Iran Solutions against the Economic Sanctions: Analytic Hierarchy Process Approach

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Sanctions are penalties or limited program against some societies, countries or nations. Sanction usually consists of a ban on the sale and shipment of products to a country and on the purchase of its exports. Some countries have done it in various types against Iran since 1979. Recently due to nuclear program of Iran, the number of sanctions have raised dramatically. However, Iran can definitely manage and overcome them with appropriate policies and decisions. In this paper we evaluate some chosen solutions of Iran in front of economic sanctions (ES) using a multi attributes decision model named analytic hierarchy process method in three clusters as the local ,regional and global scopes. The results showed the efficiency of this decision making model in these sanctions. The results also indicate the best strategies to reduce and acting proactively against economic sanctions.

Keywords: economic sanctions; Iran decisions; analytic hierarchy process

Introduction

Sanctions are penalties or limited program against some societies, countries or nations. Nowadays, economic sanction is a pretty important issue for Iran. An economic sanction is an unstable and dangerous situation affecting an individual, group, community or whole society. Sanctions are deemed to be negative changes in the security, economic, political, social or environmental affairs, especially when they occur abruptly, with little or no warning. More loosely, it is a term meaning 'a testing time' or an 'emergency event'. An economic sanction is a sharp transition to a limited framework. When economic sanction takes place in countries, they find and do some applicable and reactive (respond to the sanctions properly solutions in separate or mixture modes.

Additionally countries would make proactive solutions in front of economic sanctions. Iran has experienced economic sanctions from various nations since 1979 till now. Especially due to act of Iran in nuclear power since 2006, the number of economic sanction has increased surprisingly. So what is the best act or decision of Iran against these sanctions? Is it possible for Iran to make decision proactively? Which scope is more important for Iran, local, regional or global? These questions illustrated in this study. The aim of this paper is evaluation of Iran decisions in front of economic sanctions through AHP method.

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Literature Review

There are many studies and researches about sanctions in the whole world. We present some related to Iran sanction. Motaghi (2000) presented an introduction for the Iran conflict. The results have indicated that sanctions of Iran besides negative effects for Iran have some bad impulse for other countries. Mehregan et al (2004) measured sanction effects on Iranian high tech industries and rank high Iranian tech industries based on their vulnerability from sanction. Behroozifar (2005) investigated the one-side sanction of some nations on Iran. His estimates showed that this sanction has effects on international trade of Iran in energy scope.

Maleki (2007) searched about some scenarios of Iran to overcome the sanctions. He showed the role of the Persian Gulf in performance of Iran against sanctions. Mohammadamini and Ravanshadnia (2008) studied the impact of Iran sanction on procurement of means and devices. They evaluated various kinds of sanctions on procurement of means and devices in Iran. Habibian (2011) in his research attempted to determine the role of illegal organized dissidents in the psychological warfare of nations against Iran. Economic sanctions have always been manipulated to political and economic ends. The history of using economic sanctions goes back to the days before Christ. Before the World War I, economic sanctions were used as a supplementary measure to non-military actions. However, some member countries of League of Nations that had realized the impacts of such sanctions on Axis Countries during World War I, tried to include them

in the League of Nations covenant as non-military and a diplomatic measures (Behroozifar, 2005). Various nations have repeatedly used economic sanctions against Iran since its revolution in 1979, the most famous of which is known as ILSA. But, threats to penalize the European companies who invest in Iran to develop its oil and gas fields did not encourage them to move in line with some policies. In fact, such sanctions exacerbated the existing conflicts between the interests of the nations on two sides of the Atlantic Ocean.

Limitations imposed by some government on Iran do not comply with its policies regarding diversification of energy resources and increasing global oil supply as well. Since, the main reason of diversifying the energy resources was originally to minimize the risk of the disturbed flow of oil. Moreover, globalization and elimination of international trade barriers has considerably decreased the chance of success by unilateral sanctions. The imposed sanctions do affect the economies of target countries as well as the economy of the world and even those countries that imposed the sanctions themselves.

