International Journal of African and Asian Studies
ISSN 2409-6938 An International Peer-reviewed Journal
Vol.10, 2015

Modeling and Analysis of Ethiopian Banking Sector Performance using BSC and AHP Approaches

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Abstract
We live in a world of information superhighway where the physical world is frequently transforming into a virtual one and so is banking service. More often than not the banking business has replaced physical transaction and paper money with an online transaction and virtual money, leading to a cashless society. However, the same can't be said about the Ethiopian banking sector as much of the aforementioned features represent its tomorrow; today the sector is faced with an urgent matter of attaining excellence in conventional banking service. Hence, the purpose of this study was to determine the performance of banking service in Ethiopia using the BSC and the AHP approaches considered arguably, more reliable measure as compared to conventional ratio analysis and the results indicated that CBE ranked first with the score of 34.47%, followed by AIB (19.82%) which performed slightly better than DB (19.49%) and standing fourth is OIB (14.87%) and occupying the last position was AdIB (11.36%) in terms of performance as rated by experts in contrast based on conventional ratio analysis AdIB stood first with a score of 78% followed by OIB at 63%, then AIB (58%) and the fourth place belonged to CBE (51%) and finally DB (50%). Thus, the most vital variable missing in financial ratio analysis were perhaps customers; not to mention the internal business processes and the learning and growth perspectives of the banking service. Consequently, in order to secure a fuller understanding of actual banking service performance a combination BSC and AHP was suggested.

INTRODUCTION

The financial crisis from 2007 through to 2009 is amid the worst the financial sector has suffered since the great depression of the 1930s (Vyas, 2011). These were times that had shaded a dark light on the credibility of the financial world: particularly the banking sector. Five years on from the crisis some scholars argue that the crisis is far from over, though it's hard to ignore that the world is in a great revival mode. However, it's important to know that their concerns aren't hastily framed but rather on the experiences of yesterday which illusively look to have vanished. However, the financial sector is still in jeopardy as a slight misjudgment in regulations or a dark spot in the decree of financial practice can trigger yet another upset (Watkins, 2014).

A typical instance of such concern is the great depression itself which was lit by the failure of the Russians to pay their debts to the U.S. This situation has led to the credit crunch which delivered the U.S. unable to lend money and/or pay its obligations when they were due. The aggregate effect of the financial turmoil was soon felt by the U.S. economy or better yet by the international market. More simply, it has led to the meltdown of the global economic system; stated in the words of financial experts. Hence, a slip in one part of the world economy or lack of tighter regulations to enforce fair business practice may lead to yet another chaos (Fahlenbrach, Prilmeier & Stulz, 2012).

Conceivably, the 2008 financial crisis has made its mark sending the American banking giant Leman Brothers down to its grave. Even though the media kept warning the community, the world didn't see it coming nor did finance professionals to make matters even worse; little they knew Leman Brothers was only the beginning of the pandemonium. Soon the banking industry in the U.S. was brought to its knees forcing the government to use the tax payers' money to bail them out as an austerity measure to save the industry. However, this pandemic was not limited to the U.S. economy, but rather spread rapidly to Europe and Asia and the financial world was soon at the mercy of politicians and economic experts (Fernando, May & Megginson, 2012).

However, this wasn't the story in Ethiopia as the banking sector in the country remains closed to foreign participants (Kiyota, Peitsch & Stern, 2007); as the incumbent government has strict policies regarding the investment and practice of banking business in the country. To further elucidate, the government has explicitly enacted laws that forbid the entry of foreign banks and investment or ownership of local banks by foreign investors (Tilahun, et, al, 2012).

Currently the Ethiopian banking sector is one of the under-developed even compared to sub-Saharan Africa (SSA) (Kapur & Abebaw, 2012), however, the pressure exerted by customers in demand of quality banking service, the need to increase access and the number of new entrants to the sector is forcing the banks to transform dramatically. Nevertheless, in the fight to stay abreast of the market there are losers and winners. Winners who have invested wisely measured with comprehensive instruments that incorporating both financial and non-financial aspect of organizational performance. Hence, identifying winners and losers calls for a scientific inquiry.

MATERIALS AND METHODS

The study has used the Delphi method and philosophically the Delphi methodology is understood as an inquiry system and behind this methodology lays the western philosophy. Different western philosophers have proposed different ways of arriving at the truth. However, the Lockean system of inquiry is believed to be the basis for Delphi technique as we know it today. Lock stated that truth is experientially or empirically measured through its content. Further, explains that measuring the content depends on our ability to reduce it to a simple observation which is validated through consensus or agreement (Turoff & Linstone, 2002).

Historically, the Delphi technique can be traced back to the 1950s:

> *"The Delphi concept may be viewed as one of the spinoffs of defense research."Project Delphi" was the name given to an Air Force-sponsored Rand Corporation study, starting in the early 1950's, concerning the use of expert opinion. The objective of the original study was to "obtain the most reliable consensus of opinion of a group of experts ... by a series of intensive questionnaires interspersed with controlled opinion feedback."p.10 (*Ibid).

Since, then the Delphi method has found a wider applications in marketing decisions (e.g. Best, 1974; Brüggen & Willems, 2009), strategic management (e.g. Pina, Torres & Yetano, 2011), manpower or human resource forecasting (e.g. Milkovich, Annoni & Mahoney, 1972), nursing (e.g. Powell, 2003), finance (e.g. Peng, Groenewold, Fan & Li, 2014; Singh & Schmidgall, 2004), information technology (e.g. Yung. Zeng & Zhang, 2012; Khayun, Ractham & Firpo, 2012), medicine (Blavin & Buntin, 2013), engineering (Hallowell & Gambatese, 2010), organizational development (e.g. Korten, Caluwe & Geurts, 2010), risk analysis (e.g. Elmer, Seifert, Kreibich & Thieken, 2010; Herrmann, 2013), counseling/consulting (e.g. Heath, Neimeyer, & Pedersen, 1988; Rupprecht, Birner, Gruber & Mulder, 2011), quality management (Saizarbitoria, 2006) and supply chain management (Melnyka, Lummusb, Vokurkac, Burnsa & Sandora, 2009).

