

## **A BALANCED SCORECARD APPLICATION IN TURKISH FINANCIAL SECTOR USING BUSINESS INTELLIGENCE**

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### **—Abstract —**

The previous work during the past decade in the area of performance management has underlined that focusing only on financial performance indicators when measuring business performance could be inadequate in today's fierce competitive environment. Modern performance indicators, such as variety of the products and services, service quality, and customer satisfaction, have become more important for corporations, especially for the businesses operating in financial sector. This study provides an application of business performance management via taking into account non-financial performance indicators. The application is based on balanced scorecard methodology in which business intelligence technologies were utilised. The main aim of the study is to offer a methodology in order to improve operational performance. The empirical assessment of the methodology was carried out in a commercial bank operating in the Turkish financial sector. The results of the study indicated that the proposed methodology facilitated the company to increase some of its operational performance indicators including customer satisfaction, business processes and capacity, core competencies and efficiency of information technology usage. Therefore, it is believed that the empirical work that was carried out in this study can stand as an example for future balance scorecard applications in the same application domains.

**Key Words:** *Balanced Scorecard, Non-financial Performance Indicators, Internal Business Perspective, Work Based Performance Management, Business Intelligence*

**JEL classification:** *M150*

### **1. INTRODUCTION**

Balanced usage of financial and non-financial performance measurements have been strongly recommended by academics and professionals. Modern performance measurements such as quality of service and customer satisfaction have become more important, especially in financial sector where competition is fierce (Hussain, 2002). Although there are many studies and research which emphasize the importance of multidimensional performance

measurements, the literature lacks of work that focuses on the applications of performance systems in banking sectors of developing countries.

Even though financial performance criteria are important in performance measurement, the researchers highlight that the scope of the current body of literature is limited. For instance, Ittner and Larcker (1998), Neely (1999), Kaplan and Norton (1996; 2001) and Banker et al. (2000) agreed on that financial measurements are insufficient. Financial measurements should be evaluated and integrated with immeasurable non-economic assets including the high quality of services, the skilled and motivated personnel, and the critical and sensitive processes of firms (Fakhri et al., 2011). The results of empirical studies conducted in recent years proved that the non-financial measurements have an effect on the long-term financial performance (Anderson & Lanen, 1999; Banker et al., 2000). Non-financial performance measurements provide managers with the key knowledge for success (Banker et.al., 2000, Fitzgerald et al., 1991; Kaplan & Norton, 1996). Fisher (1995) identified the need for non-financial performance measurements in three points: the inadequacy of traditional financial performance measurements, the pressure of competition and the fast growth of rival companies. Also, Neely (1999) underlined that changes in organizational tasks and external demand, as well as power of information technology, are the key drivers for requirement of developing new performance measurements other than the traditional ones. This indicates that the traditional performance criteria are not able to reflect the performance of an organization in a comprehensive way (Bourne & Neely, 2002).

The majority of the studies conducted for the non-financial performance measurements focus on manufacturing sector and thereby leave limited work for service industries (Kald and Nilsson, 2000) Some of these studies (Fitzgerald et al., 1991; Hussain et al, 2001; Kaplan and Norton, 2011; Lorenzo, 2008) suggested that multi-dimensional performance measurements should be used in the service sector including banking industry. Ostinelli and Toscano (1994) evaluated two non-financial performance measurements, namely customer satisfaction and quality improvement, as a means of operational management in three Italian banks. Hussain et al. (2002) implemented a study of management evaluation practices on non-financial performance criteria in Finnish, Swedish and Japanese financial institutions. Al- Einizi et al. (2006) applied a model, which contains non-financial performance indicators similar to balanced-scorecard, on four different companies (one of which is a banking organization) in the countries of Persian Gulf Cooperation Council. Hussain and Hoque (2006) investigated the role of management accounting on non-financial performance measurements for financial and banking organizations operating in Japan.

