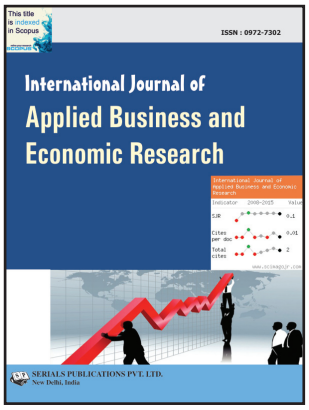

International Journal of Applied Business and Economic Research

ISSN : 0972-7302

available at http: www.serialsjournal.com

Volume 15 • Number 5 • 2017

Comprehensive Model for School Ranking

Case Study: Urban High Schools in Qazvin, Iran

Behnaz Mohajeran[1], Alireza Ghale'ei[2] and Eynollah Rahmani[3]

[1-2]*Faculty of Literature and Humanities, Urmia University, Urmia, Iran*

[3]*Corresponding author: Faculty of Literature and Humanities, Urmia University, Urmia, Iran*

ABSTRACT

The major emphasis of existing school ranking procedures on the main indices such as the rate of students' success in examinations, etc is their major problems. Due to the lack of comprehensive index, this research seeks to solve this problem by providing a comprehensive model for school ranking.

This study is applied in terms of objective and post-event (causal-comparative) according to the nature. It has survey method in terms of data collection in order to determine the dimensions of performance evaluation and uses the Delphi method and has the descriptive-mathematical type in school ranking. The data collection method has library-field method in this research. The statistical population of this research consists of all normal-natural sciences high schools in Qazvin province.

The proposed model for school ranking consists of two parts, descriptive (30 indices) and mathematical (TOPSIS and Data envelopment analysis).This model utilizes a developed Balanced Scorecard model. In the descriptive dimension, this model consists of five main components: financial, internal processes, management, development and learning, and customer orientation. Its 5 indices belong to the financial component, 4 indices to internal component, 5 indices to management component, 7 indices to development and learning, and 9 indices to customer orientation.

Keywords: Performance evaluation, balanced scorecard, Data envelopment analysis (DEA), Shannon entropy, Topsis, confirmatory factor analysis

1. INTRODUCTION

The performance and evaluation are considered in all organizations and institutions and the education system is one of these important organizations in any country as the development of education sector is

a prerequisite for development of each country; and the need to evaluate the performance and improve the efficiency are particularly important at schools as the main educational institution. In this regard, it is essential to evaluate the performance of second-period high schools.

School ranking is one of the most important tools of determining the strengths, weaknesses, performance weakness, and identification of external opportunities and threats at schools. Ranking the second-period schools based on the performance evaluation significantly helps the future public and private finance and governmental decision-making for support, intervention, punishment, or encouragement and guidance of high schools. This improves the guidance and performance in school principals and all authorities. Comparison of high schools has a great help to develop the appropriate strategies based on the capabilities of those schools. To reach the maximum efficiency and activity, the high school principals select the appropriate scale for their activities to compete with rivals. The major problems of existing ranking methods include their main emphasis on a key index such as the students' rate of success in June exams or the number of those who have be accepted at daily state universities, etc.Due to the lack of comprehensive indices and the non-proportionality between the results of performance evaluation at schools and the existing model in performance evaluation (organizational excellence model) and the output of these schools based on the results of domestic studies by Rahmani (2013), Dadkhah et. al., (2013), Aramesh et. al., (2014) and Ahmadi (2013), this research seeks to solve this problem by providing a comprehensive model for performance-based ranking in education with an integrated approach: It is a case study of natural science high schools and is implemented with the aim of enhancing the efficiency of natural science high schools.

The applied objectives of integrated model presented in performance evaluation of natural science high schools are as follows:

- Comprehensive assessment of natural science high schools (urban) in the whole country and ranking them;
- Ability to analyze and revise the policies and programs for high schools by staff managers and principals in order to create the infrastructures for performance improvement at schools.
- Taking the advantage of proposed model by school officials to try to change the high school rank.

The following stages are done for conducting this research:

1. Identifying the components of balanced scorecard method using the field method (implementing the questionnaire with open-response questions and examining the documents and analyzing their contents) in order to identify the stakeholders' expectations at natural-science high schools and utilizing the research literature and background;
2. Classifying these expectations and results obtained from the research literature as the indices in the form of balanced scorecard components;
3. Developing and designing the questionnaire for determining the importance and impact of performance evaluation indices at natural science high schools;
4. Weighting the indices by Shannon entropy weighting technique and investigating the effect of studied variables using the structural equation (LISREL);
5. Collecting the data of conceptual model and determining the efficiency of schools;
6. Ranking the schools through TOPSIS.

