Financial Performance Evaluation of Turkish Construction Companies in Istanbul Stock Exchange (BIST)

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Abstract

Financial performance evaluation of construction companies is a kind of multi-criteria decision making (MCDM) problem. The decision makers need a wide range of performance indicators in order to ensure that appropriate decisions can be made. The aim of this study is to evaluate the financial performance of Turkish construction companies whose shares are publicly traded in Istanbul Stock Exchange (Borsa Istanbul-BIST) during 2012-2015 period using multi criteria decision techniques. For this purpose, Grey Relations Analysis and Analytical Network Process were used in examining the data related to these companies. This model is applied to a case study for the financial performance evaluation of 7 construction companies (Anel, EDİP, Enka, Kuyumcukent, ORGE, SAN-EL, Yeşil Yapı) in Turkey. Financial performance indicators namely Asset Growth Rate, Operating Costs/Net Sales, Return on Asset, Net Profit Margin, Return on Equity, Current Ratio, Long Term Assets/Total Assets and Quick Ratio are used for ranking the firms. The findings of this paper would demonstrate the financial performance of the Turkish construction companies and would help construction companies' managers and investors to evaluate the performance of each company and compare it with their competitors'.

Key words Construction Companies, BIST, Financial Performance Evaluation, Analytical Network Process (ANP), Grey Relations Analysis (GRA), Multi Criteria Decision Making (MCDM)

1. Introduction

Construction sector has been playing an important role in Turkey since 1950's, when wide-scale urbanization started as a result of rapid industrialization. As one of the G-20 countries, the construction sector has been one of the leading sectors in Turkey's developing process.

According to the construction sector report by Turkish Employers' Association of Construction Industries, (March 2014), the construction sector and other sectors serving to construction sector have a share of approximately 30% in the Gross National Product of Turkey. This fact clearly indicates the role of construction sector's role in the Turkish economy. The same report cites that the "Engineering News Record (ENR) Journal", one of the leading publications in contractor sector, reveal that there are 38 Turkish construction companies in the list of 250 biggest construction companies in the world in 2013. The total revenue of these 38 companies was 16.3 billion US dollars.

According to the monthly sectoral report published by the Association of Turkish Construction Material Producers (IMSAD), total construction expenditures are 122.2 billion TL in first three quarters of 2014. Private sector construction expenditures are 72.3 billion TL in the first three quarters of 2014. Construction sector employment is over 2 million in October (IMSAD, 2015).

Instead of the fact that the construction sector is a leading sector in Turkish economy, there are only 10 construction companies whose shares are publicly traded in Istanbul Stock Exchange (BIST Istanbul). These are listed on Table 1.

Table 1. Construction Companies Traded in Istanbul Stock Exchange (BIST)

	CODE	COMPANY NAME
1	ANELE	Anel Elektrik Proje Taahhüt ve Ticaret A.Ş.
2	EDIP	EDİP Gayrimenkul Yatırım Sanayi ve Ticaret A.Ş.
3	ENKAI	Enka İnşaat ve Sanayi A.Ş.
4	KUYAS	Kuyumcukent Gayrimenkul Yatırımları A.Ş.
5	ORGE	ORGE Enerji Elektrik Taahhüt A.Ş.
6	SANEL	SAN-EL Mühendislik Elektrik Taahhüt Sanayi ve Ticaret A.Ş.
7	TURGG	Türker Proje Gayrimenkul ve Yatırım Geliştirme A.Ş
8	YAYLA	Yayla Enerji Üretim Turizm ve İnşaat Ticaret A.Ş.
9	YDATH	YDA İnşaat Sanayi ve Ticaret A.Ş.
10	YYAPI	Yeşil Yapı Endüstrisi Anonim Şirketi

Table 2 provides general information for 7 Turkish construction companies in BIST (2015 3rd Quarter). This study deals with 7 companies, 3 companies are omitted because of lack of data.

Table 2. General Information of Construction Companies in BIST (2015 3rd Quarter)

Name of Company	Registered Capital (TRY)	Paid in Capital (TRY)	Number of Outstanding Shares	Total Assets (TRY)	Stock Price (TRY)	Market Value (TRY)
1. Anel Elektrik Proje Taahhüt ve Ticaret A.Ş. (ANELE)	200,000,000	110,000,000	110,000,000	1,134,504,303	1.16	127,600,000
2. EDİP Gayrimenkul Yatırım Sanayi ve Ticaret A.Ş. (EDIP)	65,000,000	65,000,000	6,500,000,000	504,928,951	0.72	4,680,000,000
3. Enka İnşaat ve Sanayi A.Ş. (ENKAI)	4,000,000,000	4,000,000,000	400,000,000,000	22,288,741,000	4.93	1,972,868,217,054
4. Kuyumcukent Gayrimenkul Yatırımları A.Ş. (KUYAS)	100,000,000	9,072,933	100,000,000	187,598,419	2.84	283,535,437
5. ORGE Enerji Elektrik Taahhüt A.Ş. (ORGE)	50,000,000	20,000,000	20,000,000	65.502.762	2.00	40,000,000
6. SAN-EL Mühendislik Elektrik Taahhüt Sanayi ve Ticaret A.Ş. (SANEL)	50,000,000	13,225,000	13,225,000	39,758,640	1.82	24,069,500
7. Yeşil Yapı Endüstrisi Anonim Şirketi (YYAPI)	500,000,000	232,707,815	232,707,815	660,991,042	0.75	174,530,861

