

The investigation of scientific methods of achieving the goals of fifth development plan by Multivariate regression and factor analysis technique

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ABSTRACT : One of the important factors in planning process in Iran is determining its goals and after it the achieving methods to the goals are formulated or the strategies are defined. Most of the goals in development planning are qualitative and the achievement of the goals requires exact calculations and turning most of the results as quantity. In this study, the achievements to development goals are evaluated by statistical apabilities and modern planning. The results of this study showed that in planning process before execution by the existing variables, we can define the results of development plans. Before performing the final stages to achieve the goals, determining the priorities is predicted by scientific methods and in execution process causes the easy achievement of the goals of development plans.

Keywords: Multivariate regression; fifth development plan; factor analysis

INTRODUCTION

If the purpose of each country or society is achieving development or improving life conditions and the development is logical use of the resources and opportunities and its fair distribution, planning and knowledge and art is logical application of the resources to achieve development goal. The fact is that each country or society is faced with the limitation of the resources and on the other hand it has infinite requests and needs. The relation between limited resources and infinite needs as the requirements of the customers are responded with limited resources is optimized planning process.

Indeed, planning is a process for rapid and easy achievement to development aim in which both path and stages to achieve the aim and achieving method are determined. In Iran during 1327 until now, 10 periods of planning are done and now we are at the beginning of fifth development plan after revolution. The ways and methods of achieving the plans aims are of great importance. As it was said before, determining the view of each plan by scientific principles has high position in planning process and in this study, it is attempted that by scientific methods, the best way to achieve the goals of fifth plan is determined by valid scientific methods. In the current study, to evaluate 9 goals of fifth development plan, the valid UN organization method is raised as human development and after taking quantity results; we can consider the 9 levels of development goals of fifth plan as dependent variable and by statistical method of factor analysis technique we can summarize the quantity results and the output of factor analysis technique is independent variable and by this method by Multivariate regression, the development curve line is drawn and the priority sections are predicted based on variance value. Some of the characteristics of this method are such that at first the priorities are defined based on factor analysis technique and model and different sections by correlation curve are located in homogenous groups under definite titles and the share of each factor is defined exactly. Also, by this method, by having access to quantity data of execution stages of initial years or execution data of development plans of previous periods are done based on prediction percent and priority of the execution stages and easy access to the goals. These calculations divide the percent of goals with execution capabilities of each article in each 9-group to 4 sections of 25 percent. In each article, when we have access to the maximum quality aims, 100 percent is calculated. As fifth development plan is in initial stages and achieving to the data of approved articles is not available, the accesses to these goals are expressed as assumed. One of the strengths of this issue is summarizing considerable data in statistical issues and their significance. The easy calculation by computer

and low time compared to other methods are the advantages of this method. The weakness of this method is the considerable sensitivity of statistical data to the results. As the statistical data is not updated in developing countries like Iran. Thus, the output of the calculations is far away from the realities.

Statement of the problem

Fifth development plan is consisting of an introduction and 207 articles and 9 chapters with titles:
 First chapter, Islamic – Iranian culture, 17 articles
 Second chapter, science and technology, 11 articles
 Third chapter, social, 20 articles
 Fourth chapter, administrative and management system, 17 articles
 Fifth chapter, economical, 93 articles
 Sixth chapter, economical development, 16 articles
 Seventh chapter, defensive, political, security, 12 articles
 Eighth chapter, legal law, 8 articles
 Ninth chapter, budget and supervision, 11 articles

Most of the goals of this plan have quality approach that at the end of the period, we should achieve it in the country. The evaluation of its results and presenting achievement methods are of great importance as fifth plan goals is to achieve 20- year vision of Islamic Republic of Iran defining the clear horizon of Iran in 1404 hijri Shamsi and developed Iran with the first economical, scientific and technology rank in the region with Islamic and revolution identity inspired Islam and predicted with effective interaction in international relations (Government information basis). As the share of 9-factors in fifth development plan is different, to achieve the optimized results, the priorities are of great importance. The current study defines the priority method of 9 priorities being found to fifth development plan. Then, the share of each factor is defined by factor analysis technique before we take the final stages of development in terms of time and development path by quantity figures in each year to the end of stage is drawn. The development factors and barriers in execution process of fifth development plan can predict as quantitatively and by recognizing it, they are taken out of development path easily and final stages are continued with success. In execution stages of development plans of previous periods, the goals are not accessed easily or the access to the goals is not with maximum optimum. The reason is the lack of exact index evaluating the goals as quantitatively or the quality of the goals that their quantity is not used in them. In most cases, the lack of achieving the development goals is due to the lack of exact priority of development stages. As among various goals, there are some relations among some groups affecting each other and the achievement process to development goals are possible easily. For example, achieving the results of fifth chapter goals of fifth development plan being raised in economical section affects the achievement to the goals of second chapter of fifth development plan, science and technology as good economical conditions are the pre-requirements of achieving science and technology goals.