So economic sanction is a kind of sanction against Iran which has been imposed by some government or under some nation's pressure by the international community or countries.

Economic sanction imposes as a tool to pressure and coercion in promotion of foreign policy goals Valizadeh (2011) and contains some acts like prohibiting Iranian banks to global financial flows or International trade.

Nations see this kind of sanction as a substitution of military strategy. Economic sanctions have been increased since 2005. Since 2006, the Security Council of some nations has imposed four rounds of sanctions against Iran in response to its nuclear program.

Acting under Chapter VII of the *Charter of the United Nations*, the Security Council adopted resolutions 1737 (2006), 1747 (2007), 1803 (2008) and 1929 (2010) imposing sanctions against Iran in response to the proliferation risks presented by Iran's nuclear program in light of Iran's continuing failure to meet the requirements of the International Atomic Energy Agency (IAEA) and to comply with the provisions of earlier Security Council resolutions. We can show the framework of economic sanctions like Figure 1.
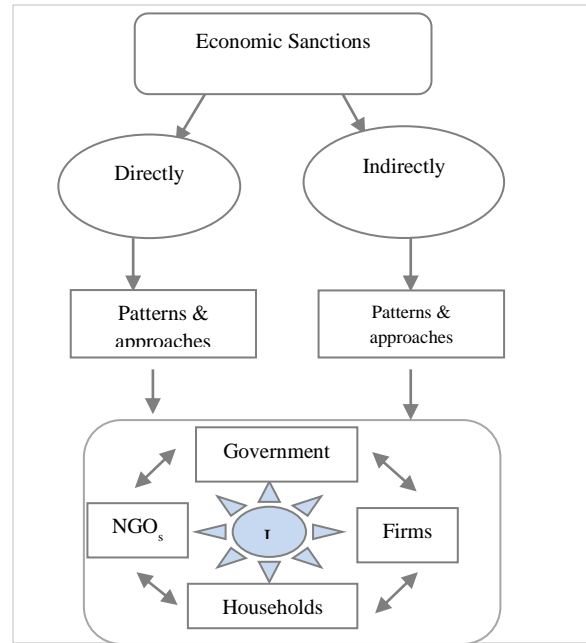

Figure 1. The economic sanctions against Iran

Moreover, this framework can be seen in scenario spaces like figure 2. As it presents, the four spaces is designed by mixing sanction and stability. The current position of Iran is stability- Increasing sanctions. The best space for Iran is stability-decreasing sanctions, so the movement of this country should be in this side. But the sanctioners try to shift Iran from current position to Instability-Increasing sanctions.
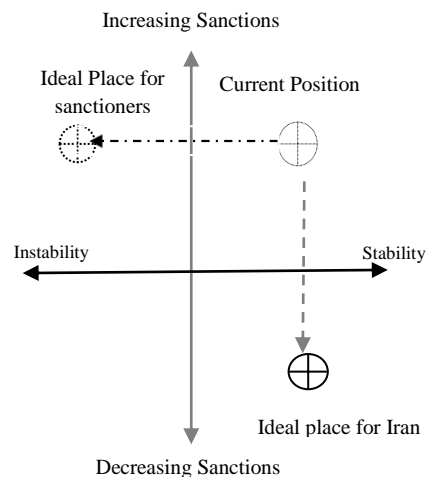

Figure 2. Scenarios of economic sanctions against Iran

As the study shows, economic sanctions are predicted to exist in future. But it is vague and it needs the proactive manner of Iran and this proactive manner means making brilliant decisions (MBD). Selection of these decisions or solutions needs a significant decision making model (DMM). One of the most well-known models of DMM is Analytic Hierarchy Process (AHP).
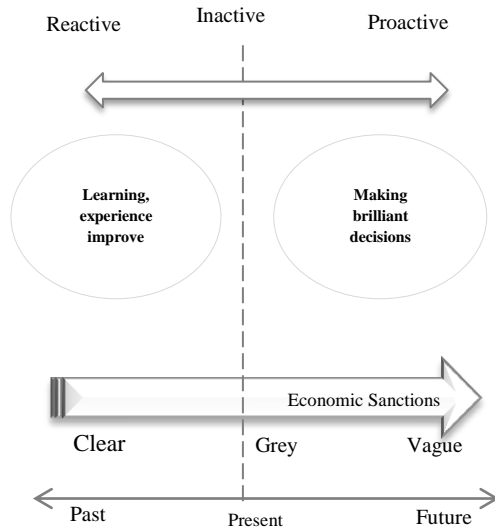