Though not explicitly stated, forgoing applications had involved multi-criteria decision making. Moreover, authors like Chan, Yung, Lam, Tam & Cheung, (2001) and Kang (2011) practically demonstrate the use of the Delphi method. Thus, leading to the conclusion that Delphi is a compatible device to be used with AHP, which is the tool used to analyze the data gathered through expert rating. Further, Skulmoski, Hartman and Krahn (2007) expound that Delphi technique can follow a three round or a two round or single round system adopting a questionnaire or survey or perhaps an interview for data collection purposes. Thus a singled round Delphi adopting a questionnaire was used.

Although, the foregoing discussions explain what Delphi is and how it came to be, they don't describe the benefits associated with using it. According to Gray & Hovav (2008) Delphi method has the ability to bring group of knowledgeable individuals together. Second, by using direct questions it helps experts focus on a problem, third, it provides a framework for experts, fourth, its anonymity helps avoid the influence from other group members and finally, it produces a precise documented record.

Table 1. List of Panel of experts for the Delphi method

№	Name	Position	Sector	Current Organization
1.	Mrs. Abeba Nigussie	Manger	Banking	XZ Bank of Ethiopia
2.	Mr. Belay Asrat	Team Leader	Banking	XZ Bank of Ethiopia
3.	Mr. Cherenet Solomon	Supervisor	Banking	XZ Bank of Ethiopia
4.	Mr. Dawit Ayalew	Supervisor	Banking	XZ Bank of Ethiopia
5.	Mr. Ephraim Tadesse	Supervisor	Banking	XZ Bank of Ethiopia
6.	Mr. Feleke Mekuria	Project Coordinator	Former Banking	JK Exchange
7.	Mr. Getachew W/Mariam	Manger Finance	Former Banking	JK Exchange
8.	Mr. Hialu Kebede	Researcher	Finance	MN Consult PLC
9.	Mr. Imeru Gobeze	Researcher	Finance	MN Consult PLC
10.	Mr. Jareso Kena	Columnar of a Business Magazine	Finance	CM Business Review
11.	Mr. Ketema Ashenifi	BSC Team Leader	Insurance	ABC Insurance
12.	Mr. Lemma Abebe	BSC Team Member	Insurance	ABC Insurance
13.	Mr. Mulugeta Tegegne	BSC Team Member	Insurance	ABC Insurance
14.	Mr. Nahom Yibeletal	BSC Team Member	Insurance	ABC Insurance
15.	Mr. Obssa Adugna	Management Trainee	Former Academics	HM Bank of Ethiopia
16.	Mr. Paulos Amare	Management Trainee	Former Academics	HM Bank of Ethiopia
17.	Mr. Qetessa Chemeda	Management Trainee	Former Academics	HM Bank of Ethiopia
18.	Mr. Reta Henock	Credit Analyst	Former Academics	MD Bank S.C.
19.	Mr. Samuel Ferede	Department Head	Academics	ABC University
20.	Mr. Tamerat Mohamed	Instructor/Lecturer	Academics	ABC University
21.	Mr. Umar Said	Instructor/Lecturer	Academics	ABC University
22.	Mr. Wossen Yelema	Instructor/Lecturer	Academics	ABC University
23.	Mr. Yared Setegne	Instructor/Lecturer	Academics	ABC University

For the purpose of this study deliberate sampling was used. According to Kothari et. al. (2004) Deliberate is a

sampling method that involves purposive selection of particular units of the universe for constituting a sample which represents the universe. The reason behind using deliberate sampling is the fact that the study involves industry experts and hence, arguably experts in banking and finance and related areas would offer rich information or have the ability to rate the criteria and sub-criteria more accurately.

There is no hard and fast rule for determining the sample size of participants for application of the Delphi technique. According to Skulmoski, Hartman and Krahn (2007) the sample size used for Delphi method is arbitrary. In addition different studies using the Delphi method use different sample size, for instance Chan, Yung, Lam, Tam & Cheung et, al, (2001) use ten participants from academics, public and private sectors, while, Dagenais (1978) who has studied the reliability of the Delphi technique uses eleven panelists. As Powell et, al, (2003) puts it;

> *"There is very little actual empirical evidence on the effect of the number of participants on the reliability or validity of consensus processes. The Delphi does not call for expert panels to be representative samples for statistical purposes. Representativeness, it seems is assessed on the qualities of the expert panel rather than its numbers." p. 378.*

Hence, the panels of experts used for this study were twenty three (see table 1). In order to arrive at an objective decision and incorporate the different perspectives of experts diverse professionals were considered. Particularly, these participants included;

1. Experts familiar with BSC performance management and/or measurement tool.
2. Banking and finance professionals.
3. Experienced professionals in financial research and authorship
4. Professionals in academics, specifically finance and economics.
5. Experts in bank regulation and supervision and
6. Experts with a blend of experience in academics and banking.

The Balanced Score Card (BSC) Model to Financial Performance Measurement

BSC has gone though several changes since its introduction in 1992 by Kaplan & Norton (Kaplan, 2010); today BSC is a tool that has four perspectives (Financial, Customer, Internal Process, Learning and Growth) that reflect organization's actual performance (see figure 1). The financial perspective typically relate to measures of profitability, including operating income, return on capital, economic value added and rapid sales growth or generation of cash flow. Second, customer perspective is about meeting and exceeding customers' expectations and such performance measures are customer satisfaction, customer retention, new customer acquisition, market position, and market share in targeted segments (Wu, Lin & Tsai, 2011).

