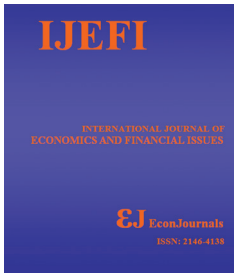

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Changing Priority of Industrial Activities in Sistan and Baluchestan Province (Application of Input-output Table)

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ABSTRACT

Given the Iranian economic vulnerability channels, strengthening the economy requires to develop production-oriented regional development plans as well as people-based and knowledge-based plans which are relied on domestic intermediate and capital goods. In order to prepare regional development plans according to resistive economy policies, the present study investigated changing ranking of industrial activities over the years 2005, 2009 and 2013 through integrating factor analysis method and numerical taxonomy, highlighting internal interactions of industrial activities and the interactions between industry sector and national economy. For this purpose, input-output table of Sistan and Balouchestan Province within the mentioned years was calculated by augmented Flegg's location quotient method. Given the findings, "production of food products and a variety of beverages and tobacco," "production of other non-metallic mineral products" and "production of basic metals" have experienced a growing degree of enjoyment within the studied years. Although quantitative objectives development for the industry section of Iran and thereby the provinces has not been considered in the fourth and fifth development plans to specify its achievement percentage, our findings-based priorities show alignment of the province's industry sector orientation and performance with the country's.

Keywords: Prioritization, Numerical Taxonomy, Factor Analysis, Input-output Table
JEL Classifications: E37, E32

1. INTRODUCTION

Along with other productive sectors, industry and mine sector is considered as one of the most important and greatest productive sectors (alongside the agriculture sector) in Iran in such a way that such a sector has occupied 17% of Iranian gross domestic product (GDP). Also, given the activities extent and the large number of production centers, this sector has been able to supply 63% of productive employment and 33% of employment entire the country. Therefore, it plays an important role in Iranian production and employment (Statistical Center of Iran, 2013). Hence, due to the importance and role played by this sector in the economy, it is taken into account as the most important area to achieve pre-planned goals for general policies of the resistive economy because it provides achievement potentials of the mentioned policies through several channels.

Since the industry sector owns a considerable share and capacity in Iranian economy, it is the most important economic sector to achieve dynamic growth and improved resistive economy indicators because this sector serves as an intermediate with other sectors in Iranian economic chain and growth and prosperity in this sector extends to other sectors. Since the resistive economy policies mainly aim to provide the conditions for dynamic growth and economic indicators improvement, this sector plays a considerable role to achieve determined goals through knowledge-based economy development and proper use of scientific and technical potentials in Iran. However, as Iran is located on Third World Circuit and its dependencies, this sector is dealt with high vulnerabilities versus external conditions including sanctions and economic global crises. Therefore, strengthening the industry sector not only minimizes the problems resulted from the sanctions and limitations, but also it can make the industry and production as most influential economic sector in Iran by

improved conditions and decreased dependency on petroleum incomes.

Sistan and Balouchestan has an under 16-years population of 35% which in turn requires serious determination in order to plan for career prospects and social future. As the connection ring of other provinces and countries to pole of the world's population (namely India and China), this province itself can lead to develop the economy and make fair competition. Enjoying the special status of the province due to its proximity to Pakistan and Afghanistan and some industrial, productive and service access points are also of the capabilities in the way of economic growth and development. Therefore, in order to employ these capabilities in the province and solve unemployment problem as well as accelerate development process of the country, suitable mechanisms are required to provide potentials of public entrance in industrial field.

Given the climate change and reduces role of agriculture in the province, the government can lead to flourish the production by the supports they may do in these regions from industrialists. In order to present coherent plan in the field of industrial development of the province, identification of industrial capabilities is required in the field of employment and value creation. Awareness of available advantages in the provinces and prioritization of each industrial activity not only helps to lead governmental investments towards the activities with higher profitability and employment, but also results in correct guidance of industrial investments in private sector towards such activities. In doing so, present study aims to investigate changing prioritization of industrial activities of Sistan and Balouchestan Province within the years 2005-2013because recognition and analysis of the current status are the first step to develop proper policies for achievement of resistive economy.