Figure 3. Iran and Economic Sanctions

Analytic Hierarchy Process

The Analytic Hierarchy Process (AHP) is an integrated and structured technique for dealing with complex decisions that was developed by Thomas L. Saaty in the 1970s and has been extensively studied and refined since then. In many cases of the real world, we should measure to solve the problems, not count to do it. For measuring in this method, the individual tacit and explicit knowledge and experiences are used. This method is subsection of a series as Figure 4.
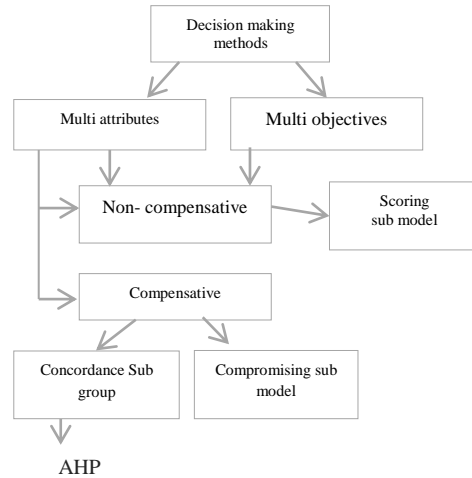

Figure 4. The AHP place in DMM; Source: Rasoulinezhad (2012)

The first step in the Analytic Hierarchy Process is to design the problem as a hierarchy. In doing this, participants explore the aspects of the problem at levels from general to detailed, then express it in the multileveled way that the AHP requires. As they work to build the hierarchy, they increase their understanding of the problem, of its context, and of each other's thoughts and feelings about both (Saaty 2008). The framework consists of an overall goal, a group of options or alternatives for reaching the goal, and a group of factors or criteria that relate the alternatives to the goal. Once the hierarchy is built, the decision makers systematically evaluate its various elements by comparing them to one another two at a time, with respect to their impact on an element above them in the hierarchy. In making the comparisons (in according to Figure (4), the decision makers can use concrete data about the elements, or they can use their judgments about the elements' relative meaning and importance.
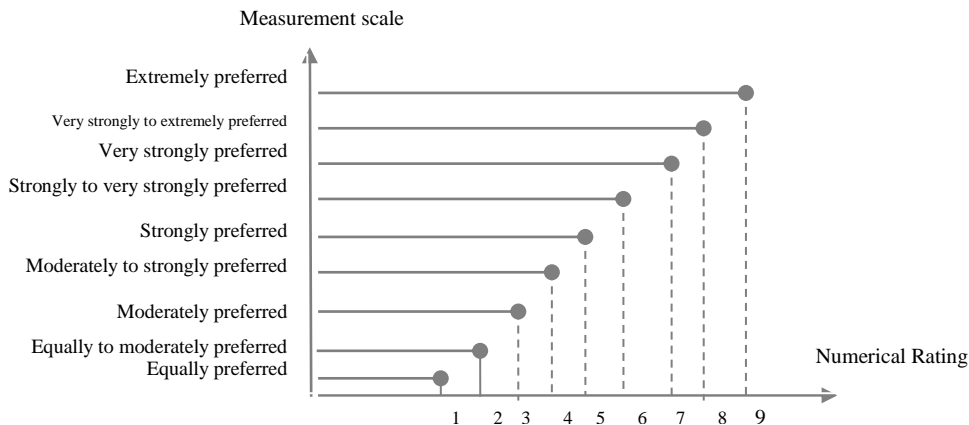

Figure 5. The weight spectrum in related to AHP method, Source, Rasoulinezhad (2012).

