Research on Algorithm for Consistent Fit or Unfit Sorting Sector and Match Measurement between Plan and Environment

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***Abstract*—Multi-objective decision-making can be divided into two categories: (1) First select some evaluation attributes, then evaluate the pre-programs under these evaluation attributes, and finally using certain methods to fuse the evaluation information; (2) Since the preselected programs in a same external environment, how to select the most pre-match program matching with the external environment. But present research about the later decision-making question is few. This article has conducted some research to this kind of policy-making question As a result of each preselected plan own characteristic, condition-performance functions of various environment condition factor to each preselected plan existence difference. Thus causes not be able to only depend on the value of environment condition factor to judge each preselected plan fit and unfit quality under this environment condition, but must carry on the overall evaluation according to the value of environment condition factor and the condition-performance function. In this article, firstly construct an algorithm to seek consistent fit and unfit quality sorting sector. Then based on these consistent fit and unfit quality sorting sectors, construct a match measurement operator to measure the match degree between each preselected plan and the external environment. The preselected plan owning the biggest match degree is the best plan under this environment condition.**

***Index Terms*—Match Measurement, Confidence Level, Consistent Sorting Sector**

I. INTRODUCTION

Decision theory's production and development is the objective need of socialization production and the socialized production impetus result. The so-called decision-making, according to the result by analyzing and forecasting to the related activity, to achieve the specific goal, using science's theory and the method to analyze the subjective and objective condition systematically, in n ($\geqslant$2) undetermined feasible preselected plan, is to select best or a satisfaction implementation plan. Decision-making correct or not, regardless of the macro, middle and micro socio-economic system, the size of social benefits, social good or bad, high or low economic returns are significant. Scientific decision-making is the basis of scientific management and an important measure of the basic scale to the level of scientific management. In the later years, decision Suppose System is playing an important role in computer science, technology and engineering, while intelligent decision-making is one of the current hotspots. Intelligent decision-making method and its algorithms are one of the most important basics and key cores in current computational technologies, such as intelligent information processing, intelligent pervasive computing and so on. The multi-objective decision making question is the hot spots in decision-making science, systems engineering, management science and so on, also has a very extensive and important uses in real life. Multi-objective decision-making can be divided into two categories: (1) First select a number of evaluation attributes, then evaluate the pre-programs under these evaluation attributes, and finally using certain methods to fuse the evaluation information, and then get the integrated programs' evaluation value; (2) Since the pre-selection programs in a common external environment, when the external environment prior to accurately or (vague) prediction, how to select the most pre-match program matching with the external environment. Literature [1] - [14] have conducted the research to the first type's policy-making question, and

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construct some policy-making algorithms. However, in actual decision-making, the second kind of policy-making question is also a kind of common policy-making question, but present research about this kind of decision-making question is few. This paper has conducted some research to this kind of policy-making question, firstly for the isomerism condition-performance function, construct an algorithm to get consistent fit and unfit quality sorting sector to the pre-selected programs under each environment condition factor's various condition. Then based on these consistent fit and unfit quality sorting sector, constructed a match measure operator to measure match degree between each preselected plan and the specific environment condition, and to select the best programe with the biggest matching degree to the specific environment. When the environment condition is explicit, this kind of decision-making is relatively simple. In this paper, conduct the research on the preselected plan's selection decision-making question under the fuzzy environment condition.

II. CONSTRUCT ALGORITHM FOR GAINING CONSISTENT FIT AND UNFIT QUALITY SORTING SECTOR

This paper mainly conducts the research to the preselected plan's selection decision-making question under the condition that the condition - performance function is the linear function. Suppose $B=\{B_1,B_2, \dots ,B_n)$ as the preselected plan collection, $U=\{u_1,u_2, \dots ,u_m\}$ as the environment state factors collection, the value of environment condition factor u_j recorded as v_j, the preselected plan B_i condition - performance function is $f_{ji}(x)=a_{ji}\times x+b_{ji}$ to the environment condition factor u_j, the sector vaiue of environment condition factor u_j is D_j, $(j=1,2,\dots,m)$, $(i=1,2,\dots,n)$. Obviously so long as each preselected plan's condition-performance function to various environment condition factor is identified, each preselected plans' consistent fit and unfit quality sorting sector also immediately determined under various conditions factor's various condition. Before structure algorithm for gaining consistent fit and unfit sorting sector, firstly certificate the following proposition.