indices of fifth development plan of Iran based on human development index

Combinational index of HDI was applied for the first time in 1990 by UN (UNDP, 1991). This organization was used for grading the countries in terms of human development model and by considering the similar importance of the indices was used for ranking. The civil plan of UN in this model applied life expectancy index, literacy percent and per capital income for grading the countries. But in regions, cities to investigate the development degree, we can apply many indices (Hekmatnia, 2006). By the above model to apply various indices (even by valuating the applied factors) we can provide combined index (including structural, economical and social) for the regions and provinces for the required goals and determine the priorities (Ziari, 1999, 136). The development index is presented in this study. The stages of this method are as following:

After the variables were selected, in the first stage:

Its matrix table is drawn and for each of the regions in Iran in the columns, the indices are defined in the rows.

After the formation of data matrix table in the second stage:

Each of the variables is applied to use in statistical analyses by the following formula:

$$X_j = \frac{\max_i x_{ij} - \text{row}_j x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}$$

It is standardized.

In the third stage:

All the standardized indices that are achieved in the second stage by the following formula:

$$xI_{ij} = \frac{1}{n} \sum_{i=1}^n I_{ij}$$

The average of the data of first formula was calculated and for the regions in the country, average index was calculated. It can be said that the achieved average shouldn't be more than 1 or less than zero.

Fourth stage:

In this stage that is main stage, the development indices of various parts of the country are achieved by the following formula:

$$IDI = (1 - I_{ij})$$

It is calculated that as the value is close to one, it shows more development and as it approaches zero, it shows the lack of development and deprivation (Sepahi, 2009).

Factor analysis technique

Factor analysis model is a good method to summarize and classify much data. Summarizing the information in this method is done as the result of summary is significant in terms of concept (Talebi and Zangiabadi, 2001). In most cases, due to the variety of the phenomena, we can not study all the indices and if such thing is possible, the result is not good. Thus, the information of various sections are classified in the first step to study. Factor analysis has some various applications and there are various methods in terms of its application and aim of the study subject and we can refer to R,Q types. The type R is applied when the aim of the researcher is summarizing some of the indices as significant factors. When the aim is combining and summarizing some of various parts in homogenous groups in Iran, Q type analysis is applied (Kalantari, 281, 2003, 391). For this study, type R factor analysis is proposed. The mentioned method is not only applied for clustering the phenomena with various characteristics, it is considered as a criterion for hierarchy of various sections in terms of development degree (Rahnama, 1994). The major terms of factor analysis are consisting of as following:

Factor is consisting of linear combination of the main variables showing summarized aspects of the observed variables.

Factor loading is consisting of the correlation between the main variables and factors. In other words, it shows the correlation between factors and variables.

Factor matrix showing the percent of variance of each of the factors.

Matrix rotated factor, in this matrix the place of variables is changed. Indeed, in this process for adjusting the factor is used to achieve the significant and simple factors.

Factor weighting is the factor that is given to each of the variables to achieve factor score.

Factor score, is the numerical weight that each of fifth plan sections after multiplying factor weight is achieved via equation (Z) standard.

The Eigen value shows that variance value determined by each factor.

One of the characteristics of factor analysis is such that the following items exist from the first factor to the next factor:

The variance is away from +1.

The numbers of loaded variables in the factors are reduced.

The homogeneity of the variables are reduced.

The influences of factors are reduced.

The Eigen value of the factors is reduced.

It is possible that in the final factor, no variable is loaded.

In case of the lack of requirement to the definite amount of variance, some final factors are eliminated (Zangiabadi, 1999, 36).

The stages of factor analysis

The stages of factor analysis are as following:

The formation of data matrix of putting the indices in the columns and 9- sections by development of the country in rows.

The calculation of correlation matrix: To do the calculations in the next stages and internal relation between index, correlation matrix was applied. The indices are ordered in positive direction.