Some studies have been conducted regarding prioritization of industrial activities which are pointed briefly in Table 1.

In addition to identification of production, employment and value-added indicators, present study separates industrial activities of Sistan and Balouchestan province in order to highlight the way of the interactions regarding industrial activities inside the province as well as those associated with other provinces. Using national input-output table and augmented Flegg's location quotient method, provincial tables in the years 2005, 2009 and 2013 were calculated and such indicators as output value of the province, share of total output value of the province, share of output value of activity entire the country, share of GDP of the province, share of value added of national activity, value added of the province, industrial productivity, share of the internally financed intermediate cost from total intermediate cost, share of the externally financed intermediate cost from total intermediate cost, share of the intermediate cost financed through other provinces from total intermediate cost, share of the intermediate cost financed through other countries from total intermediate cost, share of intermediate cost from provincial production, share of the intermediate supply inside the province from total supply, share of final supply in the province from total activities share in intermediate export (to other provinces or abroad), share of activity in intermediate export to other provinces, share of activity in intermediate export to abroad were investigated and then prioritized using factor analyses and numerical taxonomy of industrial activities (separated by two-digit codes ISIC).

2. INDUSTRY SECTOR IN SISTAN AND BALOUCHESTAN PROVINCE

Some indicators are pointed out here to present an imagination of the industry in Sistan and Balouchestan. In terms of value-added, the provincial industry has occupied a small share of the national industry and this share has been varied during the studied years from 0.53% in 2005 to 0.46% in 2009 and 0.48% in 2013 (Table 2). However, value-added of the provincial industry has experienced a growing trend as in that of national industry.

Table 3 compares the investments for provincial and national industrial workshops. The investments on industrial workshops in both the province and the country had an increasing trend which got to a decreasing trend in the next years. This reduction was due to consequences of 2007 financial crisis and the sanctions applied versus Iran.

Table 1: Previous studies on the industries prioritization in the provinces

Authors	Location	Year	Method of calculation	Industrial activities
Sanayei and Moallem (2011)	Isfahan	1995-1999	Factor analysis method and numerical taxonomy	Production of basic metals, production of coke, oil refineries and nuclear fuels, production of chemical products
Tari and Jalilian (2002)	Fars	1993, 1995 and 197	Numerical taxonomy	Chemical industries Food industries
Akbari and Moradi (2008)	Kurdistan	2004	Factor analysis method and numerical taxonomy	Non-metallic mineral industry, the grain crops and cereals industry, plastic industry, stone cutting and textile
Keihani and Fat'hi (2010)	Hamedan	2003	Factor analysis method and numerical taxonomy	Production of other non-metallic mineral products, production of food and beverages, and other machinery classified nowhere else
Dizaj and Sabouri (2002)	Guilan	2001 and 2009	Factor analysis method and numerical taxonomy	Production of dairy products, spinning and weaving, production of other textiles, garment manufacturing
Aghamaleki et al. (2003)	Golestan	2006 and 2009	Factor analysis method and numerical taxonomy	Food and beverage industries, production of wood and wood products

Also, the relative distribution of employment in the industry sector shows to be 33.9% in 2005 and 18.7%, 16.2%, 11.2%, 13.9% and 10% for the years 2009-2013, respectively. It shows decreased share of this sector in provincial employment (Statistical Yearbook of the Province, 2013). The assessment on industrial activities value-added in the province (Table 4) shows that generally value-added of the province had a mean growth of 56% within the years 2005-2013. Among the different activities associated with this sector, the highest growth respectively pertains to recycling, production of chemical materials and chemical products, production of food products, beverages, tobacco and finally non-metal mineral products with a growth of 47%, 27%, 22% and 21%. Table 4 presents value-added of industrial activities across the province (Scale: Million Rial).

