subsequent 11 factors, the variable itself is more effective in explaining the variance than the component (factor), as the variables are standardized and thus the variance of each variable is 1, with a total variance of 13, for all the 13 variables combined. The statistical software by default ignores such factors, and accordingly, cells associated with these components, are left blank in Table 1.

Table 1. Total Variance Explained

(Factor) Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.141	70.319	70.319	9.141	70.319	70.319	6.343	48.796	48.796
2	2.397	18.436	88.755	2.397	18.436	88.755	5.195	39.959	88.755
3	.648	4.988	93.743	-	-	-	-	-	-
4	.394	3.028	96.771	-	-	-	-	-	-
5	.286	2.204	98.975	-	-	-	-	-	-
6	6.410E-02	.493	99.468	-	-	-	-	-	-
7	3.589E-02	.276	99.744	-	-	-	-	-	-
8	2.781E-02	.214	99.958	-	-	-	-	-	-
9	3.940E-03	3.030E-02	99.988	-	-	-	-	-	-
10	1.516E-03	1.166E-02	100.000	-	-	-	-	-	-
11	1.680E-05	1.292E-04	100.000	-	-	-	-	-	-
12	1.947E-17	1.498E-16	100.000	-	-	-	-	-	-
13	-1.676E-16	-1.289E-15	100.000	-	-	-	-	-	-

Extraction Method: Principal Component Analysis (Factor Analysis).

The Factor Analysis output in tabular form found in Table 1is reformatted in graphical form using the displayed Scree Plot.

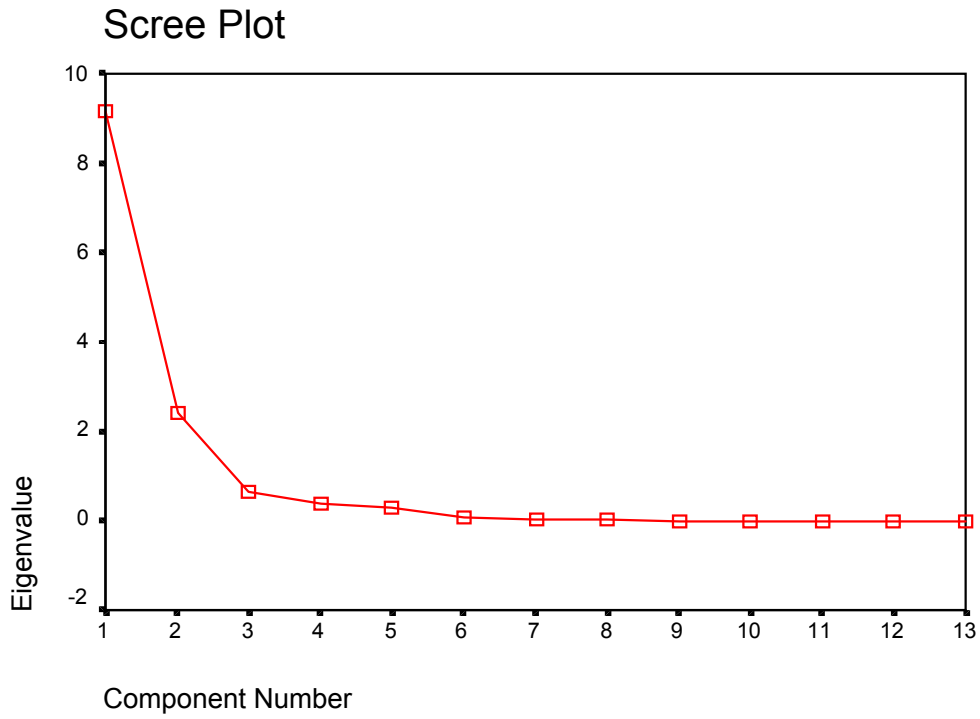

Table 2 presents the result of Factor Analyses. The first 8 or 9 variables show high correlation with, or loading on, component 1. The remaining 5 or 4 variables have a moderate correlation with, or loading on, component 1. The first 3 variables, on the other hand, have near zero correlation with, or loading on, component 2. The other variables have moderate or low correlation with, or loading on, component 2 (a negative sign indicates an inverse correlation).