Note: 1 USD is equal to 3.0351; Indicative Exchange Rates Announced on 09/30/2015 by the Central Bank of Turkey

2. Literature Review

In the financial performance literature, many studies were made on determining the relationships among the financial measures and the effects of these measures on the performance of companies. In the literature, there are a large number of performance evaluation methods and researches. The financial function plays a significant role in ensuring that company objectives are compatible with its resources and financial information usually serves as the basic instrument of strategic analysis, thus, through the use of published financial data, analysis of the behaviour and competence of rival firms within the industry can be performed leading to judgements relating to a company's relative competitive position (Edum-Fotwe *et al.*, 1996).

Lewellen (2004) studied whether financial ratios like dividend yield can predict aggregate stock returns. This study revealed that predictive regressions are subject to small-sample biases, but the correction used by prior studies can substantially understate forecasting power. Yalcin *et al.* (2012) applied fuzzy multi-criteria decision making methods for financial performance evaluation of Turkish manufacturing industries; two MCDM methods TOPSIS (Technique for Order Preference by Similarity to Ideal Solution

Methods) and VIKOR based on an aggregating function representing closeness to the reference point(s) have been used for ranking the companies in their own manufacturing sector comparatively. Bulgurcu (2012) analyzed financial performance of technology firms in Istanbul Stock Exchange by using TOPSIS Technique. This study examined and assessed these firms in terms of ten financial ratios which are combined to obtain a financial performance score by using TOPSIS and this study will find out whether the ranking results of TOPSIS and the ranking results of the firms' market values in question overlap or not.

Ocal *et al.* (2007) made factor analysis with industry financial ratios in Turkish construction industry using five independent factors, i.e. liquidity, capital structure and profitability, activity efficiency, profit margin and growth, and assets structure, which were identified to be sensitive to the economic changes in the country. Wang Yu-Jie (2009), combined grey relation analysis with fuzzy multi-criteria group decision-making (FMCGDM) to evaluate financial performance of Taiwan container lines. In the evaluating process, he applied grey relation analysis to partition financial ratios into several clusters, and find representative indices from the clusters. These representative indices are considered as evaluation criteria on financial performance assessments. Then an FMCGDM method is utilized to evaluate the financial performance of Taiwan container lines.

Yu *et al*. (2007) developed an implementation model and practical methodology to measure and compare the performance of construction companies by making thorough qualitative and quantitative analysis, which was used to develop a set of indicators for performance measurement, and an analysis of the relative weightings of the indicators was carried out. Then they calculated the performance score of construction companies using a study of 34 Korean construction companies and finally, they carried out a performance evaluation and system analysis using the calculated performance scores and identified practical issues for the implementation of their performance measurement system.

Chan *et al.* (2005), analyzed construction firms in Hong Kong to review their past financial performance and to formulate new strategies for their business survival in the coming years. Li *et al.* (2005) examined the reasons for success of public–private partnerships (PPPs), which are increasingly used in the United Kingdom's public facilities and services provision through the Private Finance Initiative (PFI). They used a questionnaire survey research that examined the relative importance of 18 potential critical success factors (CSF) for PPP/PFI construction projects in the UK.

3. Methodology of research

The aim of this study is to evaluate the financial performance model of Turkish Construction Companies using multi criteria decision techniques. To achieve this objective, financial ratios of 7 construction companies are employed for the period from 2012 1st quarter to 2015 3rd quarter. This study gathers firm-specific fundamental variables of 7 construction companies (Anel Elektrik Proje Taahhüt ve Ticaret A.Ş., EDİP Gayrimenkul Yatırım Sanayi ve Ticaret A.Ş., Enka İnşaat ve Sanayi A.Ş., Kuyumcukent Gayrimenkul Yatırımları A.Ş., ORGE Enerji Elektrik Taahhüt A.Ş., SAN-EL Mühendislik Elektrik Taahhüt Sanayi ve Ticaret A.Ş., Yeşil Yapı Endüstrisi Anonim Şirketi). Of the 10 construction companies whose shares are publicly traded in the Istanbul Stock Exchange, 3 were omitted because of lack of sufficient information. Table 3 shows the details of variables in the decision model.