Third, internal business process; banks evaluate organizational performance on the basis of: innovation in system programming, certification of a financially integrated professional platform, operating quality of a group of customers, internal customer satisfaction, and management stratum support and finally the learning and growth perspective can be measured by: staff's professional knowledge, education and training of staff, scale of team, banks complaint system, and appropriateness of performance policies for rewards and punishments (Kaplan, et, al, 2010)

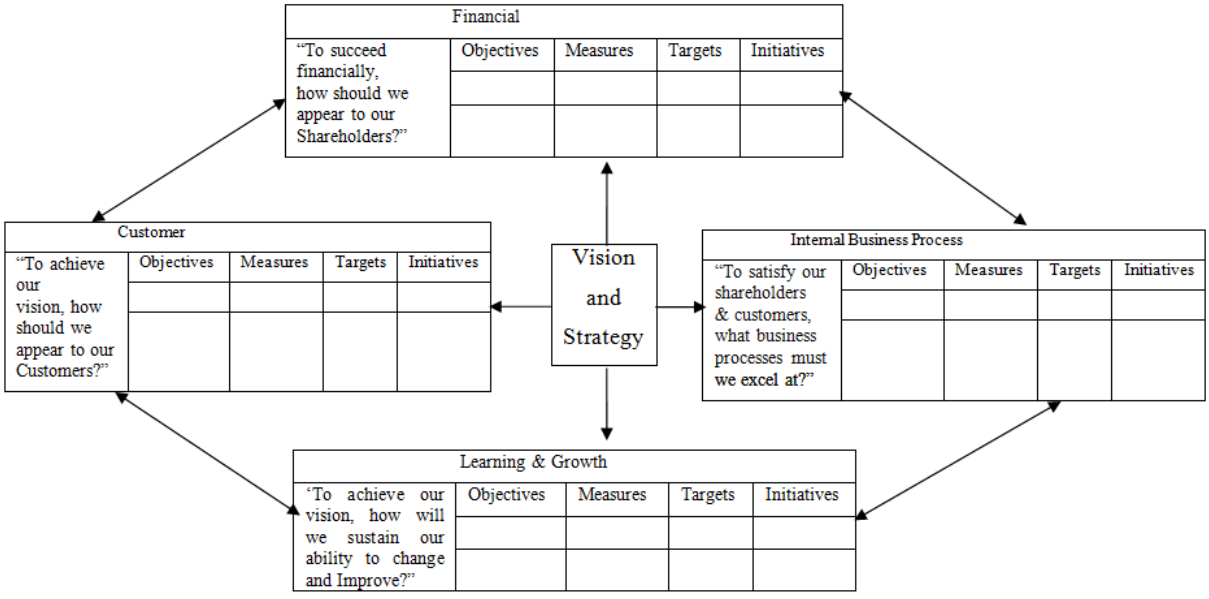

Figure 1. Translating Vision and Strategy: Four Perspectives adapted (Kaplan, et, al, 2010)

Hence, the purpose of this study was to measure the performance of the commercial banking sector here in

Ethiopia. However, using the BSC to measure performance of commercial banks results in multiple criteria decision making problem necessitating the use of either mathematical or analytical models that help identify the best performing bank. Thus, among the multi criteria decision making (MCDM) tools, analytical hierarchy process (AHP) is by far the best method because it is the most widely used, easily understood and most importantly it's the best tool to combine both objective as well as subjective decisions (Tahriri, Osman, Ali & Yusuff, 2008).

AHP Procedure

Step 1. The problem is selecting the best performing bank among sampled commercial banks here in Ethiopia. The best alternative bank must be selected according to four criteria or four perspectives of the BSC approach that is internal process, customer, growth and learning and financial perspectives.

Step 2. Developing the hierarchical structure of the problem (see figure 2).

Step 3. The Saaty's scale of comparisons in a multi-criteria decision making as stated in Table 2.

Adoption of Saaty's scale is well supported by the study conducted by Kumar and Ganesh (1996) cited in Dong, Xu, Li and Dai (2007) which had compared different numerical scales and prioritizations and their result revealed that prioritizations using the eigenvalue method (EVM) is better than the logarithmic least squares methods (LLSM) using the simulation method of Triantaphyllou and Mann (1990).

Table 2. The Saaty's scale of comparisons in a multi-criteria decision making (Saaty, 2008).

Intensity of Importance	*Definition*	*Explanation*
1	Equal Importance	Two activities contribute equally to the objective
2	Weak or slight	
3	Moderate importance	Experience and judgment slightly favors one activity over another
4	Moderate plus	
5	Strong importance	Experience and judgment strongly favors one activity over another
6	Strong plus	
7	Very strong or demonstrated importance	An activity is favored very strongly over another; its dominance demonstrated in practice
8	Very, very strong	
9	Extreme importance	The evidence favoring one activity over another is of the highest possible order of affirmation
Reciprocals of above	If activity *i* has one of the above non-zero numbers assigned to it when compared with activity *j*, then *j* has the reciprocal value when compared with *i*	A reasonable assumption
1.1–1.9	If the activities are very close	May be difficult to assign the best value but when compared with other contrasting activities the size of the small numbers would not be too noticeable, yet they can still indicate the relative importance of the activities.

Step 4. Construct a set of pairwise comparison matrices. Each element in an upper level is used to compare the elements in the level immediately below with respect to it (Saaty, et. al.).