Three main conclusions can be drawn from the current studies in the literature. First, the financial performance measurements are believed to be more standardized than the non-financial ones. Second, the financial performance measurements have been given higher priority in organizations. Third, the non-financial measurements are considered to be more effective than the financial ones. Therefore, the non-financial performance measurements are seen as important tools which need to be used to meet the long-term objectives and expectations in addition to the fact that they affect a company's future financial performance.

The aim of this study is to propose a performance evaluation system, which measures performances based on the level of task completion by staff and reflects the performances directly from the work being accomplished by focusing on the “internal business perspective” component of the balanced scorecard. The rest of the paper is organized as followings. In the second part of the study previous work on performance measurement is reviewed. In the third part, the methodological scope of the study is provided. The results of the study and the associated findings are presented in the fourth part. The final section concludes the study with some discussions.

## **2. METHODOLOGY**

The methodology of this study was developed based on the “internal business perspective” dimension of the balanced scorecard approach. This study aims at measuring the operations-based performance of employees of a bank that provides services in Turkey, according to their operational activities that were formed by the new banking law and legislation. The performances of the operational staff were calculated by taking into account the transaction types and durations of operations on a monthly basis, and different scores were given to the staff according to their performances. Then, the staff were ranked based on those scores and received success rates accordingly. The organizational units, for which this study was conducted, could be able to determine their monthly relative work load through the performance scores pertaining to them. The methodology was built upon quantitative operations-based performance calculations for the goals to be achieved and it was provided in Appendix 1.

### **2.1. Objective and goals**

The main goal is to carry out operations-based performance measurement in all the organizational units of the company and to facilitate an individual-based reporting system. In accordance with that objective, reducing the overall percentage of manually prepared reports to single digit, enabling a more systematic and frequent access to the reporting system, and increasing the average capacity utilization of the staff by ensuring an increased motivation, loyalty and work concentration, are the goals to be achieved.

### **2.2. Performance measures**

Transaction (operation) type and transaction duration parameters were taken into account when measuring the performances: The transaction types were also categorized into two groups; (1) The transaction logs that were processed by information system and made ready for analyses by the business intelligence tools, (2) The transactions that could not be recorded, but directly affect performance of an employee.

The transactions in the second category were recorded via a form template prepared in Microsoft Excel in a way that ensures minimum workload. The stream of work, on which time study was performed, was structured as transactions/sub-transactions. The transactions can be carried out in more than one step to ensure the control of transaction processing (e.g.,

entry and confirmation). The steps needed to measure the durations of transactions and the formula regarding the total duration can be written as follows:

*Transaction duration:* Time for investigating the transaction paperwork (a) + Time for processing the transaction log (b) + Time for necessary operations after confirmation of the transaction (c)

In the above-mentioned formula, time (a) and (c) might vary according to the type of transaction. The transaction duration can be recorded in second/minutes/hours. There are hundreds of transactions that were carried out by the organizational units, therefore identifying the most common transactions and performing a time study for those operations were reasonable actions for efficient resource and time allocation. The first 90% of the transactions that are based on the calculations below were selected when determining transaction sets, on which time studies were conducted:

*Number of total transactions:* Entry transactions + Confirmation transactions

*Total transaction duration (min):* Total confirmation time + Total processing time

For the time studies that were carried out, the number of measurements for transaction duration and number of staff, for whom the measurement took place, as well as performance calculation method, are presented below.

*Number of Measurements for Transaction Duration:* The number of measurements for an organizational unit depends on the workload that the pertaining transaction creates in the unit. More workload means that more measurements are needed. Minimum 4 measurements were carried out while in some occasions the number of measurements has reached 120.

*Number of Staff:* The measurements were performed on the corresponding staff who have working experience of one or more years.

