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The Effectiveness of Banks' Web Sites: A Study of Turkish Banking Sector

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***Abstract*—**By the development of World Wide Web, the usage rate of Internet has rapidly grown globally; and provided a basis for the emergence of electronic business. As well as other sectors, the banking sector has adopted the use of internet with the developments in information and communication technologies. Due to the public disclosure and transparency principle of Corporate Governance, the importance of information disclosure of banks on their web sites has increased significantly. For the purpose of this study, a Bank Disclosure Attribute Index (BDAI) in Turkey has been constructed through classifying the information disclosure on banks' web sites into general, financial, investors and corporate governance attributes. All 47 banks in Turkish Banking System have been evaluated according to the index with the aim of providing a comparison between banks. By Chi Square Test, Pearson Correlation, T-Test, and ANOVA statistical tools, it has been concluded that the majority of banks in Turkey have shared information on their web sites adequately with respect to their total index score. Although there is a positive correlation between various types of information on banks' web sites, there is no uniformity among them. Also, no significant difference between various types of information disclosure and bank types has been observed. Compared with the total index score averages of the five largest banks in Turkey, there are some banks that need to improve the content of their web sites.

***Keywords*—**Banking sector, public disclosure, Turkey, web site evaluation.

I. Introduction

INTERNET, which is described as a global computer network that provides a variety of information and communication facilities [1], is used by individuals and businesses for an incrementally wide range of purposes. According to We Are Social's report, which is prepared by using Global Web Index data, 46.2% of world population is active internet users and this ratio has increased by 51.5% in 5 years. The overall internet usage information between the years 2011 and 2015 has been shown in Table I. When this is compared with the world average, it is seen that the internet access and usage ratios in enterprises, households and individuals in Turkey is higher. According to the "Information Society Statistics" made by Turkish Statistical Institute, 92.5% of the enterprises in Turkey have internet access, whereas 65.5% of them had their own web sites in 2015. There are no significant differences among the ratios of computer usage and internet access in the enterprises in the last 5 years, but there is 18.2% increase in having their own web sites. The internet usage ratio in households and individuals in 2015 is 55.9%, and it has increased by 34% in 5 years. The usage of information and communication technology in enterprises, households and individuals between 2011 and 2015 has been shown in Table II.

TABLE I
GLOBAL DIGITAL STATISTICS, 2011-2015 [2]

	2011	2012	2013	2014	2015
Overall Internet Usage	30,5%	33,2%	35,0%	41,7%	46,2%

TABLE II
INFORMATION FOR SOCIETY STATISTICS IN TURKEY, 2011-2015 [3]

					%
	2011	2012	2013	2014	2015
ICT Usage in Enterprises					
Computer Usage	94,0	93,5	92,0	94,4	95,2
Internet Access	92,4	92,5	90,8	89,9	92,5
Having Web Site	55,4	58,0	53,8	56,6	65,5
ICT Usage in Households and Individuals					
Computer Usage	46,4	48,7	49,9	53,5	54,8
Internet Usage	45,0	47,4	48,9	53,8	55,9
Households with access to the Internet	42,9	47,2	49,1	60,2	69,5

The main reason for the widespread adoption of Internet in the world in this magnitude is the presence of "World Wide Web" in use as well as e-mail and file transfer protocol. Before 1990, the use of the internet had mostly been for academic purposes. With the formation of web, a wider mass of people has accessed to internet [4]. Web is a flexible system of networks, which enables organizations, businesses, associations and individuals to create their own websites, and anyone with access to create their own webpages through bringing together various texts and images. In this case, converting the internet to a suitable platform for multimedia has made it suitable for commercial use [5]. With the increase of commercial use of internet, the concept of electronic business has emerged as a new business perception. E-business is fundamental in the way that business will be done - aided, abetted, supported, and enabled by technology [6]. Although e-business does not just mean World Wide Web, it is the main factor that changes businesses' interactions with customers. Web offers a transparency to whole marketplace enabling more informed parties, and helping the development of customer relationship management.

The developments in information and communication

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technologies have also changed the banking sector globally; due to the structure of financial products and competitive market conditions. In this regard, the information and services that banks offer through their web sites have a significant importance for users. According to the public disclosure and transparency issue of Corporate Governance Principles published by Capital Markets Board of Turkey, the banks and companies which are traded on the stock exchange should use their web sites actively in order to provide the information to the public. In this issue, it is indicated that the information disclosed should be accurate, complete, comprehensible, and easy-to-analyze information which is also accessible at a low cost and in a timely manner [7].