The main objective of this paper is to provide the components and indices of integrated model in order to evaluate the performance of natural science high schools (urban) in Qazvin province. The sub-objectives of this research include the identification of five factors (financial, internal processes, management, development and learning, customer-orientation) based on the balanced scorecard approach in performance evaluation of normal schools (urban, state) in Qazvin Province as well as identification of efficient and inefficient units based on the data envelopment analysis (DEA), and ranking the natural high schools (urban) in Qazvin province based on the Topsis ranking technique. Therefore, the next section of this paper outlines the research background and questions. The research method will be presented in the third section. The fourth section represents the results of research hypotheses and the fifth section indicates the results of practical test for proposed model in a number of high schools in Qazvin Province. The sixth section of article describes the conclusion and suggestions.

2. RESEARCH BACKGROUND

2.1. Research Literature

The organizational performance is to accomplish the tasks which are assigned by the organization to human resources. The organizational performance nearly includes all objectives of competitiveness and excellence of production and is associated to the cost, flexibility, speed, reliability or quality. Furthermore, the organizational performance can be defined as an umbrella which contains all concepts of success and activities in the whole organization (Ghorbanizadeh et. al., 2012, p. 140).The performance is one of the fundamental concepts of management as most of the tasks are created on this basis. In other words, the success of organizations can be seen in their performance. If "performance" term (as the origin of the English word), we can attribute anything which reflects the activity in a person, entity or organization (Olia, p. 2010).

Any performance evaluation process includes a set of activities and measures with specific, logical and purposeful sequences. The consideration of stages and observing the orders of following activities are essential in performance evaluation process regardless of the type of selected model:

1. Developing the indices and relevant dimensions and axes and determining their measurement units;
2. Weighting the indices in terms of their importance and the limit of relevant rates;
3. Standardizing and determining the desired status of each index;
4. Notifying the "evaluated person" of expectations and indices;
5. Evaluation and assessment by comparing the real performance at the end of evaluation period with the appropriate standard;
6. Extraction and analysis of results. (Rahimi, 2006, p. 36)

The performance evaluation criteria investigate the outputs of any activity compared to its inputs and establish the input-output ratio. The performance evaluation criteria focus on the results of each activity and evaluate the proper movement of any activity towards the defined and certain targets. The performance evaluation indices are quantitative and objective and based on the statistics and classified into

two main categories: (a) productivity indices, and (b) performance indices. Using the productivity indices, we can apply the management control of activities in an industry, while the performance indices provide the operational control of industrial activities. These indicators can indicate the level of technology in an industry individually or in combination with each other. Prioritization and weighting are very important to combine the indices, and thus we should utilize the suitable methods. Furthermore, there should also be accurate and sufficient information in this regard (Mehrgan et. al., 2008, p. 37).

2.2. Background of Conducted Studies in this Field

A. Domestic Studies

In a study entitled "The evaluation of higher education institutions by the balanced scorecard (BSC) and multi-criteria decision-making methods (MCDM)" and with the aim of developing a model in the form of balanced scorecard and MCDM methods to assess the universities and non-profit higher education institutions, Ahmadi (2011) has considered the stakeholders' increased satisfaction and developed four dimensions within the organization effective in this regard.

Dadkhah et. al., (2013) have designed a strategic map for private research institutes based on the balanced scorecard model. Therefore, 30 indices are selected for inclusion in the map after analyzing the collected questionnaires by *t*-test and are inferentially designed (due to the lack of similar samples) in education and research field.

In an article entitled "The Schools' Performance Evaluation by BSC and IDEA", Rahmani (2013) could provide an applied model for ranking, planning and improving the performance of schools in an applied-analytical research.

In a book (research project) entitled "The Evaluation of Efficiency and school ranking by DEA and AHP Techniques", Aramesh et. al., (2014) have ranked 18 second-period high schools during the school year of 2012-13 andidentified the efficient and inefficient units.

B. Foreign Studies

Avkiran (2001) has evaluated the efficiency of schools through comparing different methods using the same data. This study, which uses two methods based on the measurement of COLS errors and data envelopment analysis, indicates the inefficiency of schools in twelve input-output groups with non-linear relationship.