The extraction of the factors is done by matrix. By factor matrix, the common factors and relative importance of each of the indices are defined. Then, Eigen values for non-zero values are calculated. The Eigen value in loading value corresponding with the indices for the factor is defined factor loading. In factor analysis, in connecting the indices with each other, the indices have correlation factor above 0.5 (Anderson, 1958). The extraction of the loaded indices is done by varimax rotation in factor analysis.

The prediction model of the priority of developing 9-section of fifth development plan

By SPSS and multi-variate regression, we can calculate the priority of the development of 9-section of fifth development plan based on factor scores (Kinber et al., 2002). In this study, the combination development index of fifth development IDI was considered as dependent variable and factor scores were considered as independent variable. The exact analysis of effective factors in development of Iran is done based on regression relation.

The prediction model of Iran development priorities during fifth plan based on multi-variate regression model and factor analysis technique

By SPSS software and multi-variate regression model, we can calculate the priority of developing rural regions based on factor scores. In these calculations, IDI is used as dependent variable and factor scores are considered as independent variables.

The results of the calculations are calculated by R² of determination factor and this factor shows the dependency of the changes of fifth development plan in the applied indices in its evaluation that is calculated above 90%. By reduction of independent variables, the determination coefficient is reduced and in case of increasing its, the development of the country is added. Example of Table 1.

In the example of Table 2, variance analysis of significance of regression in linear relation between the variables is calculated as sig: 0.000 showing the significance at 98% and it is supported.

By Table 3 that shows the regression model, the prediction model of fifth development plan priorities is presented as example. Thus, the assumed regression prediction is calculated as following:

$$Y=0/312+0/148F_1+0/109 F_2+0/091 F_3$$

The significance level shows that the effects of first and second factor had the highest significance level and is of great importance to predict the priorities of development of Iran because a change unit in standard deviation of development degree is changed as 0.705, 0.520 and 0.434. Beta values show the high importance of the first factor to two factors. Thus, by considering regression model, we can say that prediction factors for development of Iran regions are as following:

Improving human development levels, etc

Improving health, etc

Improving air industries, etc

Etc.

The example of Table 1. The statistics of multi-variate regression analysis of development indices of fifth development plan

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.977(a)	.955	.941	.05080

a Predictors: (Constant), REGR factor score 3 for analysis 1 , REGR factor score 2 for analysis 1 , REGR factor score 1 for analysis 1

Example of Table 2. The multi-variate regression variance of improving indices of nine-sections of fifth development plan

Model	Sum of Squares		df	Mean Square	F	Sig.
	Regression	Residual				
1	.546	.026	3 10	.182 .003	70.563	.000(a)
	Total		13			

a Predictors: (Constant), REGR factor score 3 for analysis 1 , REGR factor score 2 for analysis 1 , REGR factor score 1 for analysis 1

Example of Table 3. The coefficients of development indices of regression of nine sections of fifth development plan of Iran that entered the model

Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	t
1	(Constant)	.312	.014		22.953
	REGR factor score 1 for analysis 1	.148	.014	.705	10.494
	REGR factor score 2 for analysis 1	.109	.014	.520	7.737
	REGR factor score 3 for analysis 1	.091	.014	.434	6.459

a Dependent Variable: IDI

Table 4. The summary of the execution data of fifth development plan of Iran in the first 39 articles

