Research Article
Research on Measurement, Evaluation and Application of Brand Added-value for Air Conditioning Enterprise

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Abstract: In order to improve the brand added value of the enterprise, this paper studies the Brand added value by using directly assessment method. We consider brand excess receipts, customer loyalty, loyalty conversion synthetically and give the measure evaluation model of brand added value. According with the actual operation data of Chinese air conditioning enterprise, the relevant practical brand added value is calculated by using the direct evaluation method. The result of this study can effectively improve the brand added value of the enterprise, shape corporate image.

Keywords: Brand added value, directly assessment, fuzzy evaluation

INTRODUCTION

The product is used to meet consumer demand. In the conditions of product homogeneity, the consumer is in trouble for choice. The brand is an important standard for consumers' choose and identification. Because the brand gives the product connotation which is beyond material, we called it the brand added value. The domestic and international famous brands all depend on the added value to improve the value.

Nowadays, globalization and marketization trend has become increasingly obvious (Daliang and Yiqun, 2000; He, 2001). Many China's manufacturing is struggling to lock the independent brand road, the independent brand is able to be of formation and development and vitality and all these should be attributed to create innovation. The increase of brand added value is due to independent innovation naturally, as long as we persist in innovation, we will inevitably bring new surplus value and market share in addition to technical management and the high brand added value management (Liang and Minlun, 2000). For this, the brand added value includes feelings, culture, credit, spirit, grade which are beyond basic function. At the same time it also has connotation of beauty, culture and grade, can also give an idea of the solid brand.

Because the importance of the brand added value for enterprises development, image and market share, many experts and scholars at home and abroad have had the further study. The brand of enterprise assets evaluation and brand shaping are studied in view of the situation in China by Wang and Li (2003) and achieved fruitful results. Liu and Zhao (2002) measured the enterprise brand value through the application of EVA model and compared with the traditional MVA and FGV methods, then studied management direction of the value creation. The research results have a certain value for the enterprise brand value construction. Bai and Lu (2007) researched the method and process of creating enterprise product added value from the angle of design and management and has achieved good results and innovation.

Based on the research at home and abroad, this paper studies brand excess receipts, customer loyalty and loyalty conversion synthetically by using directly assessment method. According with the actual date of 6 enterprises in air condition industry, we get the rank and brand added value of every enterprise and give the analysis in the economic management sense. The process and conclusion of this study have the certain theoretical innovation and practical significance for exploring their own enterprise and market brand added value, shaping the enterprise brand, promoting the enterprise image and the market share.

MODEL

Hypothesis: Due to the intangible asset which is formed by the past management behavior of the enterprise, it can bring the value income for the enterprise and forms the consumer loyalty value. Because the influence of some factors for the brand added value is common or unpredictable, so we should have hypothesis before build brand value calculation model. The enterprise has a common time base and

macro environment and does not consider the influence of force majeure; the enterprise is the sustainable development in a period of time.

The model of directly assessment: According to the contribution of brand power value and consumer value for brand added value, the model is built by using the weighted sum:

$$V = \alpha_1 V_1 + \alpha_2 V_2$$

where,

V = The brand added value

V_1 = The brand power value

V_2 = The brand customer value

α_1 = The weight of the brand power value against the brand added value

α_2 = The weight of the brand customer value against the brand added value

Quantitative and determination of brand excess receipts: Brand excess receipts are confirmed by:

$$R = (P_2 - P_1)Q(1 - T)$$

where,

R = The brand excess receipt
P_2 = The price of brand product
P_1 = The average price of similar no brand product
Q = The sales volume of the brand value
T = The tax rate

The influenced index of the profit potential for the brand value is 0.23 in the appliance industry. The total of profit potential index is 25 in the appliance industry. There are 5 factors which influence the profit potential index and assign for every factor. The ideal score of every factor is as follow.