In a research entitled "Strategy of concentrated schools; An implementation of the balanced scorecard in provision of educational services", Yuksel & Coskun (2013) have argued that the balanced scorecard can be led to more effectiveness of schools as a method for evaluating the performance and applied technique by public and non-profit centers and as a useful tool in terms of inputs, processes and outputs in implementing the pioneering strategies for these components.

3. RESEARCH METHOD

This study is applied in terms of objective and post-event (causal-comparative) in terms of nature. The primary population of this research consists of all normal natural-science high schools in Qazvin city. Using the multi-stage cluster sampling, the key stakeholders' expectations including 177 high school students,

teachers, administrators, parents and experts are obtained by open-response interviews with two questions and content analysis of answers with a balanced scorecard approach. Afterwards, a researcher-made questionnaire in the form of balanced scorecard approach is responded through the group of experts and managers and according to the stakeholders' expectations and research literature indices.

Using the survey method (researcher-made questionnaire) with the exploratory nature and consisting of 30 questions, the data is collected about the importance and impact of indices in evaluating the performance of natural science high schools in Qazvin province. The questionnaire respondents include five groups, the experts (academics in educational sciences and its branches), senior managers (CEO and deputies), middle managers (education managers in fourteen districts of provincial education), performance evaluation experts in general office and regions, and the experts and authorities in general education office in Qazvin province.

The census method is applied in sampling in response to a questionnaire for determining the importance and impact of school performance indices. The target subjects of this questionnaire are mentioned in Table 34.1.

Table 34.1
The sample respondents of questionnaire for determining the performance evaluation indices of natural science high schools in Qazvin Province (Deputy of Research, Planning and Human Resources, Department of Education in Qazvin Province)

Name or group of subjects	*No.*
General manager	1
General manager deputies	5
Managers in 14 districts	14
Deputies in 14 districts	46
Managers in circles of office	10
Performance evaluation experts in office and districts	14+5
Academics in different fields of educational sciences with Ph.D. degrees in this province	16
Sum	106

In this study, 30 indices in five approaches received the highest scores in performance evaluation of natural science high schools by BSC through the documentary method in research literature (library resources, articles, and electronic sources), individual interviews with educational experts and open-response survey from all stakeholders at a high school (manager, student, parents, teachers, and educational experts) and analyzing the content of these indices. The management component is separated from the internal process due to the high score in research literature and according to the stakeholders' views, and thus considered independently. These indices are as the indices of 5-approach generalized model of scorecard in evaluating the performance of natural science high schools.

The inputs and outputs of this model are identified after determining the performance evaluation indices based on the components of balanced scorecard and its generalization to 5 components, 30 indices, and 14 targets. In this basis, 11 indices are considered as the outputs and 19 ones as the inputs of this model. The presented model for determining the efficiency of units is a return model with the constant scale and Anderson-Peterson type with the input-based approach, and thus the inputs and outputs are identified.

Table 34.2
Input and output indices

Input indices	*Output indices*
Receiving the cash donations by people and donors	The percentage of students who have received the average score of 16 or higher in final exams
The rates of other people's revenues	The percentage of students who go to daily state universities (compared to the graduates)
Space allocation and thematic classes	The students' satisfaction with school staff appropriate behavior
The existence of office and educational supplies	The students' satisfaction with educational and research facilities at school
Reducing the cost of energy, communications of space repairs, and consumed equipment and materials	The students' satisfaction with the quality of extracurricular classes
Proportion of courses with teacher's field of study	The students' satisfaction with teacher's teaching method
The use of active and participatory teaching method	Providing the educational counseling and training to students
The use of continuous and final assessment	Popularity of school in students' enrollment
Performance evaluation of staff by school authorities	Achieving the scientific and educational success
Direct supervision, regulation and timely close of offices	Quick speed of solving the personnel problems
Creating the innovative and creative techniques and ways	Division of labor with regard to the job descriptions of subset
Appropriate response to students' needs and expectations	
School staff partnership with council of teachers	
Familiarity with the rights: The employees and teachers' knowledge about their rights and duties	
Facilitating and developing the teachers' working conditions	
Creating the culture of respecting the teacher among the students	
Creating the necessary conditions for employees' job promotion	
School staff e-learning rates	
School staff mutual satisfaction with each other	

For implementation of proposed model in ranking the second-period natural science high schools, we have considered the schools which taught the human sciences, natural sciences, and mathematics. The attached natural science high schools are ignored. The stratified random sampling is independently utilized in selecting the number of schools, students, staff, and administrators for ranking based on the integrated model and responsiveness to survey by those involved in education at school based on the students' gender and Morgan table in three districts where have fully, semi- and no utilization. The sample target population is shown in the following Table 34.3.