The proposition 1: In the two dimensional plane, any two straight lines f_1 and f_2 which do not coincide with each other. If do not intersect with each other in the interval $[a,b]$, then in the interval $[a,b]$, $f_1 > f_2$ establishes permanently or $f_1 < f_2$ establishes permanently, namely the sequences were consistent.

Proof: Using reduction to absurdity

The supposition has two spots $x_1,x_2 \in (a,b)$, $f_1(x_1) > f_2(x_1)$, and $f_1(x_2) < f_2(x_2)$ all established.

Construct function $f_3(x)=f_1(x)-f_2(x)$, as two functions f_1 and f_2 are linear functions, so function f_3 is continuous function within the closed interval $[x_1,x_2] \subseteq [a,b]$.

As $f_1(x_1) > f_2(x_1)$, $f_1(x_2) < f_2(x_2)$

May result in:

$f_3(x_1)=f_1(x_1)-f_2(x_1)>0$, $f_3(x_2)=f_1(x_2)-f_2(x_2)<0$, may result in by continuous function's nature: In the sector $(x_1,x_2) \subseteq [a,b]$, must have a spot x_0 to have $f_3(x_0)=f_1(x_0)-f_2(x_0)=0$, this obviously contradict with that two straight lines f_1 and f_2 does not intersect with each other in the sector $[a,b]$, therefore the supposition untenable, original proposition is tenable.

Obviously, may obtain the following proposition by the proposition 1:

The proposition 2: In the two dimensional plane, any n straight lines f_1, $f_2, \dots, f_n$ which do not coincide with each other. If do not intersect with each other in the interval $[a,b]$, then in the interval $[a,b]$, corresponding to those straight lines, the homographic functions' size relations' sorting is consistent.

Algorithm for gaining Consistent fit and unfit quality sorting sector

Take the environment condition factor u_j as the example:

Making up all two-combination from n condition-performance functions will obtain C_n^2 equation sets. In solving each of these equation sets, if one equation set has the infinite multi-solutions, does not consider this equation set's solution. Only need to consider that has the only solution equation sets, and constitute x coordinate figure of these equation set solution as a set $E=\{e_{1j},e_{2j},\dots,e_{tj}\}$.

(2) Divide the sector D_j with the spots in the set E, then obtains $t+1$ sub-sectors $D_{j1},D_{j2},\dots,D_{jt+1}$.

May known by the proposition 2 that the n state-performance functions $f_{j1},f_{j2}, \dots ,f_{jn}$ have the uniformity size sorting in such sub-intervals. Therefore in each sub-sector, may act according to this function in the subinterval willfully spot function value size relations, determines various conditions - performance function in this subinterval size sorting.

(3) Pick any spot in each sub-interval, calculates value of the function $f_{j1},f_{j2},\dots,f_{jn}$ separately, then carries on sorting to those n values, this sorting namely for function $f_{j1},f_{j2},\dots,f_{jn}$ on this subinterval size sorting.

To other environment condition factor, may use this algorithm to carry on the similar operations, thus obtains each preselected plan about this condition factor consistent fit and unfit quality sorting sector. May know by the consistent fit and unfit quality sorting sector's structure process, the sorting sector has nothing to do with the environment condition factor's concrete condition, only decided by the condition-performance function and the condition factor's change of state territory. Therefore we may use these consistent fit and unfit quality sorting sectors, under the specific environment condition (particularly under fuzzy environment condition), carry on measuring each preselected plan's fit and unfit quality.