Table 5 presents efficiency of industrial activities within the studied years. The efficiency is calculated by the activity's intermediate consumptions to output ones ratio. In doing so, the higher intermediate consumption from output, the higher production cost or the lower production efficiency and thereby the lower value-added is generated and lower relative advantage is shown. The output means goods or services which are provided by a production site and gets available to be used outside and intermediate consumption means value of goods or services which are consumed as input of a production process in that process. In major of industrial activities, the efficiency was decreased from 61% in 2005 to 60% in 2009 and then increased to 62% in 2013. Therefore, production efficiency in this activity has been generally lowered within the studied period. The highest and lowest efficiencies in 2005 are associated with non-metal mineral products and food products, beverages and tobacco, respectively. In 2013, efficiency of non-metal mineral products was decreased while that of food products, beverages and tobacco was somewhat increased.

Table 2: Value-added of the provincial industry compared to that of national industry (Million Rials)

Location	2005	2009	2013	Average growth rate
Provincial	1,350,020	2,312,230	7,119,553	19
National	250,220,352	490,846,501	1,460,826,166	22
Share (%)	0.53	0.46	0.48	-

Resource: Regional accounts, Statistical Center of Iran

Table 3: Comparison of provincial and national investments on industrial workshops

Location	2005	2009	2013
Sistan and Balouchestan (Million Rial)	301,980	1,914,108	974,466
Iran (Billion Rial)	55,181	20,7403	86,260

Resource: Statistical Yearbook of the Province and Country

3. METHODOLOGY

In order to compare diverse activities in terms of value of one/few prioritized indices, several scientific methods are available such as numerical taxonomy, factor analysis, coefficient of deprivation index, cluster analysis, Maurice model and standard dataset method. In doing so, numerical taxonomy analysis is one of the most conventional ranking method which most recently has been paid into attention and used by the planners; however, due to its disadvantages, direct use of such a method seems to be irrational. The disadvantages include not considering the correlations between indicators in analysis and ranking while the indicators are place next to each other which define each other and thereby distort the analysis results. In order to eliminate this problem, the factor analysis method is used

Table 4: Value added of industrial activities in the province (scale: Million Rial)

Industrial activities	2005	2009	2013	Average growth 2005-2013
Industry	133,020	2,374,444 (78.8)	7,119,553 (6.24)	56
Production of food products, beverages and tobacco	485,741	858,081 (12.1)	3,319,155 (31.1)	23.8
Textiles, clothing and leather	263,440	189,688 (−6.4)	360,922 (13.7)	3.6
Production of wood and wooden products	36890	77,741 (16.1)	196,932 (20.4)	20.5
Production of paper and publishing products	3120	37,276 (64.2)	13,351 (−18.6)	17.5
Production of coke, the products derived from petroleum refinement and nuclear fuels	1027	0	0	-
Production of chemical materials and chemical products	7908	22,519 (23.3)	74,013 (26.9)	28.2
Production of rubber and plastic products	51,235	47,268 (15.5)	97,169 (−1.6)	7.4
Production of other mineral non-metal products	355,154	662,325 (13.3)	2,284,372 (28.1)	23
Production of basic metals	758	31,036 (110.1)	1811 (−43.3)	10.2
Production of original metal products except machineries and equipment	118,029	288,017 (19.5)	584,533 (15.2)	19.5
Production of the machineries and equipment classified nowhere else	6483	1151 (−29.2)	26,328 (87)	16.8
Production of office, accounting and computational machinery	-	0	0	0
Production of electrical machineries and devices classified nowhere else	6382	18,982 (24.4)	27,387 (7.6)	17.6
Production of radio, TV and communicational devices	-	0	1104	-
Manufacturing medical instruments, optical instruments, precision instruments and a variety of watches	779	1969 (20.4)	4880 (19.9)	22.6
Production of motor vehicles, trailers and semi-trailer	1137	2975 (21.2)	2713 (−1.8)	10.1
Production of other transportation equipment	3502	3610 (0.6)	6413 (12.2)	7
Manufacturing the furniture and artifacts classified nowhere else	34,789	66,986 (14)	97355 (7.8)	12.1
Recycling	646	4430 (47)	21,108 (36.6)	47.3

Resource: Regional Accounts, Statistical Center of Iran and precise calculations (the numbers inside the parentheses show growth of each period)

Table 5: Productivity of the industry and corresponding sub-activities within 2005-2013 (unit :%)