*Performance Calculation Method:* When calculating individual performances, an assumption of 6.5 hours of daily working time was made. By this assumption, someone who works for 6.5 hours daily under normal conditions is regarded as working at full capacity. For someone to go over 100% of his or her performance, s/he needs to either finish the tasks quicker than the corresponding normal times or has to work overtime. In both cases, the person completes more tasks. It should be also noted that such manual task entries might be open to manipulations since the data recording is performed by the person or his/her superior.

*Individual Average Daily Performance, Full-time Equivalent (FTE):* Total monthly number of transactions \* Total transaction duration (min) / 390 min (or 6.5 hours) / Total number of attendance days of the individual

The variety in durations depending on the transaction type cannot be considered as an indication with regards to the complexity or simplicity of a transaction. In other words, the short transaction duration does not necessarily show that the transaction is simple or vice

versa. The transactions within an organizational unit must be equally assigned to the staff in order to obtain reliable performance results. Also, the random assignment of the transactions carried out by the information system to the staff increases the reliability of the performance system and reduces the requirement of any other indicator apart from the measurement of FTE.

*Capacity Utilization Rate (CUR):* This indicates the total workforce utilization capacity in a certain period and can be calculated as the division of FTE by total number of staff. The direction and magnitude of changes in CUR denote the change in performance. For instance, if high changes caused by seasonal workloads (%10-20) condense on certain employees, then additional staff requirement might be of need.

### **2.3. Methods and tools**

In this study, data warehouse and dashboard applications of Microstrategy were utilized as business intelligence tools. Apart from the operational transactions, the personnel records also needed to be updated, and the integration between those must be ensured. In order to achieve that, the data marts were linked to each other via a data field that includes personal identification code. The data in the data warehouse were made ready for reporting and accessible to the system users via a dashboard application. The dashboard application was designed for the users (the personnel and their superiors), and it enables them to monitor individual performances on monthly and historical bases. Also, by means of the application, the superiors can compare the performances of the staff working in the same organizational unit. The methodology has the following steps:

- The data marts of the data warehouse were replicated in a separate database of Microstrategy.
- Metric and Attribute identification of the data fields in the data warehouse suitable for Microstrategy was performed.
- Excel/Pdf/Word compatible reporting mechanisms based on the attributes and the metrics were ensured via a user interface.
- A dynamic dashboard application was designed and made accessible to the users.

### **2.4. Outputs and gains**

Through the obtained performance measurement results, it would be possible to put in place an incentive/penalty system, which could be accepted and supported by the staff, and this would ensure an increase on efficiency of the performance for the individuals at different levels.

## **3. ANALYSES AND FINDINGS**

By means of the business intelligence tools, it was possible to conduct data analyses based on the three measurements that were taken into consideration. The results of the analyses are provided in detail in the following sub-sections.

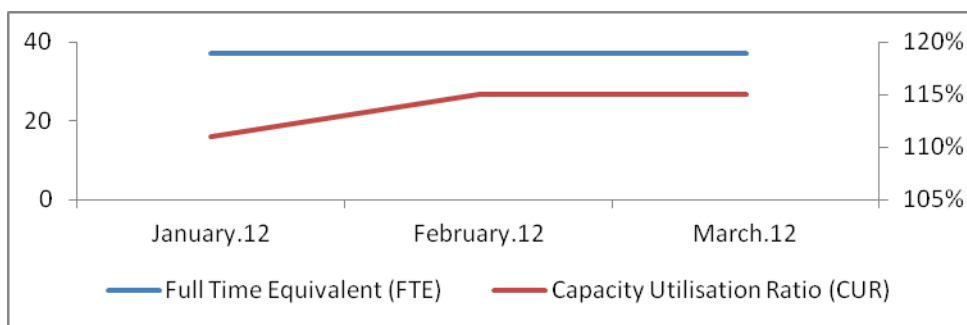
### 3.1. Report frequency

The total workloads and the changes in capacity utilization rates for the organizational units under consideration, as indicated in Figure 1, as well as the report issue frequency, which affect these parameters, could be seen as important impacts of this study. More importantly, the report issue frequency substantially increases the competency on measurability, monitor ability, and time-to-respond, so that it could support the required managerial actions.