In this study, the information disclosure in banks' web sites in Turkey has been evaluated according to a BDAI under four main attributes: general, financial, investors and corporate governance. Classified by the index, the effectiveness of information disclosure has been measured with the aim of providing a comparison between banks.

II. Literature Review

In Turkey, there are a few studies that have been conducted on the information disclosure levels of businesses on their web sites in different sectors such as education, tourism, and local industrial and commercial enterprises. Fidan has compared the elementary schools' web sites in Turkey with elementary schools' web sites in the U.S.A. in order to investigate their technical designs and contents [8]. Dagitmac has investigated the web sites designs of domestic and international universities in terms of color, typography, texts, menu, pictures, background, animations and icons. Also, the development steps of Yildiz Technical University's web site has been examined [9]. In order to determine the leading elements in design of thermal hotels' web sites in Turkey, Kuzu has considered the technical features and those used for marketing purposes separately [10]. Also, Karamustafa has investigated the web site performance of hotels operating in Turkey within 80 variables under six groups [11]. In another study in Burdur, Turkey, web sites of 128 enterprises have been analyzed with content analyzing method by the issues of marketing, advertising, human resources, and electronic business [5]. Yuksel has conducted in a literature research on quality dimensions of web sites, and has argued the use SERVQUAL model which is used for evaluating the quality of service operations within the concepts of reliability, assurance, tangibles, empathy, and responsiveness in the evaluation of web sites' quality [12].

In banking sector in Turkey, there is a subjective research which was conducted by Buyukersen on the corporate identity of the banks on their web sites in Turkey in the content of logo, color usage, and typography [13]. Dyussemalgyeva has studied on a case study in Kazakhstan in order to define the characteristics required for the web sites of the banks. In the study, 29 Kazakhstan banks have evaluated under knowledge, access, ergonomics, and habits categories with 80 different subjective and objective criteria. As a consequence, the best and the worst web sites have been determined, and the 10 most and least used characteristics have been ascertained [14].

Cox and Dale have focused on key quality factors in web site design and use with a conceptual model based on ease of use, customer confidence, on-line resources, and relationship services [15]. Waite has studied retail bank web sites in order to select a service familiar to consumers for which a web site would serve as both an information source and a transaction channel with a self-administered questionnaire in United Kingdom [16]. Also as in [12], SERVQUAL approach has been used in order to measure the web site quality.

As an empirical research, Charumathi and Surulivel have studied the effectiveness of information disclosure of Indian public sector banks on their web sites. Similar to our study, an index has been constructed under four main categories, and the information disclosure degrees and correlations between them have been determined. Emphasizing the qualitative characteristics of useful financial information identified by International Accounting Standards Board in Conceptual Framework, the study has been concluded with Indian public sector banks have to improve their effectiveness of disclosure [17].

III. Research Methodology

This is an empirical study to examine the effectiveness of information disclosure by Turkish Banks between February 2016 and May 2016. The sample of this study includes all banks (47 banks in total) in Turkish Banking System. 72.34% of Turkish Banks are deposit banks, and the remaining 27.66% are development & investment banks. 12.77% of the banks are state-owned, whereas 31.91% are privately-owned banks and 53.19% are foreign banks. Types and numbers of banks located in Turkey Banking System are shown in Fig. 1.

Fig. 1 Turkish banking system

All of the banks' web sites have been evaluated with the attributes by BDAI which has been constructed under four main headings [17]:

General attributes: Language option, site map, search box, contact us, telephone, e-mail, branches, ATMs, online banking, telebanking, mobile application, latest products and services, calculators, announcements, market news, service charges, contracts, privacy statement, social media links, and

help (frequently asked questions)

Financial attributes: Annual reports, audit reports and financial statements, minutes of general meeting, credit note, and downloads of data

Investor attributes: Investor relations, partnership structure, market value, financial highlight summary, latest stock price, historical share prices, market news, press releases, downloads of data, and contact us

Corporate governance attributes: Corporate governance, organizational structure, vision, mission, policies, investor relations, social responsibility, human resources, contact us, privacy statement, suggestions, and complaints.

The evaluations of web sites have been measured over 100 points where each section has equal weight. According to the bank scores, four hypotheses have been tested by the statistical tools such as Chi Square Test, Pearson Correlation, T-Test and ANOVA.