Industrial activities	2005	2009	2013
Industry	61	60	62
Production of food products, beverages and tobacco	72	70	71
Textiles, clothing and leather	53	55	48
Production of wood and wooden products	46	46	36
Production of paper and publishing products	55	19	48
Production of coke, the products derived from petroleum refinement and nuclear fuels	70	-	-
Production of chemical materials and chemical products	57	57	68
Production of rubber and plastic products	61	71	63
Production of other mineral non-metal products	39	38	42
Production of basic metals	93	2	68
Production of original metal products except machineries and equipment	60	60	58
Production of the machineries and equipment classified nowhere else	53	53	53
Production of office, accounting and computational machinery	-	-	-
Production of electrical machineries and devices classified nowhere else	53	52	52
Production of radio, TV and communicational devices	-	-	35
Manufacturing medical instruments, optical instruments, precision instruments and a variety of watches	46	46	45
Production of motor vehicles, trailers and semi-trailer	56	56	56
Production of other transportation equipment	57	57	57
Manufacturing the furniture and artifacts classified nowhere else	60	61	60
Recycling	65	64	62

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which is able to extract the factors with the lowest correlation (Dizaj and Sabouri, 2012. p. 135).

In present study, a combination of factor analysis and numerical taxonomy is used in such a way that strengths of each method are maintained and the weaknesses are eliminated. Initially, using input-output table and statistical yearbooks of the province, some indicators associated with each industrial activity are extracted and then information refinement is conducted in terms of the correlation between data (indicators) by factor analysis method and finally consolidated factors are extracted. In this method, the problem of uniform importance coefficient of indicators and used variables is solved. In the next step which is ranking the regional industries, results of factor analysis are used as data for numerical taxonomy and thereby lots of disadvantages regarding the numerical taxonomy (e.g., the correlation between indicators and variables) are eliminated. Therefore, factor analysis and numerical taxonomy are the main techniques for data refinement, ranking and grouping the industries.

Table 6: Results of Bartlett test and KMO

Year	KMO value	Bartlett test	
		Chi-square value	Significant value
2005	0.642	410.554	0.000
2009	0.671	319.982	0.000
2013	0.721	641.977	0.000

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Table 7: Factors extraction

Year	Factor	Eigen value	% of variance	% of cumulative variance
2005	1	4.546	32.421	32.421
	2	5.004	20.824	53.245
	3	1.973	14.347	67.592
	4	1.570	12.113	79.705
	5	1.192	10.768	90.473
2009	1	5.543	58.541	58.541
	2	1.126	24.824	83.365
2013	1	6.736	34.77	34.77
	2	5.102	24.867	59.644
	3	1.824	13.146	72.790
	4	1.375	10.749	83.539

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4. ANALYSIS OF INDUSTRIAL ACTIVITIES DATA

Under an assumed model, factor analysis sets up a specific relation between a set of the variables seemingly unrelated. In other words, it tries to explain correlation pattern in distribution of a visible random vector in terms of the minimum invisible random variables as the factors. Then, using factor analysis method and through the software SPSS, analysis and identification of consolidated factors and their extraction from the primary indicators used in this study are conducted for the desired years. Since the indicators have different scales, the data will be normalized for future calculations. As the next step, Bartlett test and KMO are used to determine if factor analysis can be carried out by existing data or not. Results of these tests are stated in Table 5. Given the results of Table 6, since KMO is >0.5, value of this statistics is reasonable in terms of factor analysis and is close to the average. Also, since significant value of Bartlett test is obtained lower than 0.05, the hypothesis of equal unit matrix and correlation coefficients matrix is approved. In fact, it can be concluded that all indicators act independently of each other. With respect to approval of KMO and Bartlett, data is suitable for factor analysis.

In order to assess how correlated are the indicators used for prioritization of industries and how many factors can be handled by these indicators, the results of Table 7 are used. Since following the analysis number of Eigen values >1 is 5, therefore these eighteen indicators are able to measure four factors. Also, the cumulative variance of these five factors was obtained 90% which is a very suitable value and indicates that such five factors or components explain totally 90% of total expressed variance and thereby these factors are considered as the main ones.