Table 34.3
Sample size of target population

Name	*School*	*Sample female schools*	*Male staff*	*Staff*	*Female students*	*Male students*
	Male			*Female*		
District with fully utilization	11	17	105	186	156	111
District with semi-utilization	27	17	106	170	144	123
District with no utilization	16	12	84	97	113	111

The qualitative and quantitative information related to the performance evaluation in natural sciences high schools of Qazvin Province is obtained after achieving and weighting the existing documents in educational centers during the school year of 2014-15 and survey high school principals and the performance evaluation scores of offices. The qualitative information of ranking is obtained from two surveys of employee performance according to the indices. The use of e-learning is surveyed as a common index for both staff and students. The values of this index are calculated by averaging the values of these two groups. Five-point Likert scale is applied in developing the questionnaire for determining the indices and surveys in all target groups.

The reliability coefficient of questionnaire for determining the performance indices at natural science high schools is obtained from the Cronbach's alpha coefficient and SPSS software version 19. Cronbach's alpha coefficient is measured by giving the questionnaires to 19 respondents and then the importance of evaluation indices is determined. These people are randomly selected.

Table 34.4
Calculation of reliability coefficient

	N of Cases = 19
N of Items = 29	Alpha = 0.7798

The obtained value indicates the appropriate and acceptable reliability for questionnaire in this study. To determine the validity of questionnaire, it is sought to design all questions from the literature and stakeholders' views, and then provide for the experts in order to increase the theoretical or judgment validity of research. To increase the validity of questionnaires, they are distributed among several educational science experts in order to remove the invalid questions.

The organization is the analysis unit in this study. The spatial domain of this research consists of all natural science high schools (urban) in Qazvin province. The library studies on the subject began in the fall 2014 and then ended in summer of 2015 by collecting the field data and achieving the results. The success ratio test in population and SPSS software (version 19) are applied for analyzing the data obtained from the first question of questionnaire (the responses less than the median are opposites and the responses more than the median are in accordance at Likert scale). To answer the second research question, the Shannon entropy and entropy software are utilized in weighting the indices. The confirmatory factor analysis and fit model are utilized to investigate the impact of indices on each other, and thus LISREL software is applied in this regard. In the third research question, Lingo software is used for determining the efficient and inefficient high schools; and the data envelopment analysis used for ranking. In the fourth research question, the decision-making matrix with Tops is and Expert Choice and Excel software are utilized for analyzing the obtained data. The significance level is equal to 5% in all sections of this research.

4. RESEARCH FINDINGS

The proposed model for natural science high school ranking consists of descriptive and mathematical sections. This model utilizes the developed form of balanced scorecard model. The proposed model consists of five main components: Financial, internal processes, management, development and learning, customer orientation in descriptive dimension. A total of 30 indices are in proposed model and its 5 indices belong to the financial component, 4 indices for internal components, 5 indices for management component,

7 indices for development and learning, 9 indices for customer orientation. The proposed indices have either the quantitative or qualitative types. The comprehensive list of indices is presented in Table 34.5.

Table 34.5
Indices based on the Balanced Scorecard components and its generalization

Main components	*Objectives*	*Variables*
Financial	Budget	Receiving the cash donations by people and donors
		The rates of other people's revenues
	Supplies and equipment	Space allocation and thematic classes
		The existence of office and educational supplies
	Reduction of costs	Reducing the cost of energy, communications of space repairs, and consumed equipment and materials
Internal processes	Teaching	Proportion of courses with teacher's field of study
		The use of active and participatory teaching method
	Evaluation	The use of continuous and final assessment
	Staff Performance Evaluation	Performance evaluation of staff by school authorities
Management	Supervision	Direct supervision, regulation and timely close of offices
	Creativity	Creating the innovative and creative techniques and ways
	Accountability	Appropriate response to students' needs and expectations
		Quick speed of solving the personnel problems
	Division of labor	Division of labor with regard to the job descriptions of subset
Development and learning	Promotion of organizational culture	Teamwork: School staff partnership with council of teachers
		Familiarity with rights: The employees and teachers' knowledge about their rights and duties
		Risk-taking: Facilitating and developing the teachers' working conditions
	Increasing the employee satisfaction	Respect and dignity: Creating the culture of respecting the teacher among the students
		Promotion and development: Creating the necessary conditions for employees' job promotion
		IT condition: School staff e-learning rates
		Satisfaction: School staff mutual satisfaction with each other
Customer orientation	Students	The percentage of students who go to daily state universities (compared to the graduates)
		The students' satisfaction with school staff appropriate behavior
		The students' satisfaction with the quality of extracurricular classes
		The students' satisfaction with educational and research facilities at school
		The students' satisfaction with teacher's teaching method
		Providing the educational counseling and training to students
	Popularity of school	Popularity of school in students' enrollment
		Achieving the scientific and educational success

5. DISCUSSION AND CONCLUSION

The first question test determines which of the components and indices are effective in ranking the natural science high schools. The first question is approved at the confidence level of 95 percent; in other words, all mentioned components and indices of first question are effective in ranking the natural science high schools of Qazvin province.