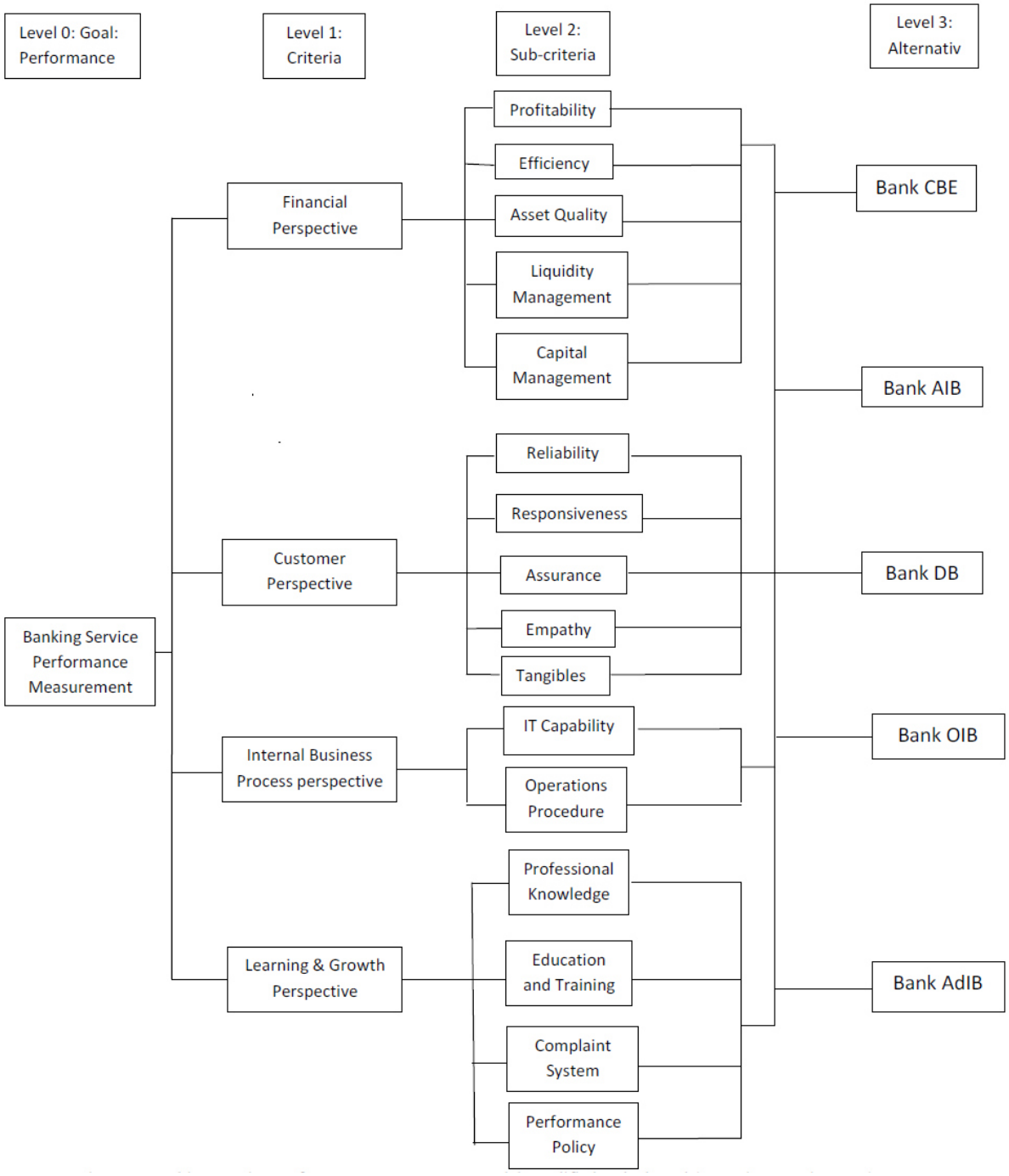

Figure 2. Banking Service Performance Measurement Model, modified and adapted (Wu, Lin & Tsai, 2011)

Step 5. (*Perform consistency check*) Prof. Saaty proved that for consistent reciprocal matrix, the largest Eigen value is equal to the size of comparison matrix, or max $\lambda = n$. Then he gave a measure of consistency, called Consistency Index as deviation or degree of consistency using the following formula (Teknomo, 2006).

$$CI = \frac{\lambda max - n}{n-1} \quad \text{..... Equation 1}$$

Table 3. Number of comparison

Number of things	1	2	3	4	5	6	7	N
Number of comparison	0	1	3	6	10	15	21	$\frac{n(n-1)}{2}$

$$N = \frac{n(n-1)}{2}$$ ..... Equation 2

Then, he proposed what is called Consistency Ratio, which is a comparison between Consistency Index and Random Consistency Index, or in formula, (Teknomo, et. al., 2006).

$$CR = \frac{CI}{RI}$$ ..... Equation 3

If the value of Consistency Ratio is smaller or equal to 10%, the inconsistency is acceptable. If the Consistency Ratio is greater than 10%, we need to revise the subjective judgment.

Table 4. Random Index (R.I)

Matrix Size	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
R.I.	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

Table 5 contains the random index values calculated from randomly generated weights as a function of the pair-wise matrix size or number of criteria (Ravindran, (Eds.), 2009).

Step 6. Use the priorities obtained from the comparisons to weigh the priorities in the level immediately below. Do this for every element. Then for each element in the level below add its weighed values and obtain its overall or global priority. Continue this process of weighing and adding until the final priorities of the alternatives in the bottom most level are obtained (Saaty et. al., 2008).

AHP Application

The four main criteria of the multiple decision making structure are adopted from the BSC, developed by Kaplan & Norton and which had come a long way to being applied in different business settings including but not limited to the service sector (Kaplan, et, al. 2010). Hence, table 5, shows the experts' rating of the relative importance between the four perspectives particularly, financial, customer, internal business process and learning and growth perspectives or criteria for evaluation of performance of banking service of the five sampled commercial banks.