III. CONSTRUCTING METHOD TO MEASURE MATCH DEGREE BETWEEN PRESELECTED PLAN AND ENVIRONMENT CONDITION

In the actual decision-making, the environment condition's vicissitude is an evolution process generally, therefore for a period of time condition value of environment condition factor generally in some bounded sectors to change. Therefore supposes the condition value of the environment condition factor u_j change in bounded sector D_j $(j = 1,2,\ldots,m)$ in this paper. Use consistent fit and unfit quality sorting sector algorithm which is constructed in second part of this paper, may obtain a series of consistent fit and unfit quality sorting sector to each preselected plan under various environment condition. When the environment condition has the fuzziness, the condition value of environment condition factor u_j is an indefinite sector value $[a_j, b_j]$ $(j = 1,2,\ldots,m)$. Below will construct a match measure operator, take the consistent fit and unfit quality sorting sector as "the rod", measures match degree between each preselected plan and the environment condition.

We take the environment condition factor u_j as an example, constructs this measure method. In second part of this paper, we already obtained the preselected plan $B_1, B_2, \ldots, B_n$ about the environment condition factor u_j, $t+1$ consistent fit and unfit quality sorting subinterval $D_{j1}, D_{j2}, \ldots, D_{jt+1}$. Because we have established the sector D_j is a bounded sector, therefore above the $t+1$ consistent fit and unfit quality sorting subintervals are bounded sectors. Supposed the indefinite environment condition value $[a_j, b_j]$ altogether to surmount $s[i, j]$ consistent fit and unfit quality sorting subintervals, and recorded separately as $D'_{j1}, D'_{j2}, \ldots, D'_{js}$. In each consistent fit and unfit quality sorting subinterval, the plan B_i corresponds a sorting number recorded as r_{ijk}, $k = 1,2,\ldots,s[i, j]$. Because the environment condition factor's condition value has the uncertainty, therefore may introduce a sorting number confidence level d_{ijk} to express that the credible degree of sorting number r_{ijk}, the confidence level formula is:

$$d_{ijk} = \frac{\|[a_j, b_j] \cap D'_{jk}\|}{\|[a_j, b_j]\|} \quad (\text{I})$$

There the symbolic $\|A\|$ expresses to ask the span of the sector A. Obviously $0 < d_{ijk} \le 1$, and the value d_{ijk} is bigger, the sorting number's credible degree r_{ijk} is higher.

Therefore, the match degree between the preselected plan B_i to environment condition factor u_j can be calculated using the following operator computation:

$$p_{ij} = \sum_{k=1}^{s} r_{ijk} d_{ijk} \quad (\text{II})$$

According to the similar method, may obtain match degree between each preselected plan to other environment condition factor. How to fuse those match degree one preselected plan to each environment condition factor, thus obtains the match degree between the preselected plan and the overall environment condition. This article has constructed following several methods:

A. Maximum value method

$$p_i = Max\{p_{i1}, p_{i2}, \ldots, p_{im}\}$$

Carrying on policy-making according to this method, the risk is big, but when the decision maker for the risk preference, the decision maker can achieve the greatest satisfaction to the results obtained by using this method.

B. Minimum value method

$$p_i = Min(p_{i1}, p_{i2}, \ldots, p_{im}\}$$

This decision method characteristic is just right opposite with the maximum value method. It is suitable to the risk circumvention policy-maker.

C. Arithmetic mean value method

$$p_i = \frac{p_{i1} + p_{i2} + \cdots + p_{im}}{m}$$

This method is suitable for the risk neutrality policy-maker.

When the policy-maker has the different value degree to various environment condition factor, may use the following weighted average method.

D. Median method

The median value of one series is refers to the value, firstly rising all the numbers in the series according to the foreword or the descending order, when the number integer is odd number, which located at the nearest-middle in ordered sequence, or the number integer is even number which is the mean of the nearest-middle two value.