The following results are obtained to answer the second research by weighting the indices according to the experts and managers' views as presented in Table 34.6.

Table 34.6
Obtained values from entropy

Indices	*Scores*
Receiving the cash donations by people and donors	32
The rates of other people's revenues	28
Space allocation and thematic classes	28
The existence of office and educational supplies	28
Reducing the cost of energy, communications of space repairs, and consumed equipment and materials	32
Proportion of courses with teacher's field of study	32
The use of active and participatory teaching method	36
The use of continuous and final assessment	30
Performance evaluation of staff by school authorities	32
Direct supervision, regulation and timely close of offices	35
Creating the innovative and creative techniques and ways	32
Appropriate response to students' needs and expectations	33
Quick speed of solving the personnel problems	35
Division of labor with regard to the job descriptions of subset	35
Teamwork: School staff partnership with council of teachers	36
Familiarity with the rights: The employees and teachers' knowledge about their rights and duties	32
Risk taking: Facilitating and developing the teachers' working conditions	35
Respect and dignity: Creating the culture of respecting the teacher among the students	35
Promotion and development: Creating the necessary conditions for employees' job promotion	35
IT condition: School staff e-learning rates	35
Satisfaction: School staff mutual satisfaction with each other	35
The percentage of students who have received the average score of 16 or higher in final exams	32
The percentage of students who go to daily state universities (compared to the graduates)	32
The students' satisfaction with school staff appropriate behavior	35
The students' satisfaction with the quality of extracurricular classes	35
The students' satisfaction with educational and research facilities at school	35
The students' satisfaction with teacher's teaching method	35
Providing the educational counseling and training to students	35
Popularity of school in students' enrollment	35
Achieving the scientific and educational success	35

The Root Mean Square Residual (RMR), Goodness of fit index (GFI), normed fit index (NFI), non-normed fit index (NNFI), incremental fit index (IFI), comparative Fit Index (CFI), and the important index "Root mean square error of approximation (RMSEA)" are utilized for evaluating the confirmatory factor analysis model

Table 34.7
Fit indices of measurement model for research variables

Index	*Desirable limit*	*Reported value*
Root Mean Square Residual (RMR)	Close to zero	0.100
Standardized Root Mean Square Residual (SRMR)	Close to zero	0.065
Goodness of fit index (GFI)	0.9 and higher	0.91
Normed fit index (NFI)	0.9 and higher	0.95
Non-normed fit index (NNFI)	0.9 and higher	0.98
Incremental fit index (IFI)	0.9 and higher	0.99
Comparative Fit Index (CFI)	0.9 and higher	0.99
Root mean square error of approximation (RMSEA)	0.1 and less	0.061
Chi-square per degrees of freedom	Less than 3	1.39

According to the features of Table 34.7, the data of this research has good fit with factor structure and theoretical infrastructure of research and this indicates the consistency of factors with theoretical structures.

The balanced scorecard variables consist of 30 indices and this model is implemented in LISREL software and its indicators drawn.

Therefore, based on the findings of this model, the estimated parameters can be statistically considered reliable in target model, and then applied for compliance of indicators with studied structures.

The calculated *t*-values for each of the factor loadings of each remained indicator with its latent structure or variable are higher than 1.96, thus the consistence of subscales in questionnaire is valid for measuring the concepts at this stage. In fact, the results indicate that whatever the researcher has intended to measure is achieved by this tool, so the correlation between the latent structures or variables is reliable.

Examination of proposed model at natural science high schools of Qazvin Province: It is found that 4 out of 28 districts with utilization ability have relative efficiency and the rate of efficiency in other units is less than 1. Anderson-Peterson model is used for complete ranking. Given the results of this input-based model and the complete ranking based on Anderson-Peterson model, the schools of units 16, 12 and 9 have respectively found the first, second, and third ranks and the school of units 5, 4 and 14 have put on the last ranks respectively.