Table 2. Component Matrices & Factor Scores

m= 1-13	Financial Data Variable Name (From Arka)	Variable Name	2-Component Outcomes					
			UN-ROTATED Zscore		**ROTATED Zscore**		**Factor Score Coefficients**	
			1	2	1	2	1	2
1	Total Assets	TTL.ASST	.993	4.209E-01	.732	.672	.093	.058
2	Average Assets	AVG.ASST	.991	-3.728E-02	.782	.610	.072	.083
3	Total Liabilities	TTL.LIAB	.990	9.785E-03	.751	.645	.080	.073
4	Loan Investments	LN.INVST	.928	-.315	.913	.357	.162	-.035
5	Total Capital	TTL.CAP	.911	.330	.484	.839	-.012	.169
6	Time Deposits of Physical Entities	TD.PH	.902	-.231	.839	.404	.138	-.010
7	Total Time Deposits of Physical & Legal Entities	TD.PHLGL	.873	-.364	.903	.284	.171	-.055
8	Time Liabilities	TM.LIAB	.842	-.510	.972	.152	.207	-.103
9	Demand Liabilities	DMD.LIAB	.784	.575	.229	.945	-.089	.239
10	Statutory Fund	STAT.FND	.625	.301	.284	.633	-.029	.140
11	Securities	SECURIT	.618	.555	.116	.822	-.097	.221
12	Loans to Economy	LN.ECON	.667	-.723	.976	-.123	.250	-.184
13	Interbank Loans	INTBK.LN	.619	.699	----	.934	-.136	.267

Extraction Method: Principal Component Analysis. A 2-component outcome extracted.
Rotation Method: Varimax with Kaiser Normalization. A rotation converged in 3 iterations.

Once the factors and the factor loadings are defined, the coordinate system (the factors) may be rotated, such that those factor loadings (un-rotated) in Table 2 which are small, but not small enough to be neglected, are converted to values either large enough to keep or small enough to neglect. Rotation changes the factor loadings but they remain identical mathematically and explain the same amount of variance in each variable and thus in the entire matrix. The rotated component matrix demonstrates that correlation values, overall, are significantly strengthened relative to the original (un-rotated) manifestation. Both un-rotated and rotated cases are presented in Table 2.

The factors obtained from Factor Analysis may be interpreted as latent, fundamental, underlying variables, which explain the variance in bank data. In this study we can relate the banks to these factors, allowing us to ascribe a given bank with so much of factor 1, so much of factor 2, etc., which are referred to as a Factor Score.

The last 2 columns of Table 2 show Factor Score coefficients for the two factors referred to as component 1 and component 2 for each of the 13 variables. Total Factor Scores for component 1 (Equation 1) and for component 2 (Equation 2) would be, respectively:

(Eq. 1) f1 = .093 (zttl.asst) + .072 (zavg.asst) … -.089 (zdmd.liab) -.029 (zstat.fnd) ... -.136 (zintbk.ln), and

(Eq. 2) f2 = .058 (zttl.asst) +.083 (zavg.asst) … +.239 (zdmd.liab) + .140 (zstat.fnd) … + .267 (zintbk.ln),

where the variable names represent their respective standardized values.

CLUSTER ANALYSIS

The goal of Cluster Analysis is to group cases together to form clusters which are relatively homogeneous within each cluster *and* relatively distinct from one another. To define homogeneous and distinct, the concept of *distance* is utilized. Homogeneous cases are similar cases and are associated with short distances, while distinct clusters are dissimilar and are associated with long distances.

There are several measures of distance that can be used to depict the dissimilarity of two cases. The more common ones being the Euclidean distance, the square root of the sum squared differences in values of each variable for the two cases; the Squared Euclidean distance, the sum squared differences in values of each variable for the two cases; and City-Block or Manhattan distance, the sum of the absolute differences in values of each variable for the two cases. There are other distance measures as well.

Cluster Analysis starts by assigning all cases to a single cluster. Then it will pick the case which is *farthest* and assign it to a new cluster. It will then again pick the next farthest case and either adds it to the previous cluster or assign it to a 3rd cluster. The procedure continues in this manner until every case is in a cluster by itself. Alternatively, it may assign each case to a cluster on its own and then merge the clusters to each other until all clusters are merged and one cluster is formed.

In our study, several clustering methods and various options and measures of distance were utilized to group the banks into 2, 3, 4, and 5 clusters. Table 3 summarizes the SPSS output, which features Armenia's banks listed in descending order by Weight Share of Assets (Table 3, column 2).