Article	The first 0.25% of the goals	The second 0.25% of the goals	The third 0.25% of the goals	The fourth 0.25% of the goals
1	Formulating Islamic-Iranian model of development	Formulating Islamic-Iranian model of development	Stating the model	Stating the model
2	The design of cultural engineering map	Providing cultural attachment of important and new plans	The design of cultural engineering map	Providing cultural attachment of important and new plans
3	Article a. plans Development, etc	Article b plans, design, etc	Article c plans, productions development	Article d, e plans, development of system and development
4	Formulating national document of developing international cultural relations	The improvement and convergence between the religions followers	The relation with Iran study and Islam study	Approving national document by board of ministers
5	Performing article a. Providing land for mosques	Performing article b, the mosques in park and urban parks	Performing c, the mosques of all the execution systems	
6	Performing article a, national symbol of Imam	Performing article b, fundamental studies		
7	The development of scientific centers of associations			
8	Performing concentrated row in the budget			
9	The establishment of non-state funds at national and international level			
10	Performing article a, completing 50% of completion costs	Performing article b, financial support of cinema townships, etc		
11	Performing article a, improving the health of cyber space	Performing article b, improving satellite media		
12	The establishment of tourism development fund	Easy cheap trips, etc		
13	Performing article a. issuing activity license, etc	Performing article b, the establishment license and supporting specialized institutions	Performing article c, financial support of setting up the museums, performing d, financial support of the centers of protecting traditional works and nomads	Performing e, financial and spiritual support of ownership, etc and performing article f, the identification and supporting the cultural and historical works of Iran museum
14	Performing article a. formulating the mechanisms of...	Performing article b, the development of cultural affairs		
15	Long-term rent of physical education centers			
16	Performing 1% of credits to the centers sport	Approved by the board of ministers		
17	Delegating non-agricultural land from Jihad Keshavarzi to physical education organization			
18	Performing article a, reviewing textbooks, improving quality indices, formulating interdisciplinary fields	Performing b. The main overview in the process of academic guide of students	Performing c. The establishment of scientific and practical experiences of revolution, performing d, deepening Islamic values	Performing e. The collaboration of university and Hoze Performing article f. Financing fundamental education with the aim of eliminating the Islamic system needs
19	Performing article a. The review of regulations of faculty members Performing b. The planning to increase acceptance to post-graduate periods	Performing article c, organizing the index to faculty member	Performing d. setting up applied laboratory	Performing e, increasing research share of annual gross production as....
20	Performing a. financial support of demand-based studies.. performing b. financial support of knowledge-based companies.	Performing c. formulating regulations and financial support. Performing d. developing the legal advantages of free zones	Performing e, financial support of developing stock... performing f, financial support of post-graduate theses. Performing j. delegation of intellectual property	Performing g. paying a part of patents..... performing h. Real estate and document organization... for patent. Performing I, tax exemption of scientific fields

21	The recommendation of ministries to approve fund statement by the board of ministers	The establishment of scientific and technology fund	Providing national resources	Paying the extra credits not absorbed to fund
22	Performing a. improving the position of elites... performing b. facility of academic improvement	Performing c. presenting financial support and scholarship, performing d. academic guide in priority fields	Performing e. providing social security insurance and basic health insurance	Performing f. Removing the concern of risk taking, performing g, supporting commercialization of its achievements
23	Adopting comprehensive plan of fundamental change of education system	Performing the plan		
24	Performing article a. per capital costs of educating human resources, performing b, automotive management of university. Performing c without the obligation of part d- absorbing equivalent public income.	Performing f. supporting the development of international collaborations, performing g. The establishment of education and research organization, performing h. The establishment of students organization	Performing I, delegation of welfare services of the students to non-state section.	Performing j. supporting 10 good universities, performing k, giving scholarship in Iran and abroad to war veterans
25	Performing a. the design of education	Performing b. providing the active presence of private sector in education development		
26	Running 20 percent of schools and board of parents			
27	Stabilizing the schools of the difference of the costs of credits attributed to fifth plan law			
28	Performing the policies of reducing authority of the government by developing quality supervision			
29	Improving human development index			
30	Performing a, reducing the dependency of this retirement fund	Using new methods of retirement funds		
31	Establishment of comprehensive social system			
32	Performing a. The establishment of private retirement funds	Performing b. the permit of all the insured people to change the fund	Performing c. defining the share of government of business jobs	Performing d. obligation of all the foreign people living in Iran to have insurance
33	The obligation of the government to avoid new law to insurance organization	Reducing the deferred debts of the government		
34	Permitting the staffs of retirement funds in case of transferring to other systems is including retirement fund			
35	Modification of the workers wage during retirement as natural rate			
36	Performing a. stating national health standards	b. creating the system of comprehensive services of health		
37	The recommendation of defense ministry to cover social security organization of arm forces in case..	Performing b. stating the list of healthy materials		
38	Performing a. financial support of government of non-state sector for creating knowledge and health townships			

Source: The site of Islamic council parliament, fifth development plan bill

CONCLUSION

One of the important factors of the success of development plans is having execution goals and moving in time process. The recognition and prediction of development goals are of great importance for planners. This study by applied approach is one of the scientific methods to predict, evaluate the priorities of fifth development plan. The results showed that by IDI method of UN we can achieve development index in fifth

plan of development and by factor analysis technique and multi-variate techniques, we can define the capabilities of development priorities as quantity and the share of nine factors of fifth plan is defined exactly to fulfill to achieve the goals of 20-year vision in Iran.

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