### 3.2. Percentage of system-generated reports

The March 2012 performances of the organizational unit B according to staff, affiliations and teams are shown in Figure 2, as a representation of system-generated reports. The table provides knowledge regarding the performance scores of individuals, obtained through their operational activities and the cumulative performance score of the corresponding organizational unit.

Figure-1: Changes in Workloads and Capacity Utilization Rates Per Period



### 3.3. Capacity utilization rate

Due to the operations-based performance measurement infrastructure that had been put in place since January 2012, the incentive/penalty/promotion and mentoring systems were put into practice in February 2012 via taking into account the results of the prior month. Therefore, it is possible to say that the performance increases on capacity utilization rates for organizational units (as presented the table in Appendix 2) were indeed the result of the undertaken actions after the operations-based performance measurement system was in use. According to the table, the CUR of the organizational unit B for February was increased up to 115%, while the same figure was around 111% in January 2012. In fact, it is possible to observe that the changes in the CURs of all organizational units were at peak in February 2012. The changes in the CURs for other periods can also be monitored through the implemented system.

## 4. CONCLUSION AND DISCUSSIONS

The recent literature shows that focusing only on financial performance indicators, when measuring firm performance, may be inadequate in this fierce competitive environment. The

balanced scorecard methodology can be considered as a tool that helps companies to accomplish these. In this study, the long-term operational performance goals for “Internal Business Perspective” of the balanced scorecard model were put in place for a financial institution in Turkey and an operations-based performance methodology was implemented using business intelligence tools. The main gains and outputs of the methodology, as well as the associated requirements, are presented in Table 3.

Table-3: Gains Matrix

<b>Gains</b>	<b>Primary Requirements</b>	<b>Secondary Requirements</b>
Customer satisfaction	Employee loyalty	Operations-based performance measurement system
Improvements in business processes and capacity increase	Operations-based performance measurement system	IT projects at different scales
Determination of core competencies	Productivity increase	Individual-based performance measurement system
Efficient usage of information technologies	Multi-dimensional (financial/non-financial) performance measurement system	Business intelligence system development

After the implementation of the methodology, it could be possible to observe the following outcomes:

- A significant increase on performances of both employees and organizational units.
- An indirect improvement of corresponding business processes.
- Facilitation of an additional capacity on current workloads via the development of mini improvement projects regarding systematic recording of paperwork that was previously carried out manually.
- A more credible incentive/penalty/promotion system by establishing an individual-based performance system that is far from subjectivity.
- An increase on employee loyalty, discipline and motivation.
- An up-to-date and robust performance system, which takes into account non-financial performance indicators.
- An effective managerial decision support mechanism fed by regular and on-time reporting through business intelligence tools.
- A significant reduction on customer waiting times, which results in an increase on customer satisfaction.

In conclusion, the changes in business processes, caused by legal or managerial decisions, effect the durations of the undertaken operations and the performances of staff responsible for these operations. Therefore, acquiring an up-to-date operation completion time and

calculating the performances accordingly have become critically important, especially for companies providing services. Establishing a reliable analytical technology component to monitor the performances, measuring the impact of technology-oriented improvements (both on technical and organizational dimensions) on the performances and making these sustainable could be seen as requirements for competitive advantage.