Table 3. Variables in the Decision Model and Their Terminology

Firm-Specific Variables	Terminology
C1: Asset Growth Rate %	(Total Assets$_t$ – Total Assets$_{t-1}$)/Total Assets$_{t-1}$
C2: Operating Costs/Net Sales %	(Operating Costs)/(Net Sales)
C3: Return on Asset %	(Net Income)/(Total Assets)
C4: Net Profit Margin %	(Net Income)/(Net Sales)
C5: Return on Equity %	(Net Income)/(Shareholders' Equity)
C6: Current Ratio	(Current Assets)/(Short-term Liabilities)
C7: Long-term Assets/Total Assets %	(Long-term Assets)/(Total Assets)
C8: Quick Ratio	(Current Assets-Inventories)/(Short-term Liabilities

In this part of the study, Analytic Network Process and GRA methods will be briefly given.

3.1. Analytical Network Process

ANP proposed by T. L. Saaty (Saaty, 1996) is a general form of the Analytic Hierarchy Process (AHP). ANP is one of the multi criteria decision making techniques which consider the dependence among criteria and alternative. Therefore it offers several advantages over other MCDM techniques. There are mainly six steps in ANP.

    I. Define decision problem,
    II. Determine dependencies among clusters (outer dependence) and elements of the clusters (inner dependence),
    III. Pairwise comparisons of the elements and clusters,
    IV. Determine the supermatrix and weighted supermatrix,
    V. Calculate the limit supermatrix,
    VI. Select the best alternative.

3.2. Grey Relational Analysis

Grey Relational Analysis (GRA) is an evaluation method that finds the degree of similarity or difference between two sequences using the grade of relation (Deng, 1989).There are mainly six steps in Grey Relational Analysis for outranking and compare the alternatives (Wu 2002):

    I. Preparing data set and construct decision matrix,
    II. Constructing reference series and compare matrix,
    III. Normalization process and constructing normalization matrix,
    IV. Constructing absolute values table,
    V. Calculating the grey relational coefficient for each alternative,
    VI. Calculating the grey relational degree.

4. Findings and discussions

The proposed model of this paper uses a combined method of Analytical Network Process and Grey Relational Analysis for ranking the Turkish construction companies traded in Istanbul Stock Exchange (BIST) depends on their financial performances. ANP was used in order to determine the precedence order of financial ratios namely Asset Growth Rate, Operating Costs/Net Sales, Return on Asset, Net Profit Margin, Return on Equity, Current Ratio, Long Term Assets/Total Assets and Quick Ratio (Önder *et al.*, 2014). Subjective and objective opinions of finance experts turn into quantitative form with ANP. GRA technique is used for calculating the ranks (financial performance) of seven Turkish construction companies traded in Istanbul Stock Exchange (BIST) during 2012-2015 period.

The outputs of the ANP are determined as the input of GRA method. Data are used for the period 2012 to 2015 (15 quarters). The sample period is dependent on quarterly data availability. The sample includes seven construction companies (Anel Elektrik Proje Taahhüt ve Ticaret A.Ş., EDİP Gayrimenkul Yatırım Sanayi ve Ticaret A.Ş., Enka İnşaat ve Sanayi A.Ş., Kuyumcukent Gayrimenkul Yatırımları A.Ş., ORGE Enerji Elektrik Taahhüt A.Ş., SAN-EL Mühendislik Elektrik Taahhüt Sanayi ve Ticaret A.Ş., Yeşil Yapı Endüstrisi Anonim Şirketi). The data is obtained from Public Disclosure Platform (PDP), which is an electronic system through which electronically signed notifications required by the capital markets and Borsa Istanbul regulations are publicly disclosed, including the financial statements.