(1) The median of the material not grouped

Firstly group various the match degree between the preselected plan B to environment condition factor u by ascending. Then, compute median:

When n is an odd number:

$$P(B_i) = P_{i,(n+1)/2}(B_i)$$

When n is an even number:

$$P(B_i) = \frac{P_{i,n/2}(B_i) + P_{i,(n+2)/2}(B_i)}{2}$$

(2) The median of the material grouped

If the material has grouped, and establishes distribution list, then calculate the median using the distribution list, its formula is:

$$P_i(B_i) = L_P + \frac{i_P}{f_P}(\frac{n}{2} - c_P)$$

In the formula:

L_P, L_P —lower limit;

i_P, i_P —interval;

f_P, f_P —number of times;

n —total degree;

c_p, c_p —number of times smaller than the median.

E. Simple weighted arithmetic average method

$$p_i = w_1 p_{i1} + w_2 p_{i2} + \ldots + w_m p_{im}$$

There $w_1, w_2, \ldots, w_m$ express that the policy-maker's value degree to various environment condition factor, has $0 \le w_1, w_2, \ldots, w_m \le 1$, and $w_1 + w_2 + \ldots + w_m = 1$.

F. Harmonic mean method

The harmonic mean is refers to the mean of observed values' reciprocal in the material. It may also divide into two kinds: simple harmonic mean and the weighted harmonic mean.

(1) Simple harmonic mean method

The simple harmonic mean is the distortion of the simple arithmetic mean value. It is the same with the simple arithmetic mean value in substance, but only has formal distinction between them, namely the calculation position and symmetrical position of the variable have difference. Therefore its formula is:

$$P_i(B_i) = \frac{1}{\frac{1}{m}\sum_{j=1}^{m}\frac{1}{P_{i,j}(B_i)}} = \frac{m}{\sum_{j=1}^{m}\frac{1}{P_{i,j}(B_i)}}$$

(2) Weighting harmonic mean method

The simple harmonic mean is the distortion of the simple arithmetic mean value. It is the same with the simple arithmetic mean value in substance, but only has formal distinction between them, namely the calculation position, weight value symmetry and symmetrical position of the variable have difference. Therefore its formula is:

$$P_i(B_i) = \frac{1}{\sum_{j=1}^{m}\frac{\lambda_j}{P_{i,j}(B_i)}}$$

Where $\lambda_1, \lambda_2, \ldots, \lambda_m$ satisfy the following conditions: $\sum_{j=1}^{m}\lambda_j = 1, 1 \ge \lambda_j \ge 0 \ (j = 1,2,\ldots,m)$

G. Combination of mean values [15]

The combination mean value defers that many kinds of traditional mean values carry on the weighted average. Therefore, its formula is:

$$p_0 = \sum_{i=1}^{n}\omega_i p_i$$

In the formula:

P_0 — combination mean value;

P_i —different type mean value, where $i = 1,2,\ldots,n$ (similarly hereinafter, omitted);

ω_i —weight of various mean values, they satisfy $\sum_{i=1}^{n}\omega_i = 1$. Combination mean value may collect each kind of mean value the superiority, reflects more accurately the information in the general level of data.

The combination mean value's precise degree may use the deviation average or standard deviation to estimate, available average deviation formula

$$D_i = \frac{\sum_{j=1}^{n}\left|x_j - p_i\right|}{n}$$

Standard deviation formula

$$S_i = \frac{\sum_{j=1}^{n}(x_j - p_i)^2}{n}$$

In the formula: n expresses the data centralized data integer; $x_j - p_j$ express the various several pair of i kind of mean value the deviation in the data concentrates; D_i express that the various several pair of i kind of mean value the even deviation the data concentrates; $\left(x_j - p_j\right)^2$ express that the various several pair of ith kind of mean value the variance the data concentrates; S_i express that the various several pair of ith kind of mean value the standard deviation the data concentrates.

H. Mathematics optimization method

Regarding each value $p_{i1}, p_{i2}, \cdots, p_{im}$, where each of them expresses information which obtains from the different attributes. When carry on the information fusion, a very natural idea is that: In the information fusion process, as far as possible to make the modification to the existing information to a minimum. We may establish the following mathematical programming model according to this principle:

$$\min\left(\sum_{j=1}^{m}\left(P_{i,j}(B_i) - P_i(B_i)\right)^2\right)$$
$$s.t. 0 \le P_i(B_i) \le n$$
$$(i = 1,2, \dots, n) \qquad (A2)$$

Through solving the optimize question $(A2)$, may obtain the following values: $P_i(B_i)$, $(i = 1,2, \dots, n)$.