It is the essence of the AHP that human judgments, and not just the underlying information, can be used in performing the evaluations (Saaty 2006-8). Based on pair wise comparison judgments, AHP integrates both criteria importance and alternative preference measures in to a single overall score for ranking decision alternatives. Finally priority synthesis computes a composite weight for each alternative, based on preferences identified weighting changes can affect the changes of ranks of alternatives. The consistency of the result is measured using a Consistency Ratio (CR). In summery we can show the AHP method in six levels, listed below:

- Choosing Goal
- Designing Hierarchical Structure
- Pair wise Comparison
- Relative weight stimulation through Eigen Value
- Calculate final weight through relative weight stimulation
- Consistency and Sensitivity test (Rasolinezhad 2012).

Research Methodology

This paper tries to evaluate Iran brilliant decisions in front of economic sanctions via a decision making model named AHP. The research methodology in different sections of this paper is as below:
-Achieving the existing data about economic sanctions
-We use documentation method which extracts data and information from World Wide Web, Journals, Newspaper and Books.
-Choosing Evaluation Factors of economic sanctions

In our study, 33 factors in three clusters are picked up as shown in figure 5. We choose these factors in accordance to former studies like Gharavi (2002); Abu nouri (2006); Mirdamadi (2007); Mosalanezhad (2008); Saei and Khezri (2009); Vaezi (2009); Tehrani et al (2010); Mousavi (2010); Ghadimi (2010), Valizadeh (2011); Simbar (2011), Rasoulinezhad (2012), document and counsel with economist and strategist experts too. The Delphi method is used to determine the coefficients of evaluation criteria. In this paper we use expert sampling and the questionnaire was given to economist and strategic management experts (that conclude ten economists and ten strategic managers) in January of 2012 to weight these factors and clusters.

Data Analysis:
All the analyses have been done using Expert Choice (11) software. This software is used for decision making analysis.

Cluster 1. Local Decisions (LD)

-multi skilled human resources
- sanction management
- Precaution alert system (PAS)
-support local industries
-futurology
-review current regulations
-equity in development growth
-dynamic equilibrium in local markets
-improving entrepreneurs
-Islamic finance system
-using last experiences
-insuring aggregate risk
-proactive strategies

Cluster 2. Regional Decisions (RD)

-regional agreements (RA$_s$)
- Intra regional trade facilities
- improving electronic society
-participating in related regional congress
-unique currency
-geopolitics solutions
-confrontational index
-diplomatic process
-reforming the financial systems
-regional sharing experiences

Cluster 3. Global Decisions (GD)

-monetary policy
- Fiscal policy
- More cooperation with IAEA
-global agreements (GR$_s$)
-protectionist policies
-market control
-developing marketing methods
-convergence policies
-knowledge based policies
-Transparency and supervision increasing