Table 5 Pairwise Comparison Matrix for the Four Criteria

Criteria	Financial	Customer	Internal Process	L & Growth
Financial	1.0000	0.5816	1.2976	1.5002
Customer	1.7194	1.0000	1.7639	1.5094
Internal Process	0.7707	0.5669	1.0000	0.7979
L & Growth	0.6666	0.6625	1.2533	1.0000
Total	4.1567	2.8110	5.3148	4.8075

Table 6 Synthesized (Normalized) Matrix for the Four Criteria (CR=0.01)

Criteria	Financial	Customer	Internal Process	Learning & Growth	Preference Vector	λ max
Financial	0.2406	0.2069	0.2441	0.3120	0.2509	1.042978
Customer	0.4136	0.3557	0.3319	0.3140	0.3538	0.994578
Internal Process	0.1854	0.2017	0.1882	0.1660	0.1853	0.984839
Learning & Growth	0.1604	0.2357	0.2358	0.2080	0.2100	1.009416
Sum					1.0000	4.031811

Table 6 above depicts the normalized or synthesized matrix of the four criteria and further by using equation 1 described in the procedure section of this study the calculated CI value is 0.011. Moreover using equation 3 the CR value is stated at 1.17% which is much lower than the 10% requirement set by Saaty. As the result the comparison is considered consistent.

Financial Perspective (Criteria)

The financial perspective of the BSC for the commercial banking industry has been deconstructed into five dimensions of financial measurements: profitability, efficiency, asset quality, liquidity management and capital management.

Table 7 Pairwise Comparison Matrix for the Five Sub-criteria of the Financial Criteria

	Profitability	Efficiency	Asset Qual.	Liquidity MGT	Capital MGT
Profitability	1.0000	0.8797	0.9829	0.9909	1.0896
Efficiency	1.1367	1.0000	1.4605	1.1450	1.5017
Asset Qual.	1.0174	0.6847	1.0000	0.8121	1.6023
Liquidity MGT	1.0092	0.8734	1.2314	1.0000	1.5363
Capital MGT	0.9178	0.6659	0.6241	0.6509	1.0000
Total	5.0811	4.1037	5.2989	4.5989	6.7299

Table 8 Synthesized Matrix for the Five Sub-criteria of Financial Criteria (CR=0.006)

Sub-criteria	Profitability	Efficiency	Asset Qual.	Liquidity MGT	Capital MGT	Priority Vector	λ max
Profitability	0.1968	0.2144	0.1855	0.2155	0.1619	0.1948	0.9898
Efficiency	0.2237	0.2437	0.2756	0.2490	0.2231	0.2430	0.9973
Asset Qual.	0.2002	0.1668	0.1887	0.1766	0.2381	0.1941	1.0285
Liquidity MGT	0.1986	0.2128	0.2324	0.2174	0.2283	0.2179	1.0021
Capital MGT	0.1806	0.1623	0.1178	0.1415	0.1486	0.1502	1.0106
Sum						1.0000	5.0283

Tables 7 and 8 above show the comparison matrix and the synthesized matrix of the expert scores for the sub-criteria of the financial perspective. Moreover, a consistency check of these measurement sub-criteria revealed that the comparison is consistent at CR, 0.6% which is way less than the 10% requirement stated by Saaty.

Customer Perspective (Criteria)

The customer perspective is adopted from SERVQUAL model of customer satisfaction measurement: a tool that involves five dimensions of quality parameters originally developed by (Parasuraman, Berry, & Zeihaml, 1988) to assess customer perceptions of service quality in service and retail businesses but later applied in almost all service situations (Gibson, 2009). Hence, the five sub-criteria used to measure the customer perspective were reliability, responsiveness, assurance, empathy and tangibles.

Tables 9 and 10 present the pairwise comparisons of the experts' opinion and the Synthesize matrix of the five sub-criteria. In addition the sub-criteria have been tested for consistency and the result indicates that the measurement criteria are consistent at consistency ratio (CR) of 0.7% which is much lower than 10% requirement.

Table 9 Pairwise Comparison Matrix for the Five Sub-criteria of the Customer Criteria

	Reliability	Responsiveness	Assurance	Empathy	Tangibles
Reliability	1.0000	1.6654	1.4317	1.4933	1.8356
Responsiveness	0.6005	1.0000	1.1281	1.6598	1.3586
Assurance	0.6985	0.8864	1.0000	1.5841	1.2577
Empathy	0.6697	0.6025	0.6313	1.0000	0.8930
Tangibles	0.5448	0.7360	0.7951	1.1198	1.0000
	3.5134	4.8903	4.9862	6.8571	6.3449

Table 10 Synthesized Matrix for the Five Sub-criteria of Customer Criteria (CR=0.007)

	Reliability	Responsiveness	Assurance	Empathy	Tangibles	Priority Vector	λ max
Reliability	0.2846	0.3405	0.2871	0.2178	0.2893	0.2839	0.9974
Responsiveness	0.1709	0.2045	0.2262	0.2421	0.2141	0.2116	1.0346
Assurance	0.1988	0.1813	0.2006	0.2310	0.1982	0.2020	1.0071
Empathy	0.1906	0.1232	0.1266	0.1458	0.1407	0.1454	0.9970
Tangibles	0.1551	0.1505	0.1595	0.1633	0.1576	0.1572	0.9974
						1.0000	5.0334

Internal Business Process Perspective (Criteria)

The third criteria internal business process was operationalized into two criteria: operational procedure and IT capability of the banks. Hence tables 11 and 12 display the pairwise comparison matrix for the two sub-criteria and the synthesized (normalized) matrix respectively.