In this study, financial ratios' priority weights taken from Önder *et al.* (2014)'s paper. In that paper, researchers used Analytical Network Process (ANP) to determine the weights of financial ratios for evaluating the financial performance model of Turkish Real Estate Investment Trusts (REITs) during 2012-2013 period. According to finance expert's judgments based ANP analysis, "Return on Equity" (0.2389) was the most important criteria influencing companies' financial performance followed by "Net Profit Margin" (0.2199) and "Return on Asset" (0.2055). The least important priorities are "Quick Ratio" (0.0194), "Current Ratio" (0.0272) and "Operating Costs/Net Sales" (0.0430). Resulting weights obtained with expert judgments based ANP are shown on Figure 1.
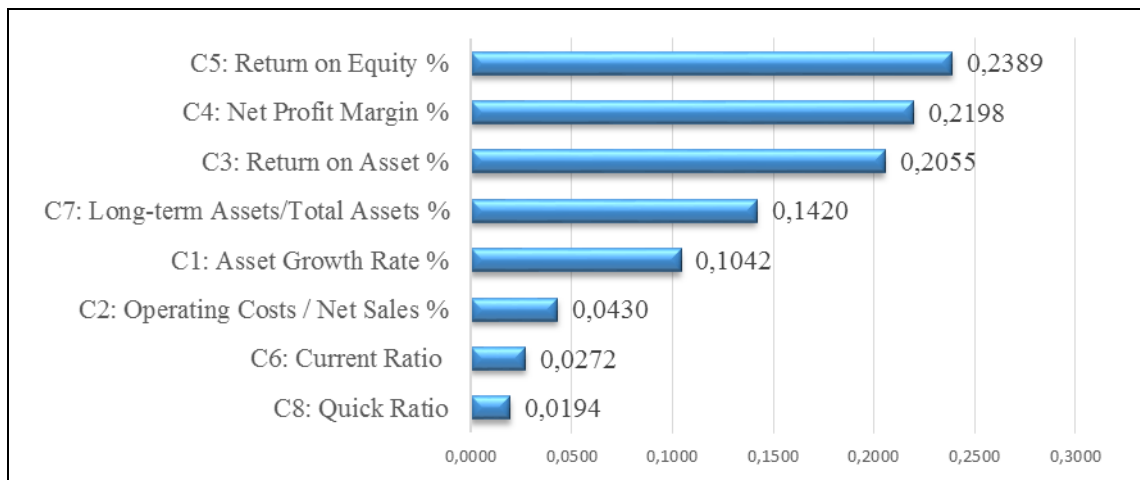
Figure 1. Resulting weights of financial ratios (criteria) obtained with expert judgments

Finally, GRA method is applied to rank the construction companies. The results are shown on Tables 4 and 5.

Table 4. Results of grey relational coefficient

	2012-3	2012-6	2012-9	2012-12	2013-3	2013-6	2013-9	2013-12	2014-3	2014-6	2014-9	2014-12	2015-3	2015-6	2015-9
ANELE	0,475	0,544	0,564	0,449	0,422	0,710	0,665	0,642	0,575	0,547	0,601	0,549	0,567	0,456	0,531
EDIP	0,610	0,686	0,738	0,732	0,547	0,504	0,376	0,460	0,420	0,601	0,585	0,848	0,466	0,364	0,361
ENKAI	0,556	0,613	0,660	0,586	0,520	0,810	0,827	0,828	0,824	0,775	0,812	0,739	0,799	0,560	0,658
KUYAS	0,423	0,475	0,469	0,381	0,372	0,593	0,558	0,766	0,706	0,453	0,420	0,514	0,576	0,480	0,540
ORGE	0,570	0,583	0,563	0,493	0,531	0,741	0,759	0,692	0,862	0,815	0,829	0,677	0,809	0,601	0,728
SANEL	0,759	0,746	0,773	0,634	0,571	0,800	0,821	0,836	0,606	0,732	0,759	0,631	0,520	0,391	0,476
YYAPI	0,355	0,335	0,403	0,512	0,667	0,507	0,595	0,483	0,420	0,477	0,439	0,412	0,418	0,915	0,879

Table 5. Ranking of Construction Companies Using GRA

Firms	2012-3	2012-6	2012-9	2012-12	2013-3	2013-6	2013-9	2013-12	2014-3	2014-6	2014-9	2014-12	2015-3	2015-6	2015-9
ANELE	5	5	4	6	6	4	4	5	5	5	4	5	4	5	5
EDIP	2	2	2	1	3	7	7	7	7	4	5	1	6	7	7
ENKAI	4	3	3	3	5	1	1	2	2	2	2	2	2	3	3
KUYAS	6	6	6	7	7	5	6	3	3	7	7	6	3	4	4
ORGE	3	4	5	5	4	3	3	4	1	1	1	3	1	2	2
SANEL	1	1	1	2	2	2	2	1	4	3	3	4	5	6	6
YYAPI	7	7	7	4	1	6	5	6	6	6	6	7	7	1	1

5. Conclusions

Financial ratios provide useful quantitative financial information to users of financial information, especially to investors and financial analysts. They enable the stakeholders to evaluate the success and financial position of a company and analyze its position within a sector over time. This study puts forth an analysis for the financial performance evaluation of the seven listed construction companies in the Istanbul Stock Exchange whose effective and productive performance is measured by using financial ratios.

In this study analytic network process (ANP) was used to structure network and identify dependence among financial ratios. The proposed methodology can also be applied to any other financial performance evaluation problem involving multiple and conflicting financial indicators. Financial performance evaluation can also be done using other MCDM techniques including TOPSIS, MOORA, PROMETHEE, VIKOR, ELECTRE etc. for comparing the results. Extensions of the MCDM techniques can be used for ranking under fuzzy

environment. Future researches regarding ranking of companies may attempt to seek all construction companies in Istanbul Stock Exchange (BIST) with the help of more finance and investment experts.

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