Figure 6. Clusters and factors of AHP model

Evaluating Solutions

In this part we try to evaluate Iran decisions in front of economic sanctions using the AHP method as a good and significant evaluating method. The steps are as follows:
Step 1: The first step to select the best decisions due to the sanctions is to formulate a hierarchy. The first level of the hierarchy is used to define the overall goal, which is to identify the best and brilliant decisions to provide the most action in front of US economic sanction. The second level of the hierarchy is to determine the evaluation criteria (clusters and factors). The third level of the hierarchy is about alternative which is Iran. The hierarchy tree is designed as shown in Figure 7
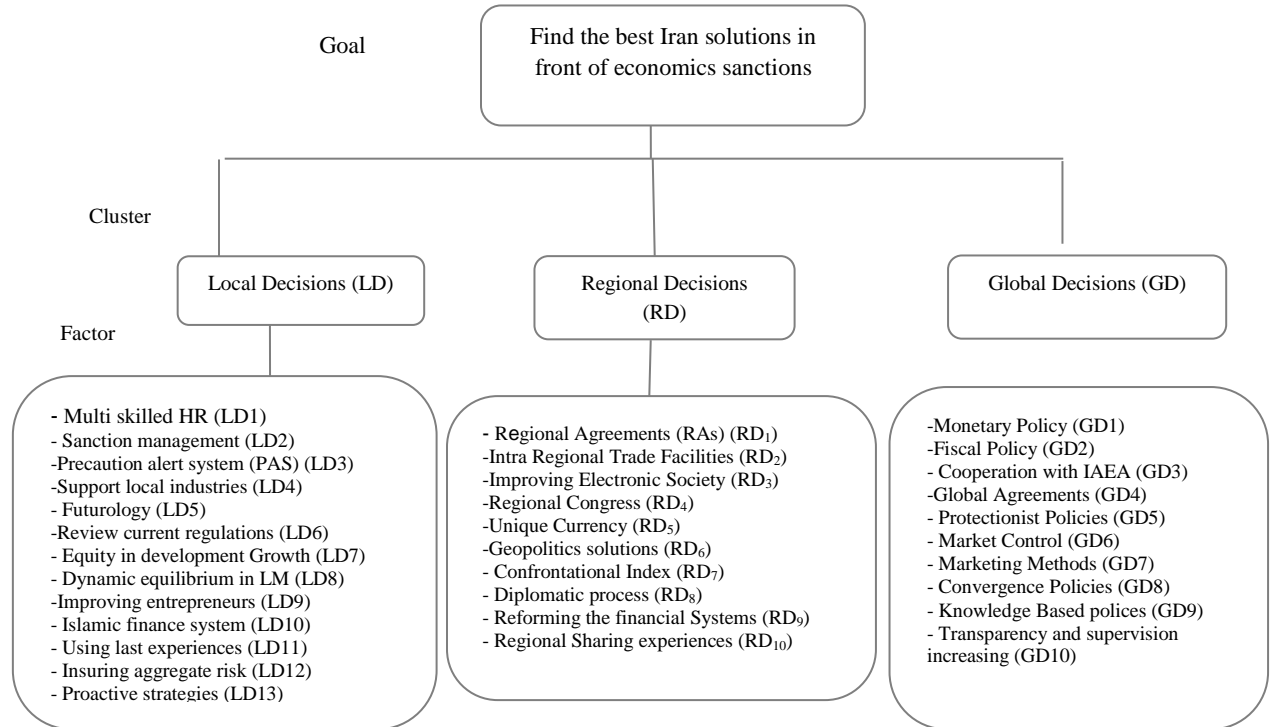
Figure 7. Hierarchy framework

Step 2: The second step is to elicit pair wise comparison judgments. After arranging the evaluation criteria in to a matrix, judgments about their relative importance with respect to the overall goal are elicited by asking questions that compare one criterion with another. The pair wise judgments are elicited from the experts' mind. Indeed, it is a principle in the AHP method that the judgments expressed in the form of comparisons are filled out by the experts. The pair wise comparison matrices are constructed for all 3 cluster and 33 criteria.

Step 3: In this step, the pair wise comparisons are ranked. To this purpose we normalized all achieved matrices in step 2 through the linear method. The levels in this method are:
a. Calculate summation of each column in pair wise comparison matrix
b. Divide column elements on summation of that column
c. Obtain a vector of priorities showing the relative weight of criteria. The calculated weights for each criterion are shown in Table 1.

Table 1. The calculated weights for each criterion

Criterion	Weight	Criterion	Weight	Criterion	Weight
LD_1	0.352	RD_1	0.279	GD_1	0.314
LD_2	0.381	RD_2	0.325	GD_2	0.271
LD_3	0.253	RD_3	0.196	GD_3	0.394
LD_4	0.261	RD_4	0.283	GD_4	0.358
LD_5	0.123	RD_5	0.152	GD_5	0.268
LD_6	0.320	RD_6	0.346	GD_6	0.317
LD_7	0.305	RD_7	0.212	GD_7	0.246
LD_8	0.196	RD_8	0.339	GD_8	0.188
LD_9	0.349	RD_9	0.364	GD_9	0.284
LD_{10}	0.293	RD_{10}	0.182	GD_{10}	0.205
LD_{11}	0.158	RD	0.114	GD	0.329
LD_{12}	0.447				
LD_{13}	0.165				
LD					