Figure-2: March 2012 Performance Scores for Organizational Unit B

TEAM	USERNAME	TITLE	TRANSACTION ENTRY NO	ENTRY FULL TIME EQUIVALENT (FTE)	TRANSACTION APPROVAL NO	APPROVAL FULL TIME EQUIVALENT (FTE)	TOTAL FULL TIME EQUIVALENT (FTE)
TEAM 1	USER 1	TITLE 1	2,096	0,51	-	-	0,51
	USER 2	TITLE 3	380	0,17	555	0,06	0,23
	USER 3	TITLE 3	2,226	0,25	6,741	0,82	1,07
	USER 4	TITLE 2	695	0,08	4,638	0,64	0,72
	USER 5	TITLE 1	5,992	1,23	-	-	1,23
	USER 6	TITLE 1	3,683	0,98	-	-	0,98
	USER 7	TITLE 2	720	0,07	3,546	0,46	0,53
	USER 8	TITLE 1	4,265	1,18	-	-	1,18
	USER 9	TITLE 1	4,755	1,40	-	-	1,40
<b>TEAM 1 TOTAL</b>			24,812	5,87	15,480	1,98	7,85
TEAM 2	USER 10	TITLE 2	838	0,23	568	0,75	0,98
	USER 11	TITLE 3	173	0,08	250	0,28	0,36
	USER 12	TITLE 1	771	0,46	31	0,02	0,48
	USER 13	TITLE 3	422	0,11	395	0,21	0,32
	USER 14	TITLE 2	920	0,55	223	0,21	0,76
	USER 15	TITLE 2	1,157	1,17	85	0,09	1,26
	USER 16	TITLE 2	524	0,17	649	0,84	1,01
	USER 17	TITLE 1	920	0,93	29	0,04	0,97
	USER 18	TITLE 2	1,232	1,09	59	0,06	1,15
	USER 19	TITLE 3	41	0,01	52	0,10	0,11
	USER 20	TITLE 2	553	0,30	513	0,48	0,78
	USER 21	TITLE 2	1,258	1,03	40	0,04	1,07
	USER 22	TITLE 3	189	0,06	554	0,41	0,47
	USER 23	TITLE 1	1,008	1,03	49	0,06	1,09
	USER 24	TITLE 2	1,077	0,56	92	0,15	0,71
	USER 25	TITLE 2	819	0,22	514	0,78	1,00
	USER 26	TITLE 1	1,087	1,02	48	0,05	1,07
	USER 27	TITLE 2	865	0,73	525	0,67	1,40
	USER 28	TITLE 2	835	0,13	486	0,67	0,80
	USER 29	TITLE 2	542	0,19	434	0,67	0,86
	USER 30	TITLE 3	299	0,08	403	0,57	0,65
	USER 31	TITLE 2	1,943	1,71	452	0,40	2,11
	USER 32	TITLE 3	1,354	0,17	322	0,19	0,36
	USER 33	TITLE 2	716	0,67	110	0,12	0,79
<b>TEAM 2 TOTAL</b>			19,543	12,70	6,883	7,86	20,56
<b>GRAND TOTAL</b>			44,355	18,57	22,363	9,84	28,41

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## Appendix-1: Performance Management Indicators for Internal Business Perspective

Objectives	Goals	Measurements	Tools/Methods	Outputs/Gains
Performing operations-based performance measurement and enabling individual-based reporting system	Establishing an infrastructure that facilitate 90% of the reports to be generated through the system	Percentage of system-generated reports	Establishing related data marts in the enterprise data warehouse and ensuring data quality and integrity	Determination of factors for incentive/penalty/promotion through performance scores, designation of performance goals, and mentoring the staff
	Reducing report issue frequency to one month	Report issue frequency	Integrating the data necessary for reporting on a monthly basis through the operational systems	
	Increasing the average capacity utilization to %95	Capacity utilization rate	Ensuring self-made performance monitoring for the staff via preparation and dissemination of Dashboard applications	

## Appendix-2: Table-2: Changes in Capacity Utilization Rates for Organizational Units

Period	CUR Changes					
	Organizational Unit A	Organizational Unit A	Organizational Unit B	Organizational Unit B	Organizational Unit C	Organizational Unit C
	Real	Change	Real	Change	Real	Change
Jan 2012	80.6%	-	111.3%	-	91.5%	-
Feb 2012	81.9%	1.3%	115.1%	4.2%	94.5%	3%
March 2012	83.4%	1.5%	115.1%	0%	96.1%	1.6%

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