According to 2005 rotated component matrix presented in Appendix Tables 1 and 2, such indicators as provincial output value, share from total provincial output value, share from

provincial gross production, share from national activity output value, provincial value-added, employment level, share of the internally financed intermediate cost from total intermediate cost of the Factor 1, share of the externally financed intermediate cost from total intermediate cost, share of the intermediate cost financed through other provinces from total intermediate cost, share of intermediate cost from provincial production, share of final supply in the province from total of the Factor 2, share of activity in intermediate export (other provinces and abroad), share of activity in intermediate export to other provinces of the Factor 3, share of intermediate supply inside the province from total, share of activity in intermediate export to abroad of the Factor 4, share from national activity output value, and share from national activity value added in 2005, measure the Factor 5.

Also in 2013, such indicators as provincial output value, share from total provincial output value, share from provincial gross production, share from national activity output value, provincial value-added, employment level, share of the internally financed intermediate cost from total intermediate cost of the Factor 1, productivity indicators, share of the externally financed intermediate cost from total intermediate cost, share of the intermediate cost financed through other provinces from total intermediate cost, share of intermediate cost from provincial production, share of final supply in the province from total of the Factor 2, share of activity in intermediate export (other provinces and abroad), share of activity in intermediate export to other provinces of the Factor 3 as well as share of intermediate supply inside the province from total, share of activity in intermediate export to abroad measure the Factor 4. Therefore, for more precise data analysis and better use of taxonomy, instead of prioritization of industries according to 18 indicators, they are prioritized according to five factors in 2005, two factors in 2009 and four factors in 2013.

In order to reach input data of the taxonomy method, the values obtained in annual rotated component matrix are multiplied in normal data values pertaining to the indicators so that score of each industry can be derived regarding each factor. Then, the derived data will be standardized once more. Following standardized input data derivation using factor analysis for the taxonomy method, the next steps of taxonomy will be proceeded.

The first step is to calculate the combined distances between the regions (industries) and determined the shortest distances. After drawing the distances matrix, cells of this matrix show combined distance of each activity from another activity and in each row of this matrix, the lowest value indicates the shortest distance between that activity with other activities and/or the highest neighborhood.

The next step is to determine homogeneity regions to separate homogenous industries from heterogeneous one in 2005. In order to find this region, initially the shortest distance is found and written in a separate column. Then by mean and standard deviation of that column values and through above equation, upper limit d (+) and lower limit d (−) are derived. Now, the activities between upper and lower limits are homogenous and place into a group and the rest are eliminated. In 2005, the mean shortest rows distance and standard deviation are respectively 0.7528 and 0.6477 for 2005, 1.2382 and 2.8390 for 2009 and 2.8898 and 3.7825 for 2013.

$$d(+) = AVR + 2SD$$

$$d(-) = AVR - 2SD$$

Based on above equation and calculations for 2005, the upper and lower limits were derived 2.048 and 0.542, respectively. Accordingly, since all values of the industries office, accounting and computational machinery as well as recycling are lower than the lower limit, therefore they are not homogenous to other industries and thereby they were eliminated from the analysis which since then will proceed on 17 industries. Since these two industries have the values lower than the lower limit, they enjoy an unsuitable status in Sistan and Balouchestan Province.

In 29, the upper and lower limits were derived 6.916 and −4.439, respectively. Therefore, the industries whose factors are either higher than the upper limit or lower than the lower limit, are eliminated. Accordingly, since the industry food products, beverages, tobacco owns the values higher than the upper limit for both factors (i.e., Factor 1: 17.5003 and Factor 2: 7.593). Consequently, this industry has a much better status in terms of these two factor and is not considered in homogeneity area of other industries and thereby is eliminated from analysis which will be conducted on 18 industries from here onwards.

In 2013, the upper and lower limits were derived 10.455 and −4.6752, respectively. Accordingly, since the industry food products, beverages, tobacco owns the values higher than the upper limit (Factor 1: 22.71) and the industries pertaining to coke, the products derived from petroleum refinement and nuclear fuels (Factor 2: −11.18) and recycling (Factor 2: −8.83) have the values lower than the lower limit; therefore, these three industries have a heterogeneous status and thus are eliminated from the analysis which will be done on 16 industries. It can be concluded that food products and beverages industry have a very satisfying status in Sistan and Balouchestan Province while production of coke, the products derived from petroleum refinement and nuclear fuels as well as the recycling are in unsuitable status.