I. Decision-makers risk-weighted method

When People carry on the decision-making at the definite condition, Risk preferences of decision makers is a very important decision parameter. Because policy-maker risk preference is different, with a plan, to a certain decision-makers policy makers it is an optimal plan, but to the other policy-makers it isn't necessarily optimal plan. Therefore in the indefinite multi-objective decision making, considers policy-maker's risk preferences is very essential. Before carrying on the decision-making, the policy-makers may carry on the evaluation to their risk-preference degree and construct the policy-maker risk-preference degree table shown as Figure 1.

TABLE I.
POLICY-MAKER RISK - INCOME BALANCE TABLE

Risk evaluation scale	Risk-preference degree
$R_2 = \{r_1^2, r_2^2\}$	$W = \{\lambda_1^2, \lambda_2^2\}$,where $\lambda_1^2 + \lambda_2^2 = 1$, $0 \le \lambda_1^2, \lambda_2^2 \le 1$
$R_3 = \{r_1^3, r_2^3, r_3^3\}$	$W = \{\lambda_1^3, \lambda_2^3, \lambda_3^3\}$,where $\lambda_1^3 + \lambda_2^3 + \lambda_3^3 = 1$ $0 \le \lambda_1^3, \lambda_2^3, \lambda_3^3 \le 1$
$\vdots$	$\vdots$
$R_p = \{r_1^p, \dots, r_p^p\}$	$W = \{\lambda_1^p, \dots, \lambda_p^p\}$,where $\lambda_1^p + \lambda_2^p + \dots + \lambda_p^p = 1$ $0 \le \lambda_1^p, \lambda_2^p, \dots, \lambda_p^p \le 1$

Note: On this table, in every risk evaluation scale, the risk degree along with the subscript increases. The value λ expresses risk-preference degree of policy-maker. The more the value of λ is big, the more policy-maker is like to the corresponding risk degree. $p = \max(s[i, j],$ $(i = 1,2, \dots, n)$)

Obviously, every evaluation value of the plan B_i ($i = 1,2,\cdots,n$) under Corresponding environment condition factor $u_1, u_2, \cdots, u_m$ is a non-definite value. So the value v_{ij} $(j = 1,2,\cdots.m)$ may surmount s_{ij} consistent fit and unfit quality sorting subintervals, and recorded separately as $D'_{j1}, D'_{j2}, \dots, D'_{js}$, corresponding have $s[i, j]$ sorting numbers recorded as r_{ijk}, $k = 1,2, \dots, s_{ij}$. The sorting number of the plan B_i is indefinite. This means that when carrying on the decision-making, the policy-maker must undertake the corresponding risk. Therefore, need to consider the risk preference of decision makers.

Definition 1. Call $\sum_{k=1}^{s[i,j]} \lambda_k^{s[i,j]} P_{ijk}[B_i]$ as risk-weighted match degree between the plan B_i and Policy-making environment under the environment condition factor u_j .recorded as " P_{ij} " $(i = 1,2, \dots, n)$, $(j = 1,2, \dots, m)$.

Definition 2. Call $\sum_{j=1}^{m} \omega_j P_{ij}(B_i)$ as risk-weighted match degree between the plan B_i and Policy-making environment, recorded as " P_i " $(i = 1,2, \dots, n)$.