- Hypothesis I: All the banks have adequate overall information disclosure.
- Hypothesis II: There is no significant correlation between various types of information on banks' web sites.
- Hypothesis III: There is no significant difference between various types of information disclosure and bank types.
- Hypothesis IV: There is no significant difference among the various attributes of information disclosure by the banks.

IV. Results & Discussions

Information disclosure scores of all banks' web sites in Turkish Banking System for each attributes are shown in Table III. Adabank A.Ş. has the minimum total score by 26.25%. Türkiye İş Bankası A.Ş. has the maximum total score by 100.00%. The mean value of all banks' web site score is 70.45% with the standard deviation of 20.73%. The information disclosure range of general attributes is from 6.25% to 25.00%, and its mean value is 17.53% with the standard deviation of 6.36%. The information disclosure range of financial attributes is from 5.00% to 25.00%, and its mean value is 20.96% with the standard deviation of 4.74%. The information disclosure range of investor attributes is from 0.00% to 25.00%, and its mean value is 13.03% with the standard deviation of 6.08%. The information disclosure range of corporate governance attributes is from 7.50% to 25.00%, and its mean value is 18.94% with the standard deviation of 6.18%. The scores of financial attributes are the highest values due to legal obligations in Turkey whereas investor attributes' scores are the lowest.

In order to test Hypothesis I, BDAI scores of banks have been evaluated over their ranges. It has been found that the majority of the banks in Turkish Banking System are above the average in the effectiveness of their web sites. Furthermore, Chi Square Test has been applied in order to discover the association of the total scores of each bank with the total expected value. The expected value has been taken as the median of possible scores. As per the result of Chi Square Test, the value has been found as 98.59% which is considerably enough to accept the Hypothesis II. Hereby, the overall information disclosure of banks in Turkish Banking System is adequate.

For testing Hypothesis II, Pearson Correlation has been calculated between four different categories and total scores. In Table IV, Pearson Correlations and significance values of each attributes have been presented. According to the results in Table IV, Hypothesis II has been rejected; because it has been found that there is a positively significant correlation between four different categories at the 0.05 level of significance.

In Hypothesis III, it has been investigated whether there is a difference between deposit banks and development & investment banks with regard to the information disclosure levels of on their web sites. T-Test has been used, and the results of two-sample assuming unequal variances have been shown in Table V. According to T-Test results, the possibility of non-difference has been found as 27.06% which is quite high. So, it has been concluded that there is no significant difference between the overall index points of deposit banks and development & investment banks at the 0.05 level of significance. Therefore, Hypothesis III has been accepted.

By using ANOVA, shown in Table VI, P-value has been found as $6x10^{-80}$ which means the probability of obtaining these data is quite low where all of the banks have equal average attribute scores. Therefore, Hypothesis IV has been rejected, and it has been concluded that there is significant difference among the various attributes of information at the 0.05 level of significance.

From a different perspective, the total index score averages of the five largest banks in Turkey which are determined based on their assets, Türkiye Cumhuriyeti Ziraat Bankası A.Ş., Türkiye İş Bankası A.Ş., Türkiye Garanti Bankası A.Ş., Akbank T.A.Ş., and Yapı ve Kredi Bankası A.Ş., have been compared with the other banks, and a striking difference has been observed. The mean value of total index scores of top five banks is 95.25%, whereas the other banks' total index scores' mean value is 67.50%. When T-Test has been applied to these two groups, P-value has been observed as $8x10^{-8}$ which explains the statistically significant difference between these groups. T-Test results are shown in Table VII.

V. Conclusion

In this study, an index has been established in Turkey, where the use of internet is above the world average, in order to measure and compare the effectiveness of web sites in banking sector due to public disclosure and transparency principle of Corporate Governance. All banks in Turkish Banking System have been evaluated in accordance with this index. Although reaching the conclusion that the overall information shared by the banks in Turkey on their web sites is sufficient; there is a significant difference between top 5 banks in Turkey and the other banks. Moreover, a positive correlation has been observed between various attributes of banks; which means that if an attribute of a bank has a higher score, there is a tendency to have higher scores in other attributes, or vice versa. On the other hand, there is no uniformity among various attributes of information on banks'

web sites. In order to provide more useful, relevant, and comparable information on the internet to the public, which ensures easy access and timeliness to the users; there are some banks that need to improve the content of their web sites.