Upon removal of heterogeneous activities, input data of taxonomy analysis is re-standardized. Next, the greatest number in each column of the derived matrix is considered as ideal point or industry and the combined distance of each point (activity) from the ideal point (activity) is calculated according to below equation:

$$C_{io} = \sqrt{\sum (Z_i - Z_o)^2}$$

C_{io}: Combined distance of a point from ideal point,
Z_i: The values inside the standard matrix,
Z_o: Ideal values of each column in the standard matrix.

After calculation of combined distance of each point from the ideal point (C_{io}), annual enjoyment degree of each industry is found by the indicators or factors studied in present work. This value is derived through the following equation:

$$F_i = \frac{C_{io}}{C_o}, C_o = \overline{C_{io}} + 2SD_{io}$$

C_{io}: Mean value of the model of development column C_{io},
SD_{io}: Standard deviation of the column $C_{io.}$

Based on the calculations associated to 2005, mean value of the column C_{io} and standard deviation were derived 5.601 and 0.998, respectively. Therefore, the value of C_o is 7.598 according to above equation. In 2009, mean value of the column C_{io} and standard deviation were derived 3.441 and 1.213, respectively. Therefore, the value of C_o is 5.868 according to above equation. Also in 2013, mean value of the column C_{io} and standard deviation were derived 4.173 and 1.116, respectively, thus the value of C_o is 6.407.

Enjoyment degree of each activity is presented in Table 8. F_i permanently fluctuates between 0 and 1. The F_i closer to zero, the higher enjoyment degree here and vice versa.

According to the analyses, the industries recycling and production of office, accounting and computational machineries were eliminated from the analysis due to have a very low enjoyment degree and being heterogeneous relative to other industries. Among 17 remained industries, the industry "production of other non-metal mineral products" and "production of coke, the products derived from petroleum refinement and nuclear fuels" have respectively the highest and the lowest enjoyment degree in 2005. In 2009 and 2013, the industry "production of food products, beverages and tobacco" owns the highest enjoyment degree which is much higher than that of other industries and has no heterogeneity to other industries and for this reason, it was eliminated from taxonomy analysis. According to output of taxonomy analysis for 2009, the industry "production of other non-metal mineral products" was the lowermost with an enjoyment degree of 0.1571 and the industries "production of coke, the products derived from petroleum refinement and nuclear fuels" and "manufacturing medical instruments, optical instruments, precision instruments and a variety of watches" were the uppermost with an enjoyment degree of 0.8024. Also in 2013, the industry "production of other non-metal mineral products" was the most enjoyed with a degree of 0.337 and the industry "production of office, accounting and computational machinery" was the least one with an enjoyment degree of 0.9040. Table 9 shows classification of industrial activities at diverse years in terms of enjoyment degree. Also, enjoyment degree variation can be seen in Table 10 separated by the studied years.

5. CONCLUDING REMARKS

Experience of negative growth rate during the period of economic sanctions (particularly petroleum and its products sanctions) indicates that Iranian economy is still suffering from low-quality growth which is based on the investments derived from oil revenues. Achievement of sustainable growth rates and restrictive economy policies requires attention to the difference in capabilities and potentials in diverse regions of the country. According to the need for preparation of regional development plans and establishing the position of each region in achieving the resistive economy, the present study investigates variation of industrial activities prioritization in Sistan and Balouchestan province over the fourth