Table 3. Cluster Analysis Output Matrix

BANK NAME (n=17)	Weight Share (%) (per Arka)	PEER GROUP (per Arka)	K-Mean Clustering (No. of Clusters)			Hierarchical Clustering (No. of Clusters)			5-Cluster Cases		
									K-Mean		Hier-arch-ical
			2	**3**	**4**	**2**	**3**	**4**	**a**	**b**	
HSBC Bank	12.75	1	2	3	4	2	3	4	4	4	5
Armimpexbank	9.99	1	2	2	2	2	2	2	2	2	2
Ardshinbank	8.64	1	2	2	2	2	2	2	2	2	2
Credit-Yerevan	8.34	1	2	2	2	2	2	2	2	2	2
Converse Bank	6.79	1	2	2	3	1	1	3	5	5	4
Armagrobank	4.77	2	1	1	3	1	1	3	5	5	3
Armenian Development Bank	4.72	2	1	1	3	1	1	3	5	5	3
Armeconombank	3.69	2	1	1	3	1	1	3	3	3	3
Mellat Bank	3.04	2	1	1	1	1	1	1	3	3	1
Arminvestbank	2.09	2	1	1	1	1	1	1	3	1	1
Credit-Service Bank	1.46	2	1	1	1	1	1	1	1	1	1
Artsakhbank	1.42	2	1	1	1	1	1	1	1	1	1
Areximbank	1.40	2	1	1	1	1	1	1	1	1	1
Inecobank	1.11	2	1	1	1	1	1	1	1	1	1
Internat. Com. Bank	0.79	3	1	1	1	1	1	1	1	1	1
Adana Bank	0.64	3	1	1	1	1	1	1	1	1	1
International Investment Bank	0.42	3	1	1	1	1	1	1	1	1	1

CLUSTER ANALYSIS OUTCOMES

Interestingly, clustering results are strongly consistent with that of Arka in terms of its implementation of Assets as the most effective variable in classifying banks. Hence, using the Weight Share (%) as a grouping variable has proven statistical merits. Given results of all Cluster Analyses performed, the cutoff points would be as shown in Table 3.

Another interesting point is that for the 3-Cluster case (more comprehensively, for all but the 2-cluster cases), HSBC Bank-Armenia, enters into a group of its own, at a cutoff point between 9.99% and 12.75%. For all the clustering cases except K-Mean 2 and K-Mean 3 cases, the cutoff point is between 6.79% and 8.34%. For K-Mean 4 and Hierarchical 4-Cluster cases (as well as for other 4-Clustering procedures not presented), cutoff points are consistently established between the following sets of values: 3.04% and 3.69%; 6.79% and 8.34%; and 9.99% and 12.75%.

Common across all 5-Cluster Cases are the two upper-end cutoff points, between 9.99% and 12.75% and between 6.79% and 8.34%. From there, however, cutoff points become dissimilar, exemplified at the lower end: between 1.46% and 2.09% (K-Mean-a Cluster Case), between 2.09% and 3.04% (K-Mean-b Cluster Case), and between 3.04% and 3.69% (Hierarchical Case). Three institutions, Mellat Bank, Arminwestbank and Credit-Service Bank, lie within this array of cutoff points and, hence, could be associated with one group or another depending on the clustering assumption.

As clustering dimensions increase (6-Cluster procedures were performed but not shown), the condition is further exacerbated and, accordingly, noise in the data within a group becomes

significant compared with the differences between the groups. In such cases, very minor fluctuation in the data is sufficient to shift a given institution from one peer group to another.

MANAGERIAL IMPLICATIONS

Banking consolidation, mergers, insolvencies, liquidations, charter conversions, restructuring and other machinations adversely affect the financial manager's ability to analyze bank performance across strictly defined peer groups. Armenia's banking environment, for example, which had experienced a semblance of stability circa mid-2000, subsequently thereafter suffered a wave of asset mismanagement and minimum capital under-performance. Consequently, the CBA executed insolvency procedures against the country's 5 worst-performing commercial banks (Synthesis, 2001, pp. 74-75). Notwithstanding institutional volatilities, the financial manager derives merit from segregating entities into groups (in this study accomplished by employing cluster analysis). The manager's expectation is that, again citing our banking case, if a bank in one peer group performs well, chances are all other banks in the same group should perform equally as well. (*Doing well* was quantified in this study using factor analysis.) Hence, the peer group becomes an important benchmarking tool for the financial manager.

Managerial decisions are routinely executed on the basis of institutional (or divisions thereof) performance. Hence, it is imperative that managers judge an entity's performance within the context if its apposite peer group. This, accordingly, necessitates careful specification of both the salient variable(s) - in our case, Assets - and the variable's ranges, in order to appropriately demarcate discrete peer groups within a given population. A United States Federal Reserve Bank Peer Performance study (Federal Reserve, 2002) also selected Assets as its discriminating variable. The Fed's 6 peer groups were established based on the following 5 ascending-order Asset value demarcations (in USD): 25million, 100million, 300million, 1billion, and 5billion. Indeed, managerial decision-making with regard to a given financial institution essentially necessitates the establishment of a construct conducive to fair comparative analyses, which peer-based modeling affords to a large degree.