From 44 units with semi-utilization, 6 units have had the relative efficiency, and the efficiency of other units is less than 1. According to the results of this model and the complete input-based ranking and based on Anderson-Peterson model, the schools of units 7, 11 and 13 are respectively put on the first, second, and third ranks, and the schools of units 39, 15 and 17 are respectively put on the last ranks.2 out of 28 units with no utilization have had the relative efficiency, and the efficiency of other units is less than 1. According to the results of input-based model and the complete ranking based on Anderson-Peterson model, the units 2, 16, and 28 have put on the first, second, and third ranks, and the schools of units 22, 27 and 24 have been put on the last ranks.

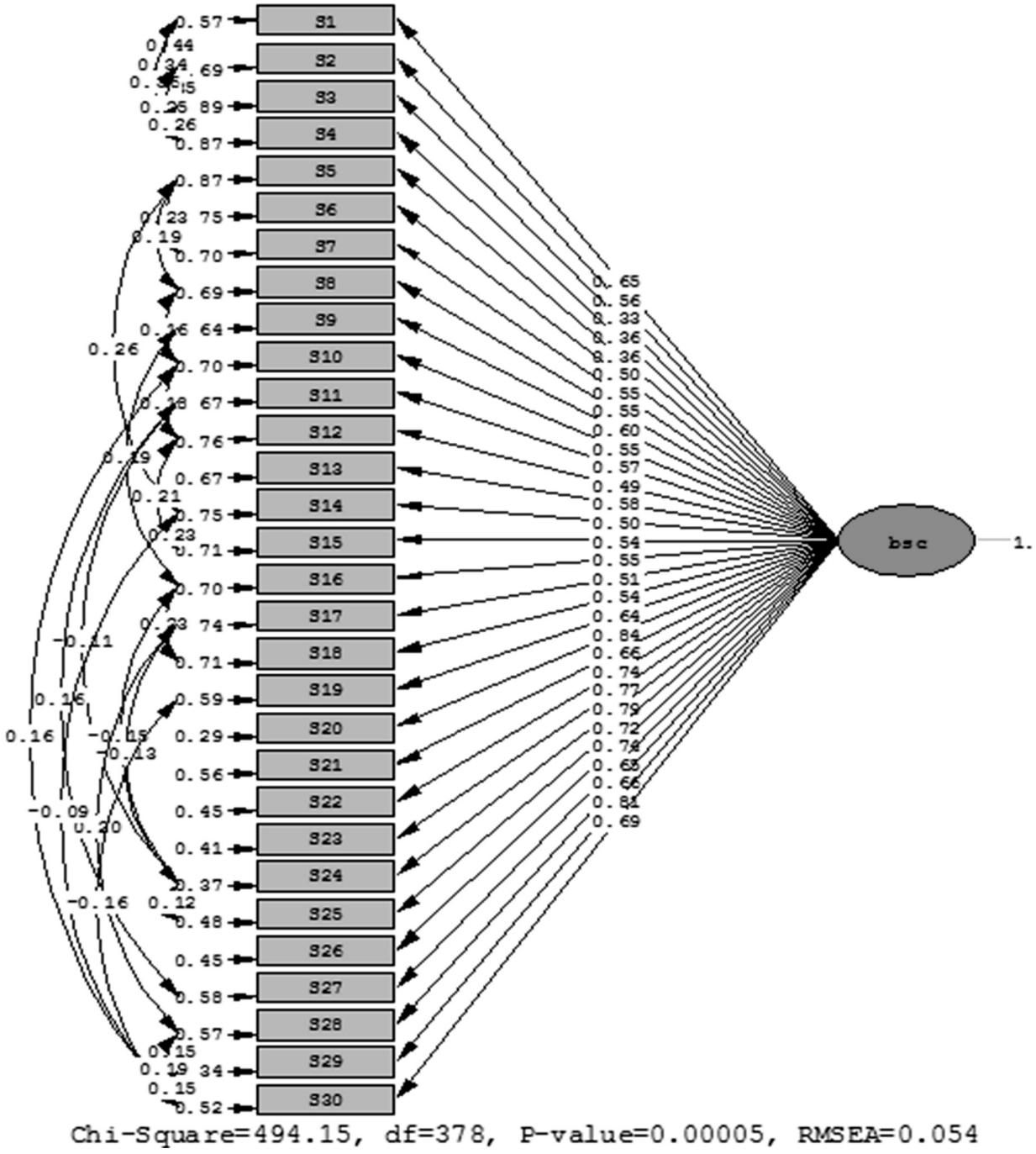

Figure 34.1: Fitted model for measuring the variables

According to the expert's decision-making matrix for the performance of 28 high schools with utilization ability, 44 high schools with semi utilization ability, and 28 unit with non-utilization of TOPSIS and based on the indices of designed