APPENDIX

TABLE III
BDAI SCORES OF BANKS IN TURKISH BANKING SYSTEM

No	Name of the Bank	Banking System	General Attributes (25)	Financial Attributes (25)	Investor Attributes (25)	Corporate Governance Attributes (25)	TOTAL SCORE (100)
1	Adabank A.Ş.	PODB	6.25	5.00	7.50	7.50	26.25
2	Akbank T.A.Ş.	PODB	23.75	25.00	20.00	25.00	93.75
3	Aktif Yatırım Bankası A.Ş.	PODIB	21.25	20.00	15.00	22.50	78.75
4	Alternatifbank A.Ş.	FBFT	21.25	25.00	15.00	22.50	83.75
5	Anadolubank A.Ş.	PODB	21.25	25.00	15.00	22.50	83.75
6	Arap Türk Bankası A.Ş.	FBFT	17.50	25.00	12.50	17.50	72.50
7	Bank Mellat	FBBT	10.00	10.00	7.50	15.00	42.50
8	Bank of Tokyo-Mitsubishi UFJ Turkey A.Ş.	FBFT	10.00	20.00	0.00	12.50	42.50
9	BankPozitif Kredi ve Kalkınma Bankası A.Ş.	FDIB	18.75	25.00	12.50	22.50	78.75
10	Birleşik Fon Bankası A.Ş.	BUDIF	15.00	20.00	2.50	20.00	57.50
11	Burgan Bank A.Ş.	FBFT	25.00	20.00	15.00	22.50	82.50
12	Citibank A.Ş.	FBFT	13.75	20.00	7.50	17.50	58.75
13	Denizbank A.Ş.	FBFT	25.00	25.00	25.00	22.50	97.50
14	Deutsche Bank A.Ş.	FBFT	8.75	10.00	10.00	15.00	43.75
15	Diler Yatırım Bankası A.Ş.	PODIB	12.50	20.00	10.00	20.00	62.50
16	Fibabanka A.Ş.	PODB	23.75	20.00	15.00	25.00	83.75
17	Finans Bank A.Ş.	FBFT	25.00	25.00	15.00	25.00	90.00
18	GSD Yatırım Bankası A.Ş.	PODIB	12.50	20.00	12.50	20.00	65.00
19	Habib Bank Limited	FBBT	11.25	15.00	7.50	7.50	41.25
20	HSBC Bank A.Ş.	FBFT	25.00	20.00	20.00	25.00	90.00
21	ICBC Turkey Bank A.Ş.	FBFT	22.50	25.00	15.00	22.50	85.00
22	ING Bank A.Ş.	FBFT	25.00	20.00	15.00	25.00	85.00
23	Intesa Sanpaolo S.p.A.	FBBT	10.00	15.00	10.00	10.00	45.00
24	İller Bankası A.Ş.	SODIB	12.50	25.00	10.00	15.00	62.50
25	İstanbul Takas ve Saklama Bankası A.Ş.	PODIB	13.75	20.00	12.50	20.00	66.25
26	JPMorgan Chase Bank N.A.	FBBT	10.00	15.00	5.00	7.50	37.50
27	Merrill Lynch Yatırım Bank A.Ş.	FDIB	7.50	20.00	7.50	7.50	42.50
28	Nurol Yatırım Bankası A.Ş.	PODIB	10.00	20.00	15.00	20.00	65.00
29	Odea Bank A.Ş.	FBFT	25.00	20.00	15.00	22.50	82.50
30	Pasha Yatırım Bankası A.Ş.	FDIB	20.00	25.00	12.50	22.50	80.00
31	Rabobank A.Ş.	FBFT	8.75	20.00	5.00	15.00	48.75
32	Société Générale (SA)	FBBT	10.00	15.00	5.00	7.50	37.50
33	Standard Chartered Yatırım Bankası Türk A.Ş.	FDIB	13.75	20.00	7.50	10.00	51.25
34	Şekerbank T.A.Ş.	PODB	22.50	25.00	20.00	22.50	90.00
35	The Royal Bank of Scotland Plc.	FBBT	8.75	15.00	5.00	7.50	36.25
36	Turkish Bank A.Ş.	PODB	20.00	20.00	15.00	15.00	70.00
37	Turkland Bank A.Ş.	FBFT	16.25	20.00	15.00	22.50	73.75
38	Türk Ekonomi Bankası A.Ş.	PODB	25.00	25.00	15.00	25.00	90.00
39	Türk Eximbank	SODIB	17.50	25.00	7.50	10.00	60.00
40	Türkiye Cumhuriyeti Ziraat Bankası A.Ş.	SODB	25.00	25.00	12.50	25.00	87.50
41	Türkiye Garanti Bankası A.Ş.	FBFT	25.00	25.00	22.50	25.00	97.50
42	Türkiye Halk Bankası A.Ş.	SODB	22.50	25.00	25.00	25.00	97.50
43	Türkiye İş Bankası A.Ş.	PODB	25.00	25.00	25.00	25.00	100.00
44	Türkiye Kalkınma Bankası A.Ş.	SODIB	13.75	25.00	10.00	22.50	71.25
45	Türkiye Sınai Kalkınma Bankası A.Ş.	PODIB	16.25	25.00	15.00	22.50	78.75
46	Türkiye Vakıflar Bankası T.A.O.	SODB	25.00	25.00	22.50	25.00	97.50
47	Yapı ve Kredi Bankası A.Ş.	PODB	25.00	25.00	22.50	25.00	97.50
	Mean		17.53	20.96	13.03	18.94	70.45
	Standard Deviation		6.36	4.74	6.08	6.18	20.73
	Chi-Square Test		-	-	-	-	0.99