SUMMARY

Factor Analysis and Cluster Analysis allow us to draw two conclusions with respect to Armenia's Banks. Among 13 financial variables considered, Bank Assets, measured in Weight Share (%), is found to be the principal variable in explaining variation among the 17 banks sampled in the study. This finding is strongly consistent with Arka's peer-grouping practice. The present study's Cluster Analysis establishes cutoff points and methodically delineates peer groupings in order to render an efficacious milieu for comparative analyses of banking institutions in Armenia.

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APPENDIX

Appendix Table A1. Data per Arka used in Present Analysis.

BANKNAME	AVG.ASST	TTL.ASST	TTL.CAP	STAT.FND	TTL.LIAB	LN.INVST
Adana Bank	1,479,050	1,770,570	557,172	539,537	1,213,398	615,349
Ardshinbank	20,105,571	21,997,495	1,746,691	800,000	20,250,804	13,480,079
Areximbank	3,266,104	4,178,315	649,906	663,327	3,528,409	888,021
Armagrobank	11,097,400	11,257,814	1,300,430	1,239,776	9,957,384	6,144,986
Armeconombank	8,586,753	9,199,386	1,134,536	1,100,000	8,064,850	4,079,566
Armenian Development Bank	10,986,603	12,017,263	1,497,037	1,077,001	10,520,226	4,719,361
Armimpexbank	23,246,610	21,006,023	2,363,645	2,028,408	18,642,378	14,849,242
Arminvestbank	4,868,846	4,537,749	718,690	630,500	3,819,059	2,913,352
Artsahkbank	3,307,105	3,313,335	1,045,835	682,050	2,267,500	1,795,025
Converse Bank	15,797,971	15,375,568	1,247,767	129,966	14,127,801	10,003,522
Credit-Service Bank	3,399,253	3,586,194	752,947	525,400	2,833,247	2,146,070
Credit-Yerevan Bank	19,404,177	18,439,635	1,962,375	1,842,762	16,477,260	10,793,296
HSBC Bank-Armeni	29,658,313	33,127,230	4,200,515	2,437,600	28,926,715	11,917,567
Inecobank	2,589,476	2,499,145	717,452	304,733	1,781,693	1,875,895
Intern. Com. Bank (Armenia)	1,848,150	2,233,315	1,457,819	2,153,770	775,496	704,190
International Investment Bank	969,459	1,031,229	389,621	500,000	641,608	582,839
Mellat Bank	7,080,160	6,520,829	680,344	1,424,012	5,840,485	2,652,020

Appendix Table A1 Continued.

BANKNAME	LN.ECON	INTBK.LN	SECURIT	DMD.LIAB	TM.LIAB	TD.PHLGL	TD.PH
Adana Bank	184,307	431,042	74,400	266,054	942,312	343,164	234,253
Ardshinbank	13,200,658	279,421	481,500	5,072,283	14,734,122	11,142,126	6,766,717
Areximbank	884,770	3,251	570,894	2,166,438	1,337,564	1,255,862	487,997
Armagrobank	5,639,169	505,817	355,785	1,285,024	8,208,567	7,190,895	2,169,273
Armeconombank	3,820,843	258,723	1,693,725	2,693,191	5,157,014	4,531,435	3,852,882
Armenian Development Bank	4,281,438	437,923	3,381,345	3,324,719	6,948,095	4,224,598	2,554,199
Armimpexbank	14,554,370	294,872	1,212,748	3,143,308	15,136,387	7,196,675	4,117,915
Arminvestbank	2,913,352	0	204,784	1,145,718	2,581,893	1,409,554	789,293
Artsahkbank	1,269,798	525,227	617,420	913,915	1,223,678	1,223,678	1,155,744
Converse Bank	6,790,924	3,212,598	823,644	2,553,061	11,095,605	3,405,572	1,880,616
Credit-Service Bank	2,143,070	3,000	616,865	411,643	2,210,135	1,318,722	435,108
Credit-Yerevan Bank	10,278,448	514,848	670,907	3,521,471	12,659,045	11,731,246	7,008,210
HSBC Bank-Armeni	1,749,663	10,167,904	3,728,007	20,808,067	7,904,248	7,894,426	5,725,585
Inecobank	1,870,895	5,000	203,135	0	1,716,169	1,187,788	714,644
Intern. Com. Bank (Armenia)	252,106	452,084	585,184	255,855	500,445	228,105	225,405
International Investment Bank	582,839	0	294	0	629,460	304,141	79,478
Mellat Bank	337,130	2,314,890	701,184	3,098,482	2,496,045	2,496,045	1,714,179

Appendix Table A2. Standardized Scores of Table A1.