Table 11 Pairwise Comparison Matrix for the Two Sub-criteria of Internal Business Process

	IT Capability	Operation Procedure
IT Capability	1.0000	1.1933
Operation Procedure	0.8380	1.0000
	1.8380	2.1933

Table 12 Synthesized Matrix for the Two Sub-criteria of Internal Business Process Criteria

	IT Capability	Operation Procedure	Priority Vector	λ max
IT Capability	0.5441	0.5441	0.5441	1
Operation Procedure	0.4559	0.4559	0.4559	1
			1.0000	2

Since, consistency relates to the property of transitivity. Hence, the least number of elements subject to the theory of transitivity are three (A, B & C) (Teknomo, et. al, 2006). Thus since the comparison in appending tables involves two variables it doesn't necessitate a consistency check. Moreover, the consistency index (CI) for a comparison of two items is "0" further supporting the above position (Ravindran (Eds.), et, al., 2009).

Learning and Growth Perspective (Criteria)

The learning and growth perspective has been modified and adopted from the works of Wu, Lin & Tsai, et, al. (2011) and was further deconstructed into professional knowledge of bank employees, education and training, complaint system in place and performance policy of the particular bank under observation.

Table 13 Pairwise Comparison Matrixes for the Four Sub-criteria of Learning & Growth

	Professional Knowledge	Education & Training	Complaint System	Performance Policy
Professional Knowledge	1.0000	1.1514	1.8076	1.1464
Education & Training	0.8685	1.0000	1.4464	1.4605
Complaint System	0.5532	0.6914	1.0000	0.3408
Performance Policy	0.8723	0.6847	2.9340	1.0000
	3.2940	3.5275	7.1880	3.9477

Table 14 Synthesized Matrix for the Four Sub-criteria of Learning & Growth (CR=0.04)

	Professional Knowledge	Education & Training	Complaint System	Performance Policy	Priority Vector	λ max
Professional Knowledge	0.3036	0.3264	0.2515	0.2904	0.2930	0.9566
Education & Training	0.2637	0.2835	0.2012	0.3700	0.2796	0.9862
Complaint System	0.1679	0.1960	0.1391	0.0863	0.1473	1.0592
Performance Policy	0.2648	0.1941	0.4082	0.2533	0.2801	1.1058
					1.0000	4.1077

Tables 13 and 14 depict the pairwise comparison and synthesized (normalized) matrices of the four sub-criteria for the learning and growth in the sequence stated. Moreover, to validate the sub-criteria of a reliable comparison consistency index (CI) and consistency ratio (CR) have been calculated. Consequently, a CR score of around 4% has been obtained which implies that the expert judgment is consistent.

Determination of Global Rating

This section of the AHP analysis summarizes the forgoing comparisons into the overall score so that the banks can ranked accordingly. Table 15 shows the priority vector for the four criteria namely, financial, customer, internal business process and learning and growth along with the preference vector for each criterion. In addition the score of each bank can be obtained from the table for instance CBE scores around 34% on finical criterion, 33% on customer, 38% on internal business process and 35% on learning and growth as rated by experts.

Table 15 Priority Matrix of Best Performing Bank Selection Alternatives

	Banking Service Performance Measurement				Sum
Banking Alternatives	Financial	Customer	Internal Process	L & Growth	
CBE	0.3353	0.3327	0.3760	0.3486	
AIB	0.2027	0.2108	0.1728	0.1939	
DB	0.2128	0.1889	0.1893	0.1884	
OIB	0.1425	0.1507	0.1551	0.1469	
AdIB	0.1067	0.1169	0.1067	0.1222	
Preference Vector	0.2509	0.3538	0.1853	0.2100	1.0000

Based on the above table, the overall ranking of the sampled banks can be calculated for instance CBE's overall or global score can be calculated as stated below:

CBE= (0.3353) (0.2509) + (0.3327) (0.3538) + (0.3760) (0.1853) + (0.3486) (0.2100)

= 0.3447

Table 16 Overall Ranking Matrix of Best Performing Bank Selection Alternatives

Banking Alternatives	Overall Ranking				Global Score
	Financial	Customer	Internal Process	Learning & Growth	
CBE	0.0841	0.1177	0.0697	0.0732	0.3447
AIB	0.0509	0.0746	0.0320	0.0407	0.1982
DB	0.0534	0.0668	0.0351	0.0396	0.1949
OIB	0.0358	0.0533	0.0287	0.0308	0.1487
AdIB	0.0268	0.0413	0.0198	0.0257	0.1136
Sum					1.0000

Hence, the above table reveals that CBE is the best performing commercial bank among the five sampled commercial banks with a score of 34.47%; registering a significant gap with the second best performer AIB which has an overall rating 19.82%. Thus, AIB's 19.82% granted it the privilege of having a slider advantage over DB which stands third with a score of 19.49%. Further, OIB stands fourth scoring 14.87%, having a fairly significant difference with DB in third place and finally AdIB stands fifth having the score of 11.36%. Hence, the rank can simply be stated as CBE >AIB >DB >OIB>AdIB.

Financial Performance Based Ranking

As most important quest in this particular investigation is to identify or select the best performing commercial bank amid the five banks considered for this analysis. The ratio analysis was conducted based on five dimensions and twenty measures modified and adopted from Kapur & Abebaw (2012). To further, compare this result with the result obtained from the AHP analysis in the discussion section of this study.

It has to be noted that a higher score in every category doesn't lead to the best overall score. The reason behind this supposition is being a higher score in certain criterions such as equity multiplier imply an insolvency of a given firm (Shaik, et, al, 2014). Hence, the lowest ratio in EMs leads to the highest score of five and the same is true for Staff Cost (SCs), General Expense to Asset (GEA), Provision to Loan (PL), Provisions to Asset (PA) and cost to income (CI).