Table 8: Enjoyment degree of each industrial activity

sub-activities	Industrial activity	Fi		
		2005	2009	2013
S1	Production of food products, beverages and tobacco	0.727305	-	
S2	Textiles, clothing and leather	0.691718	0.2875	0.751857
S3	Production of wood and wooden products	0.629938	0.3605	0.578421
S4	Production of paper and publishing products	0.745317	0.6828	0.594389
S5	Production of coke, the products derived from petroleum refinement and nuclear fuels	0.95826	0.8024	0.591627
S6	Production of chemical materials and chemical products	0.739175	0.6652	0.543973
S7	Production of rubber and plastic products	0.598182	0.5071	0.377569
S8	Production of other non-metal mineral products	0.517504	0.1571	0.465843
S9	Production of basic metals	0.761008	0.7728	0.717553
S10	Production of original metal products except machineries and equipment	0.723376	0.1918	0.706029
S11	Production of the machineries and equipment classified nowhere else	0.782954	0.6768	0.861743
S13	Production of electrical machineries and devices classified nowhere else	0.685401	0.8022	0.568024
S14	Production of radio, TV and communicational devices	0.702839	0.6713	0.584147
S15	Manufacturing medical instruments, optical instruments, precision instruments and a variety of watches	0.791719	0.8024	0.695887
S16	Production of motor vehicles, trailers and semi-trailer	0.819376	0.7057	0.779498
S17	Production of other transportation equipment	0.705286	0.6961	0.566723
S18	Manufacturing the furniture and artifacts classified nowhere else	0.75253	0.6638	
S19	Recycling	-	0.5713	-

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Table 9: Classification of the industries in terms of enjoyment degree

Year	Enjoyment			
	Very high 0-0.25	High 0.25-0.5	Low 0.5-0.75	Very low 0.75-1
2005	-	-	S1, S2, S3, S4, S6, S7, S8, S10, S13, S14, S17	S5, S9, S11, S15, S16, S18
2009	S8, S1, S10	S2, S3	S7, S18, S19, S17, S6, S13, S11, S4, S16, S15	S9, S5, S12, S14
2013	S1	S8, S9	S7, S17, S13, S3, S14, S6, S4, S15, S11, S10, S18	S2, S16, S12

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Table 10: Enjoyment degree variation for provincial industrial activities within the years 2005-2013

sub-activities	Industrial activities	Enjoyment degree		
		2005	2009	2013
S1	Production of food products, beverages and tobacco	Low	Very high	Very high
S2	Textiles, clothing and leather	Low	High	Very low
S3	Production of wood and wooden products	Low	High	Low
S4	Production of paper and publishing products	Low	Low	Low
S5	Production of coke, the products derived from petroleum refinement and nuclear fuels	Very low	Very low	Very low
S6	Production of chemical materials and chemical products	Low	Low	Low
S7	Production of rubber and plastic products	Low	Low	Low
S8	Production of other non-metal mineral products	Low	Very high	High
S9	Production of basic metals	Very low	Very low	High
S10	Production of original metal products except machineries and equipment	Low	Very high	Low
S11	Production of the machineries and equipment classified nowhere else	Very low	Low	Low
S13	Production of electrical machineries and devices classified nowhere else	Low	Low	Low
S14	Production of radio, TV and communicational devices	Low	Very low	Low
S15	Manufacturing medical instruments, optical instruments, precision instruments and a variety of watches	Very low	Low	Low
S16	Production of motor vehicles, trailers and semi-trailer	Very low	Low	Very low
S17	Production of other transportation equipment	Low	Low	Low
S18	Manufacturing the furniture and artifacts classified nowhere else	Very low	Low	Low
S19	Recycling	Very low	Low	Very low

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development plan and the first 2 years of fifth development plan based on factor analysis and numerical taxonomy. The studied variables were selected in such a way to include value-added, employment, efficiency and internal interactions between diverse industrial activities in the province as well as interactions of these activities with national economy. The findings show that within the mentioned years and based on the variables, the industry "production of food products and beverages" has been enhanced from a low enjoyment status in 2005 to a very high enjoyment status in 2009 and 2013 years. In addition, the industry "production of other non-metal mineral products" has also been varied from a low enjoyment status in 2005 to a very high enjoyment status in 2009 and 2013 years. However, although the industries "production of wood and wooden products" and "production of original metal products except machineries and equipment" have improved their enjoyment degree in 2009, they have re-degraded to a low enjoyment status in 2013. Other industrial activities experience no significant change. The assessments on the national industry status show that within the two first years of fifth development plan, industrial investments dominantly tend to food industries, non-metal mineral industries and basic metals industries according to which a part of the fifth plan's objectives (i.e., development of intermediate downstream industries value chain) has been achieved.