BANKNAME	ZAVG.ASS	ZTTL.ASS	ZTTL.CAP	ZSTAT.FN	ZTTL.LIA	ZLN.INVS
Adana Bank	-0.95478	-0.91524	-0.82940	-0.75676	-0.91437	-0.95181
Ardshinbank	1.16614	1.30118	0.46565	-0.38054	1.37888	1.66001
Areximbank	-0.75130	-0.65140	-0.72844	-0.57795	-0.63550	-0.89645
Armagrobank	0.14042	0.12435	-0.02020	0.25467	0.13893	0.17083
Armeconombank	-0.14545	-0.10121	-0.20082	0.05278	-0.08904	-0.24850
Armenian Development Bank	0.12781	0.20757	0.19385	0.01956	0.20673	-0.11860
Armimpexbank	1.52380	1.19253	1.13734	1.39377	1.18513	1.93798
Arminvestbank	-0.56880	-0.61202	-0.65355	-0.62537	-0.60049	-0.48526
Artsahkbank	-0.74663	-0.74619	-0.29739	-0.55091	-0.78739	-0.71231
Converse Bank	0.67566	0.57556	-0.07754	-1.34834	0.64130	0.95419
Credit-Service Bank	-0.73613	-0.71629	-0.61626	-0.77718	-0.71924	-0.64104
Credit-Yerevan Bank	1.08628	0.91132	0.70047	1.12562	0.92432	1.11454
HSBC Bank-Armeni	2.25388	2.52075	3.13717	1.98481	2.42398	1.34279
Inecobank	-0.82834	-0.83540	-0.65490	-1.09591	-0.84591	-0.69589
Intern. Com. Bank (Armenia)	-0.91275	-0.86453	0.15115	1.57484	-0.96712	-0.93377
International Investment Bank	-1.01280	-0.99625	-1.01182	-0.81386	-0.98324	-0.95841
Mellat Bank	-0.31700	-0.39472	-0.69530	0.52078	-0.35699	-0.53832

Appendix Table A2 Continued.

BANKNAME	ZLN.ECON	ZINTBK.L	ZSECURIT	ZDMD.LIA	ZTM.LIAB	ZTD.PHLG	ZTD.PH
Adana Bank	-0.87494	-0.28633	-0.80714	-0.56190	-0.90845	-0.95538	-0.90897
Ardshinbank	1.98817	-0.34743	-0.42603	0.43320	1.77205	1.90814	1.90053
Areximbank	-0.72086	-0.45873	-0.34234	-0.16843	-0.83163	-0.71337	-0.79984
Armagrobank	0.32492	-0.25620	-0.54372	-0.35092	0.50378	0.86041	-0.07675
Armeconombank	-0.07504	-0.35577	0.70882	-0.05937	-0.08931	0.15521	0.64734
Armenian Development Bank	0.02627	-0.28356	2.28871	0.07138	0.25880	0.07384	0.08880
Armimpexbank	2.28593	-0.34121	0.25854	0.03382	1.85023	0.86194	0.76132
Arminvestbank	-0.27465	-0.46004	-0.68508	-0.37977	-0.58979	-0.67261	-0.67026
Artsahkbank	-0.63617	-0.24838	-0.29878	-0.42776	-0.85377	-0.72190	-0.51266
Converse Bank	0.57827	0.83460	-0.10572	-0.08839	1.06489	-0.14333	-0.20090
Credit-Service Bank	-0.44409	-0.45883	-0.29930	-0.53175	-0.66205	-0.69670	-0.82259
Credit-Yerevan Bank	1.34539	-0.25256	-0.24871	0.11212	1.36875	2.06435	2.00439
HSBC Bank-Armeni	-0.53062	3.63751	2.61324	3.69120	0.44463	1.04696	1.45276
Inecobank	-0.50395	-0.45802	-0.68662	-0.61698	-0.75805	-0.73142	-0.70237
Intern. Com. Bank (Armenia)	-0.86003	-0.27785	-0.32896	-0.56401	-0.99433	-0.98589	-0.91278
International Investment Bank	-0.78728	-0.46004	-0.87652	-0.61698	-0.96926	-0.96573	-0.97554
Mellat Bank	-0.84132	0.47284	-0.22037	0.02454	-0.60648	-0.38451	-0.27248