Table 17 Rank of Five Sampled Commercial Banks Based on Their Financial Performance

Financial Performance of Sampled Banks										
Period (2009-2012)										
Description	**Average Ratios**					**Score**				
	CBE	**AIB**	**DB**	**OIB**	**AdIB**	**CBE**	**AIB**	**DB**	**OIB**	**AdIB**
ROAs	0.0273	0.0339	0.0329	0.0143	0.0344	2	4	3	1	5
ROEs	0.3896	0.2741	0.3465	0.0932	0.0900	5	3	4	2	1
PMs	0.4451	0.3510	0.3490	-0.1116	0.2052	5	4	3	1	2
NIMs	0.0317	0.0489	0.0484	0.0351	0.0572	1	4	3	2	5
NNIMs	0.0291	0.0471	0.0455	0.0458	0.1106	1	3	2	4	5
ERs	2.4115	1.8538	1.8699	0.9613	1.0986	5	3	4	1	2
CIs	0.2637	0.4897	0.4751	1.5386	1.5774	5	3	4	2	1
GEAs	0.0066	0.0094	0.0112	0.0160	0.0356	5	4	3	2	1
SCs	0.4814	0.5071	0.4547	0.4349	0.2185	2	1	3	4	5
PLs	0.0240	0.0414	0.0215	0.0110	0.0102	2	1	3	4	5
Pas	0.0083	0.0172	0.0095	0.0038	0.0037	3	1	2	4	5
EP	0.1315	0.2080	0.2006	0.3008	0.4804	1	3	2	4	5
LADs	0.5909	0.5426	0.5119	0.6964	0.7511	3	2	1	4	5
LAAs	0.4497	0.4175	0.4157	0.4828	0.3739	4	3	2	5	1
LDs	0.3917	0.5437	0.5405	0.4947	0.7308	2	4	1	3	5
Ems	0.1487	0.0811	0.1057	0.0500	0.0261	1	3	2	4	5
CAs	0.0658	0.1248	0.0960	0.2085	0.3824	1	3	2	4	5
CLs	0.1926	0.2990	0.2191	0.6017	1.0513	1	3	2	4	5
CNLs	0.1974	0.3119	0.2239	0.6081	1.0621	1	3	2	4	5
CDs	0.0894	0.1623	0.1183	0.3115	0.7683	1	3	2	4	5
Sum of Scores						51	58	50	63	78
Rank						**4**	**3**	**5**	**2**	**1**

Source: Own Calculation from NBE's Annual Reports

Consequently, the result indicated that AdIB is the bank of choice securing an overall score of 78% followed by OIB with an overall rating of 63%, standing third is AIB scoring 58% and the fourth place belongs to CBE and final spot goes to DB making it the least preferred commercial bank among the five sampled commercial banks

as measured financially.

DISCUSSIONS

The primary intention of the study was to identify the best mechanism to measure banking service performance to overcome the problems associated with merely depending on conventional financial ratio analysis; as financial ratio analysis is more about the past. In contrast, the BSC model which captures the four important dimensions of a business operation (financial, Customer, internal business process, learning and growth) coupled with AHP yet another powerful tool that combines subjective judgment of experts with an objective analysis, can arguably offer a better result. Hence, a combination of techniques using BSC and AHP approaches offers a more realistic result as compared to the conventional financial ratio analysis.

Perhaps the secondary intention of the study was to identify the best performing commercial bank among the five sampled commercial banks; which can meet and/or exceed customers' expectations and CBE is rated as the best performing commercial bank by the panel of experts based on the four perspectives (criteria) of the BSC (Financial, Customer, Internal Business Process and learning and Growth).

Hence, this could be associated with CBE's conscious adoption and implementation of the BSC, which might have allowed CBE to identify the alignment and misalignment of corporate goals to actual performance in service delivery and take corrective measures instantly if, need be. Consequently, the rest of the commercial banking industry could draw a lesson from CBE's triumph in adopting a multi-dimensional performance management tool that can assure financial as well as non-financial victory in the bid to bit competition.

CONCLUSION

A comparison between the result obtained through the conventional financial ratio analysis and AHP analysis framed on BSC approach indicated how businesses simply get blinded if they solely depend on financial performances. As financial analysis is of the past there is no guarantee that the past will prevail in the future. However, the result achieved using the combination of the AHP and BSC approaches offer a more reliable result as it considers every possible dimension of the business. More simply, since the BSC considers customers, learning and growth and internal business process on top of the financial performance measurement it would be safer to conclude that a bank rated as the best performer using this framework will arguably continue to do so in the future.

References

Best, R. J. (1974). An experiment in Delphi estimation in marketing decision making, *Journal of Marketing Research*, 11, 447-468.

Blavin, E., & Buntin, M. B. (2013). Forecasting the use of electronic health records: an expert opinion approach, *Medicare & Medicaid Research Review*, 3(2), 1-15.

Brüggen, E., & Willems, P. (2009). A critical comparison of offline focus groups, online focus groups and e-Delphi, *International Journal of Market Research*, 51(3), 363-381.

Chan, A. P. C., Yung, E. H. K., Lam, P. T. I., Tam, C.M. & Cheung, S. O. (2001). Application of Delphi method in selection of procurement systems for construction projects, *construction management and economics,* 19, 699–718.

Dagenais, F. (1978). The reliability and convergence of the Delphi technique, *The Journal of General Psychology*, 98, 307-308.

Dong, Y., Xu, Y., Li, H. and Dai, M. (2007). A comparative study of the numerical scales and the prioritization methods in AHP. *European Journal of Operational Research* 186(2008): 229-242.

Elmer, F., Seifert, I., Kreibich, H. & Thieken, A. H. (2010), A Delphi method expert survey to derive standards for flood damage data collection, *Society of Risk Analysis,* 30(1), 107-124.

Fahlenbrach, R. Prilmeier, R. & Stulz, R. (2012). This time is the same: using bank performance in 1998 to explain bank performance during the recent financial crisis, *The Journal of Finance*, LXVII (6), 2139-2185.