Risk-weighted match degree operator

RWMDO: $\tilde{\mathrm{V}}^m \to R$, $\tilde{\mathrm{V}}^m$ is the set which constituted by m-dimension vectors.

$$\mathrm{P}_i = RWMDO_{W,B}(\tilde{v}_{i1}, \tilde{v}_{i2}, \dots, \tilde{v}_{im})$$
$$= \sum_{j=1}^{m} \omega_j P_{ij}(B_i)$$
$$= \sum_{j=1}^{m} \omega_j \sum_{k=1}^{s[i,j]} \lambda_k^{s[i,j]} P_{ijk}(B_i)$$
$$(i = 1,2, \dots, n)$$

Where $W = (\lambda_1^{s[i,j]}, \lambda_2^{s[i,j]}, \dots, \lambda_{s[i,j]}^{s[i,j]})$ is $P_{ijk}(B_i), P_{ijk}(B_i) \dots, P_{ijk}(B_i)$ policy-maker risk-preference weight vector. $B = (\omega_1, \omega_2, \dots, \omega_m)$ is the expert weight vector of environment condition factor $u_1, u_2, \dots, u_m$. ω_j is the weight value of environment condition factor u_j $(j = 1,2, \dots, m)$. $\tilde{v}_{ij}$ represent a sector value. Measure plan B_i ($i = 1,2, \dots, n$) under the environment condition factor u_j $(j = 1,2, \ldots, m)$ and get a sector value, recorded as $\tilde{v}_{ij}$.

Decision Algorithm

Input: (1) Each preselected plan's evaluation information under various environment condition factors.

(2) Each preselected plan's condition-performance functions to each environment condition factor.

Output: The plan owing the biggest match degree with the environment

BEGIN

The step one: Obtains the match degree between the preselected plan B_i to environment condition factor u_j $(i = 1,2, \ldots, n)$, $(j = 1,2, \ldots, m)$ by Algorithm for gaining Consistent fit and unfit quality sorting sector constructed in the second part of this paper.

Take the environment condition factor u_j as the example:

Making up all two-combination from n condition-performance functions will obtain C_n^2 equation sets. Solving each of these equation sets, if one equation set has the infinite multi-solutions, then does not consider this equation set's solution. Only need to consider that has the only solution equation sets, and constitute x coordinate figure of these equation set solution as a set $E = \{e_{1j}, e_{2j}, \ldots, e_{tj}\}$.

(2) Divide the sector D_j with the spots in the set E, then obtains $t+1$ sub-sectors $D_{j1}, D_{j2}, \ldots, D_{jt+1}$.

May known by the proposition 2 that the n state-performance functions $f_{j1}, f_{j2}, \ldots, f_{jn}$ has the uniformity size sorting in such sub-intervals. Therefore in each sub-sector, may act according to this function in the subinterval willfully spot function value size relations, determines various conditions - performance function in this subinterval size sorting.

(3) Pick any spot in each sub-interval, calculates value of the function $f_{j1}, f_{j2}, \ldots, f_{jn}$ separately, then carries on sorting to those n values, this sorting namely for function $f_{j1}, f_{j2}, \ldots, f_{jn}$ on this subinterval size sorting.

The step two: the preselected plan $B_1, B_2, \ldots, B_n$ about the environment condition factor u_j , $t+1$ consistent fit and unfit quality sorting subinterval $D_{j1}, D_{j2}, \ldots, D_{jt+1}$. Supposed the indefinite environment condition value $[a_j, b_j]$ altogether to surmount s consistent fit and unfit quality sorting subintervals, and recorded separately as $D'_{j1}, D'_{j2}, \ldots, D'_{js}$. In each consistent fit and unfit quality sorting subinterval, the plan B_i corresponds a sorting number recorded as r_{ijk} , $k = 1,2, \ldots, s$. Because the environment condition factor's condition value has the uncertainty, therefore may introduce a sorting number confidence level d_{ijk} to express that the credible degree of sorting number r_{ijk} , the confidence level formula is:

$$d_{ijk} = \frac{\left\| [a_j, b_j] \cap D'_{jk} \right\|}{\left\| [a_j, b_j] \right\|}$$

There the symbolic $\|A\|$ expresses to ask the span of the sector A. Obviously $0 < d_{ijk} \le 1$, and the value d_{ijk} is bigger, the sorting number's credible degree r_{ijk} is higher.