SODB: State-Owned Deposit Banks; PODB: Privately-Owned Deposit Banks; BUDIF: Banks under the Deposit Insurance Fund; FBFT: Foreign Banks Founded in Turkey; FBBT: Foreign Banks Having Branches in Turkey; SODIB: State-Owned Development & Investment Banks; PODIB: Privately-Owned Development & Investment Banks; FDIB: Foreign Development & Investment Banks

TABLE IV
PEARSON CORRELATION BETWEEN ATTRIBUTES

BANKS		TOTAL SCORE (100)	General Attributes (25)	Financial Attributes (25)	Investor Attributes (25)	Corporate Governance Attributes (25)
TOTAL SCORE (100)	Pearson Correlation	-	0.936	0.789	0.881	0.920
	Significance	-	0.000	0.000	0.000	0.000
	N	-	47	47	47	47
General Attributes (25)	Pearson Correlation	0.936	-	0.672	0.786	0.822
	Significance	0.000	-	0.000	0.000	0.013
	N	47	-	47	47	47
Financial Attributes (25)	Pearson Correlation	0.789	0.672	-	0.539	0.657
	Significance	0.000	0.000	-	0.000	0.005
	N	47	47	-	47	47
Investor Attributes (25)	Pearson Correlation	0.881	0.786	0.539	-	0.749
	Significance	0.000	0.000	0.000	-	0.000
	N	47	47	47	-	47
Corporate Governance Attributes (25	Pearson Correlation	0.920	0.822	0.657	0.749	-
	Significance	0.000	0.013	0.005	0.000	-
	N	47	47	47	47	-

TABLE V
T-TEST FOR INFORMATION DISCLOSURE AND BANK TYPES

t-Test: Two-Sample Assuming Unequal Variances		
	Deposit Banks	Development and Investment Banks
Mean	72.02205882	66.34615385
Variance	542.8991199	128.505609
Observation	34	13
Predicted Mean Difference	0	
Df	42	
t Stat	1.116303873	
P(T<=t) one-tailed	0.135319018	
t Critical one-tailed	1.681952357	
P(T<=t) two-tailed	0.270638037	
t Critical two-tailed	2.018081703	

TABLE VI
ANOVA FOR VARIOUS ATTRIBUTES

SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
General Attributes	47	823.75	17.526596	40.386506		
Financial Attributes	47	985	20.957447	22.432932		
Investor Attributes	47	612.5	13.031915	36.939177		
Corporate Governance Attributes	47	890	18.93617	38.245837		
TOTAL SCORE	47	3311.25	70.452128	429.58054		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	106572.78	4	26643.195	234.70665	0.000000	2.4108942
Within Groups	26108,91	230	113,517			
Total	132681,69	234				

TABLE VII
T-TEST FOR TOP 5 BANKS IN TURKEY VS OTHERS

t-Test: Two-Sample Assuming Unequal Variances		
	Top 5	Others
Mean	95.25	67.5
Variance	23.75	395.73
Observation	5	42
Predicted Mean Difference	0	
df	26	
t Stat	7.371309	
P(T<=t) one-tailed	0.000000	
t Critical one-tailed	1.705618	
P(T<=t) two-tailed	0.000000	
t Critical two-tailed	2.055529	

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