Step 4: Consistency Ratio (CRT) test. In the AHP method we gain a Consistency Rate (CR) through the Consistency Index (CI). The consistency index (table 2) of a matrix of comparisons is given by CI = (λmax − n) /(n −1) . The CR is obtained by comparing the appropriate one of the following set of numbers in Table 4, each of which is an average random consistency index (RI) derived from a sample of randomly generated reciprocal matrices $CR = \frac{CI}{RI}$.

Table 2. Average random consistency index

n	3	4	5	6	7	8	9	10	11	12	13	14
RI	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.19	1.51	1.48	1.56	1.57

If RI is not less than 0.1, study the problem and revise the judgments. The pair wise comparison matrix procedure which was done for criteria should be made for the alternatives in the systematic approach. The results of consistency ratio test for pair wise comparison matrices are shown in Table 3 . Since the CR is less than 0.1 for all alternatives, the truth of the judgments is accepted.

Table 3. The consistency ratio

Criterion	CR	Criterion	CR	Criterion	CR
LD_1	0.08	RD_1	0.09	GD_1	0.03
LD_2	0.06	RD_2	0.02	GD_2	0.02
LD_3	0.08	RD_3	0.01	GD_3	0.08
LD_4	0.01	RD_4	0.04	GD_4	0.02
LD_5	0.00	RD_5	0.00	GD_5	0.00
LD_6	0.03	RD_6	0.09	GD_6	0.08
LD_7	0.01	RD_7	0.05	GD_7	0.05
LD_8	0.05	RD_8	0.05	GD_8	0.02
LD_9	0.09	RD_9	0.01	GD_9	0.06
LD_{10}	0.00	RD_{10}	0.07	GD_{10}	0.01
LD_{11}	0.02				
LD_{12}	0.07				
LD_{13}	0.01				

The results of this study also are shown as a conceptual model.

Figure 8. Iran and Brilliant decision

By applying the AHP method, this paper investigated the rank of best Iran solutions during the economic sanctions. The criteria for our analysis are classified into three clusters as Local Decisions (LD), Regional Decisions (RD) and Global Decisions (GD).

This study had some limitations that should be revisited in future studies. Some of them are:

• We investigated these economic sanctions aggregately

• This paper did not include any opinion of the people

• Since the study is based on the AHP method, measurement instruments for each criterion were not developed.

• We suggest "Trend Analysis" and "Sensitivity Analysis" for covering the results.

Despite the limitations, the analysis showed several interesting results. First of all, the study found that the rank of assorted decisions as Local Decisions (LD), Global Decisions (GD) and Regional Decisions (RG). So the most important solution against economic sanctions for Iran is doing as local brilliant decisions .
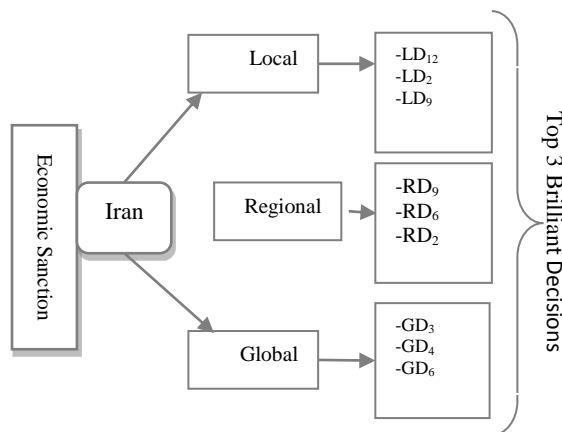
In related to factors, the top three decisions are insuring aggregate risk (LD12), more cooperation with IAEA (GD3) and sanction management (LD2). It is obvious that Iran should extent its cooperation with IAEA to gain their trust and care about total sanction risks. Moreover sanction management can control and accomplish desired goals and objectives besides nation's decisions.

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