model, the schools of units 16, 19 and 12 in the region with utilization ability have been put on the first, second, and third ranks and the school of units 4, 5 and 14 are put on the last ranks respectively. In the district with semi-utilization, the schools of units 7, 11 and 13 are put on the first, second, and third ranks and the schools of units 39, 15 and 17 on the last ranks, respectively. The

schools of units 2, 16 and 28 in the district without the utilization are put on the first, second, and third ranks and the schools of units 22, 27 and 24 are respectively put on the last ranks.

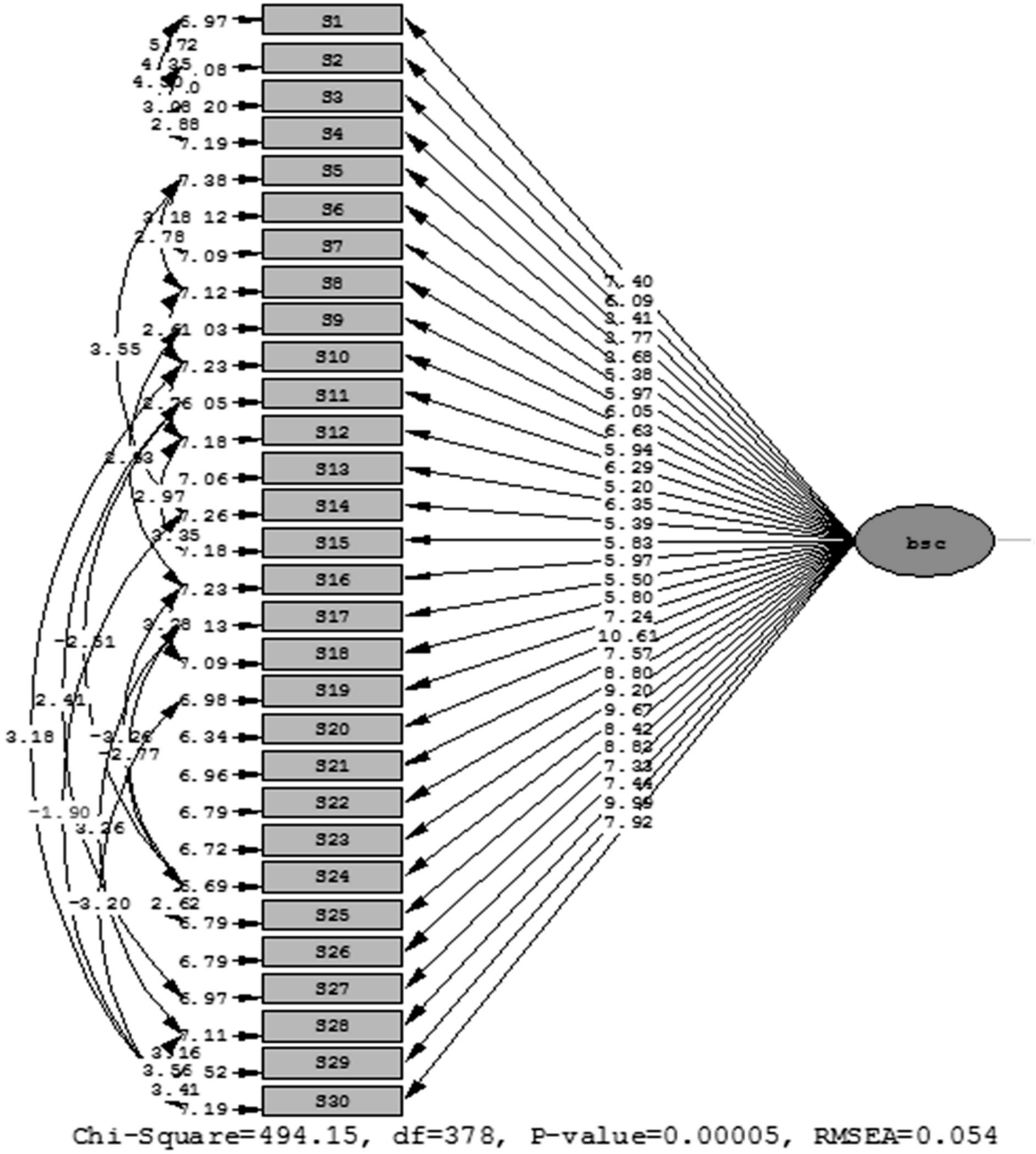

Figure 34.2: T-values for investigating the significance of parameters in fitted model of variable

According to the comparison of ranking based on the DEA and TOPSIS, it is found that there is different between the second, third, fifth, eighth and twenty-fourth ranks in the utilization districts, and between the twenty-fifth, fifteenth, twenty-sixth, and forty-first ranks in the semi-utilization district, and between the twelfth and fifth ranks in the non-utilization district.