In terms of consumed energy of industrial workshops within the years 2006-2011, the groups "production of other non-metal mineral products," "production of basic metals" and "production of chemical materials and products" have had the highest energy consumption after that the groups "production of coke and oil refineries" and "food products and beverages" are in the next level of consumption (Energy Balance Sheet, 2011). Use of clean energies in Sistan and Balouchestan Province can be effective on decreased price of enjoyed industrial activities final products and increased national and regional competitiveness.

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APPENDICES

Appendix Table 1: Table of 2005 rotated component matrix

Indicators	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Provincial output value in 2005	0.967	−0.023	−0.062	−0.158	−0.081
Share from total provincial output value in 2005	0.952	0.037	−0.001	−0.151	−0.087
Share from national activity output value in 2005	0.791	0.099	−0.113	0.014	0.525
Share from provincial gross production in 2005	0.935	−0.038	−0.133	−0.018	−0.038
Share from national activity value-added in 2005	0.225	0.195	−0.045	0.013	0.864
Provincial value-added in 2005	0.829	−0.007	−0.087	0.046	0.444
Industrial productivity in 2005	0.183	−0.223	0.250	−0.800	0.007
Employment level in 2005	0.888	−0.051	0.008	0.036	0.342
Share of the internally financed intermediate cost from total intermediate cost	0.773	0.448	0.028	−0.063	0.276
Share of the externally financed intermediate cost from total intermediate cost	−0.095	0.905	0.325	0.117	0.135
Share of the intermediate cost financed through other provinces from total intermediate cost	0.074	0.762	0.363	0.130	0.335
Share of the externally financed intermediate cost from total intermediate cost	−0.278	0.754	0.199	0.186	−0.240
Share of the intermediate cost from provincial production	0.351	0.804	0.331	0.207	0.081
Share of intermediate supply inside the province from total	0.006	0.136	0.242	0.901	0.155
Share of final supply in the province from total	0.318	0.764	−0.487	0.204	0.054
Share of activity in intermediate export (other provinces and abroad)	−0.085	0.323	0.926	0.040	−0.081
Share of intermediate export to other provinces	−0.099	0.272	0.935	0.096	−0.056
Share of intermediate export to abroad	−0.070	0.220	0.247	0.716	−0.528

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Appendix Table 2: Table of 2013 rotated component matrix

Indicators	Factor 1	Factor 2	Factor 3	Factor 4
Provincial output value in 2013	0.877	0.029	−0.273	−0.085
Share from total provincial output value in 2013	0.829	0.131	−0.329	−0.106
Share from national activity output value in 2013	0.527	0.156	−0.406	−0.135
Share from provincial gross production in 2013	0.927	0.103	−0.008	−0.184
Share from national activity value-added in 2013	0.948	−0.060	−0.021	0.090
Provincial value-added in 2013	0.951	−0.058	−0.024	0.087
Industrial productivity in 2013	0.286	0.698	0.103	−0.182
Employment level in 2013	0.879	0.095	0.270	−0.193
Share of the internally financed intermediate cost from total intermediate cost	0.772	0.470	−0.083	−0.024
Share of the externally financed intermediate cost from total intermediate cost	−0.065	0.934	0.161	0.145
Share of the intermediate cost financed through other provinces from total intermediate cost	0.165	0.813	0.269	0.145
Share of the externally financed intermediate cost from total intermediate cost	−0.365	0.751	−0.019	0.253
Share of the intermediate cost from provincial production	0.322	0.837	0.167	0.287
Share of intermediate supply inside the province from total	0.020	0.163	0.086	0.913
Share of final supply in the province from total	0.263	0.647	−0.608	0.197
Share of activity in intermediate export (other provinces and abroad)	−0.082	0.478	0.822	0.146
Share of intermediate export to other provinces	−0.079	0.424	0.857	0.187
Share of intermediate export to abroad	−0.252	0.213	0.123	0.813

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