Therefore, the match degree betwween the preselected plan B_i to environment condition factor u_j can be calculated using the following operator computation:

$$p_{ij} = \sum_{k=1}^{s} r_{ijk} d_{ijk}$$

The step three: Fuse those match degree one preselected plan to each environment condition factor, thus obtains the match degree between the preselected plan and the overall environment condition by the method constructed in the third part of this paper.

The step four: Sort the match degree between the preselected plan and the overall environment condition according to descending order. The first plan is the optimal plan.

END

IV. EXAMPLE ANALYSIS

Suppose that one venture capital company carries on the investment, there are three to be selected enterprises A_1, A_2, A_3. By the macro-economic environment (u_1), the labor force supply and demand condition (u_2) as well as the profession development prospection (u_3), carry on evaluation to three enterprises' condition. Uses 0 to 10 points, carries on the allocation to various environment condition factor (score to be higher, corresponding environment condition is better), because the future environment condition will be impossible to know in advance completely, therefore various environment condition factor's condition evaluation value will be gives by the sector number form, as the table (1) will show:

TABLE II.
FUTURE ENVIRONMENT CONDITION FORECAST TABLE

	u_1	u_2	u_3
Condition evaluation value	（7，9.5）	（7，8.5）	（6，8.5）

Each preselected enterprise's condition-performance function to various environment condition factors, as the table (2) shows:

TABLE III.
ENTERPRISE'S CONDITION-PERFORMANCE FUNCTION TO EACH ENVIRONMENT CONDITION FACTOR

	u_1	u_2	u_3
A_1	f(x)=0.5x-0.5	f(x)=2.5x-11	f(x)=2x-11
A_2	f(x)=x-3	f(x)=3x-15	f(x)=0.5x+1
A_3	f(x)=1.5x-7.5	f(x)=2x-8	f(x)=x-2

According to consistent fit and unfit quality sorting sector algorithm which is constructed in the second part in this paper, may obtain the following result (In following table, digital 1,2,3 express condition-performance function in corresponding condition sector size sorting number, sorting number is smaller, express that enterprise's performance is better in this condition sector).

TABLE IV.
CONSISTENT FIT AND UNFIT QUALITY SORTING SECTOR TABLE

Macro economic environment	enterprise	(0,5)	(5,7)	(7,9)	(9,10)
	A_1	1	2	3	1
	A_2	2	1	1	3
	A_3	3	3	2	2
Labor force supply and demand condition	enterprise	(0,6)	(6,7)	(7,8)	(8,10)
	A_1	2	1	1	2
	A_2	3	3	2	1
	A_3	1	2	3	3
Profession development prospection	enterprise	(0,6)	(6,8)	(8,9)	(9,10)
	A_1	3	3	2	1
	A_2	1	2	3	3
	A_3	2	1	1	2

Carring on computation ccording to formula (Ⅰ) and (Ⅱ) will get the following resulting:

TABLE V.
MATCH DEGREE BETWEEN EACH ENTERPRISE AND VARIOUS ENVIRONMENT CONDITION FACTOR

	u_1	u_2	u_3
A_1	2.6	1.3333	1.8
A_2	1.4	1.6667	3
A_3	2	3	1.2

Suppose that policy-maker's the value degree to u_1, u_2 and u_3 is: $w_1 = 0.3$, $w_2 = 0.5$, $w_3 = 0.2$. By the weighted average formula computation, we can get: r_1 =1.8067, r_2 =1.8534, r_3 =2.34. Therefore, under this kind of environment condition, the enterprise 2 is the best invested enterprise.

Ⅴ. CONCLUSIONS

This article has conducted the research to the selection optimum matching plan's policy-making question under the specific external environment condition. First has constructed a consistent fit and unfit quality sorting sector algorithm, then take the consistent sorting sector as the foundation, constructed the match measure operator to measure match degree between the preselected plan and the environment condition. The plan with the biggest match degree is the synergy. Then we may further conduct the research in the condition that the condition-performance function is nonlinear function.

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