6. SUGGESTIONS: PRACTICAL STRATEGIES

1. It is suggested disseminating the results of school ranking in different districts in order to increase the efficiency and perform the appropriate planning by other centers according to the schools which have high efficiency and take the optimal utilization of resources and costs.
2. To increase the efficiency, the schools re suggested utilizing the boards of trustees (investment) in order to be more successful in student attraction and their graduation, and increase their efficiency.
3. For accurate and more effective assessment of schools, it is suggested predicting the future efficiency of inefficient units, and then making the strategic decisions for making the inefficient units efficient.
4. According to the results of research in inefficiency of some schools, it is suggested conducting the accurate study on the causes of this problem in educational system in order to prevent this crisis in the future.
5. It is suggested holding the training courses for staff learning and development and also the seminars for managers and employees at natural science high schools.
6. It is suggested creating the culture for necessary conditions in order to implement the right model.
7. For further validation of model, it is suggested implementing the model gradually after performing at a few numbers of schools and acquisition of necessary experience.
8. It is suggested using the provided model after the localization in other districts of country.

References

Aramesh, M. & Aramesh, R. (2014), The Evaluation of Efficiency and school ranking by DEA and AHP Techniques. Andishegan Publication, Tehran.

Olia, M.S. (2010), Designing the Performance Evaluation System. Research Centers affiliated to Ministry of Science, Research and Technology. Tehran: Research Analysis and Evaluation Office, Ministry of Science, Research and Technology.

Ahmadi, F. (2011), Implementation of Scorecard. Tadbir Monthly, No. 201.

Dadkhah, S. Amini, M.T. & Foroozandeh Dehkordi, L. (2013), Developing an Strategic Map for Private Research Institutes Based on the BSC Model. Case-Study: Iranian Academic Center for education, culture and research (ACECR), Development management Quarterly. Vol. 26, No. 1, Serial No. pp. 87-108.

Rahmani, A. (2013), School Performance Evaluation by BSC and IDEA. Management International Conference, Challenges and Solutions. Shiraz.

Shahmoradi, M.A. (2004), Performance Evaluation of Subsidiary Data of an Industrial Complex by Implementing the Balanced Scorecards. Master's Thesis. University of Tehran, Technical College.

Namazi, M. (2003), Evolution of Balanced Evaluation. Seventh Iran Accounting Seminar. University of Mazandaran, Babolsar.

Mehrgan, M.R. & Dehghannayyeri, M. (2009), Combining the Balanced Scorecard and Ideal Planning for Strategic Determination and Development at Management Colleges of Tehran. Basirat Quarterly. 17th year, No. 45, pp. 39-53.

Momeni, M. (2006), Modern Discussions about the Research on operation. University of Tehran Press. Fist Edition.

Moazzami-Goudarzi, M.R.; Jaber-Ansari, M.R.; Moallem, A.; and Shakiba, M. (2014), Application of data envelopment analysis (DEA) in evaluating the relative efficiency and ranking the branches of Refah Bank in Lorestan Province and comparing its results with TOPSIS, Economic research quarterly (sustainable development), 14th year, No. 1, pp. 15-126.

Mirkamali, S.M. (1997), Investigation of Productivity and providing a Model for Measurement. Management in Education Quarterly. School Publication. No. 28. p. 49.

Houman, H.A (2005), Structural equation modeling by application of LISREL software, SAMT publications, First edition.

Kaplan, R.S. & Norton D.P. (2001), The Strategy-Focused Organization, Harvard School Press.

Yuksel, Harun & Coskun, Ali. (2013), Strategy schools. An implementation of the balanced scorecard in provision of educational services. 4th international conference on new horizons in education. Pp.2450-2459.

Quoted in SICI Report, (2001), The Effective School Self-Evaluation project, Standing International Conference of Central and General Inspectorates of Europe, Brussels European Commission.