Fernando, C. S., May, A. D. & Megginson, W. L. (2012). The value of investment banking relationships: evidence from the collapse of Lehman Brothers, *The Journal of Finance*, LXVII (1), 235-270.

Gibson, C. (2009). *Using the SERVQUAL to assess customer satisfaction level the Oregon HIDTA ISC analytical unit*, Unpublished Manuscript, Hatfield School of Government Executive Master of Public Administration 2009 Cohort, Portland University.

Gray, P. & Hovav, A. (2008). From hindsight to foresight: applying futures research techniques in information systems, *Communications of the Association for Information Systems (CAIS)*, 22(12), 211-234.

Hallowell, M. R., & Gambatese, J. A. (2010). Qualitative research: application of the Delphi method to CEM research, *Journal of Construction Engineering and Management*, 136(1), 99-107

Harvard Business Review (2010). Conceptual foundations of Balanced Scorecard (Working Paper No. 10-074),

Boston: Kaplan, R. S.
Heath, A. E., Neimeyer, G. J. & Pedersen, P. B. (1988). The future of cross-cultural counseling: Delphi roll, *Journal of Counseling and Development*, 67, 27-30.
Herrmann, A. (2013). The quantitative estimation of IT-related risk probabilities, *Risk Analysis*, 33(8), 1510-1531.
Kang, H. (2011). A multi-criteria decision-making approach for capacity allocation problem in semiconductor fabrication, *International Journal of Production Research*, 49(19), 5893–5916.
Kapur, D. & Abebaw, K., G. (2012). Financial performance and ownership structure of Ethiopian commercial banks. *Journal of Economics and International Finance*, 4 (1), 1–8.
Khayun, V., Ractham, P., & Firpo, D. (Spring, 2012). Assessing e-excise success with Delone and Mclean's model, *Journal of Computer Information System*, 31-40.
Kiyota, K., Peitsch, B., & Stern, R. M. (2007). *Case for financial sector liberalization in Ethiopia*, International Policy Center, Gerald R. Ford School of Public Policy, University of Michigan
Korten, F., Caluwe, L. D. & Geurts (2010). The future of organizational development: A Delphi study among Dutch experts, *Journal of Change Management*, 10(4), 393–405.
Kothari, C. R. (2004). *Research methodology: Methods & techniques (2nd, ed.)*. New Delhi: New Age International (p) Limited, Publishers.
Melnyka, S. A., Lummusb, R. R., Vokurkac, R. J., Burnsa, L. J., & Sandora, J. (2009). Mapping the future of supply chain management: a Delphi study, *International Journal of Production Research*, 47(16), 4629–4653.
Milkovich, G. T., Annoni, A. J., & Mahoney, T. A. (1972). The use of the Delphi procedures in manpower forecasting, *Management Science*, 19(4), 381-388.
Peng, J., Groenewold, N., Fan, X. & Li, G. (March-April, 2014). Financial system reform and economic growth in a transition economy: The case of China, 1978–2004, *Emerging Markets Finance & Trade,* 50 (2), 5–22.
Pina, V., Torres, L. & Yetano, A. (winter, 2011). The implementation of strategic management in local governments: an international Delphi study, *Public Administration Quarterly*, 552-590.
Powell, C. (2003). The Delphi technique: myths and realities, *Journal of Advanced Nursing,* 41(4), 376–382.
Ravindran, A. R. (Eds.) (2009). *Operations research: Applications*: New York, CRC Press; Taylor & Francis Group.
Rupprecht, M., Birner, K., Gruber, H., & Mulder, R. H. (2011). Dealing with diversity in consulting teams: results of two Delphi studies, *Human Resource Development International*, 14(5), 561–581.
Saaty, T. L. (2008). Decision making with the analytic hierarchy process. *International Journal of Services Sciences*, 1(1), 83-98.
Saizarbitoria, I. H. (2006). How quality management models influence company results: conclusions of an empirical study based on the Delphi method, Total Quality Management, 17(6), 775–794.
Shaik, A. M. P., (2014, March). *Ethiopian banking sector financial performance: An analysis,* Paper presented at an International Conference on Technology and Business management, Arba Minch University, Ethiopia, Arba Minch.
Singh, A. J., & Schmidgall, R. S. (2004). Future events and their impact on financial management in the US lodging industry: Delphi study to predict changes in 2007 and 2027, *Journal of Retail & Leisure Property*, 4 (3), 2 3 6 – 2 5 4.
Skulmoski, J. G., Hartman, T. F., & Krahn, J. (2007). The Delphi method for graduate research. *Journal of Information Technology Education* 6, 1-21.
Tahriri, F., Osman, M. R., Ali, A., and Yusuff, R. M. (2008). A review of supplier selection methods in manufacturing industries, *Suranaree Journal of Science and Technology*, 15(3), 202-208.
Teknomo, K. (2006). Analytic Hierarchy Process (AHP) Tutorial. Available at http://people.revoledu.com/.
Tilahun, E. K. (2012). Ethiopia's WTO accession and financial services liberalization: striking the balance between trade liberalization and domestic policy space, *Miza Law Review*, 6 (2), 200-240.
Turoff, H. A. & Linstone, M. (Eds.) (2002). *The Delphi method techniques and applications*, University of Southern California.
Vyas, D. (2011). The timeliness of accounting write-downs by U.S. financial institutions during the financial crisis of 2007–2008, Journal of Accounting Research, 49(3), 823-860.
Watkins, J. (2014, Winter). The future of finance: the post-crisis commercial culture, Harvard International Review, 8-10
Wu, C., Lin, C. & Tsai, P. (2011). Financial service sector performance measurement model: AHP sensitivity analysis and balanced scorecard approach. *The Service Industries Journal*, 31(5), 695–711.
Yung, X., Zeng, L. & Zhang, R. (2012). Cloud Delphi method, *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, 20(1), 77-97.

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