Then we can get the coefficient of profit potential. We can confirm the brand power value by:

$$V_1 = R * q$$

where,

V_1 = The brand power value
R = The brand excess earnings
q = The of profit potential coefficient

The calculation method of consumer loyalty: Let the evaluation factors which are from fuzzy comprehensive evaluation set as weights, we can get the expectation of the predicted target and it is the consumer loyalty:

$$E = \sum u(v_i)h(v_i)$$

where, E is the expectation value. The fuzzy factor is a fuzzy set $[u(v_1), u(v_2), \cdots, u(v_n)]$ and its domain of

discourse is the evaluation set $(v_1, v_2, \ldots, v_n)$. This fuzzy set satisfies $\sum u(v_i) = 1$. $u(v_i)$ is the membership of vi. The influence vector of the evaluation set is a n-dimention real linear vector $[h(v_1), h(v_2), \cdots, h(v_n)]^T$. h is the mapping from the evaluation set $\{v_1, v_2, \cdots, v_n\}$ to the space [X, Y]. Usually, the closed interval is [0, 1].

The steps of calculation are as follow:

- Set up the set of factors. According with the hierarchy analysis which influences the value of consumer loyalty, we can get the set of factors $U = \{u_1, u_2, \cdots, u_n\}$

- Set up the set of weights. According with the score of experts, we can confirm the weight of every factor which influences the value of consumer loyalty, then we set up the corresponding evaluation set.
  V = {v₁, v₂, …vₘ} = better, good, ordinary, bad, worse}

- Set up the single factor evaluation set f: U →Γ(V). Fuzzy mapping f can lead fuzzy relationship $Rf \in \Gamma(U * V)$ and R_f can be expressed by fuzzy matrix:

$$R = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ r_{m1} & r_{m2} & \cdots & r_{mn} \end{bmatrix}$$

- Fuzzy comprehensive evaluation.

$$B = A \circ R = (b_1, b_2, \cdots, b_6) \text{ and } \sum b_i = 1$$

- Confirm the influenced variable of evaluation. The closed interval is [0, 1].

Let

$$h(v_i) = 1(i-1)(1-0)/(n-1), i = 1, 2, \cdots, 6, n = 6$$

The influenced vector of the evaluation set is:

$$\left(1, \frac{4}{5}, \frac{3}{5}, \frac{2}{5}, \frac{1}{5}, 0\right)^T$$

At last, the consumer loyalty is:

$$E = \sum_{i=1}^{n} b_i h(v_i)$$

Loyalty conversion: In this study, the market share is:

$$C = \sum_{i=1}^{p} a_i C_i$$

where,

C = The market share
α_i = The sales proportion of product i
p = The number of product kinds

We can estimate the regression model of the loyalty conversion and the market share:

$$y = 0.45C - 3.96$$

where,
y = Loyalty conversion
C = The market share

Calculation of brand added value: According with the meaning of every factor and the weight for brand customer, we build the evaluation formula:

$$V_2 = M \times E \times [1 + (1 - E) \times y] \times t$$

where,
V_2 = The brand customer is value
M = Brand income
E = Consumer loyalty
y = Loyalty conversion
t = The limit of time

POSITIVE ANALYSIS

Brand added value is a comprehensive intangible asset. This study does a positive analysis for 6 big air condition enterprises; the result is shown as follow.

For air condition enterprises, $\alpha_1 = 0.58$, $\alpha_2 = 0.42$ is from related reference.

Calculate brand excess profit for every air condition enterprise. The result is shown as follow.

Thus, potential coefficient which is shown as follow can be got.

And the corresponding bar Chart of potential coefficient is as follow.

As shown in Fig. 1, the top three firms of potential coefficient is Haier, Midea and Gree, but the differences between them is not big enough. In the process of calculating the loyalty conversion of every brand, we use the score of experts:

$$A = (a_1, a_2, \cdots, a_m) = (0.51, 0.13, 0.26, 0.06, 0.04); m = 5$$

The loyalty conversion of every brand is shown as follow.

Synthesize Table 1 to 4, we can get the brand added value of every enterprise.

We can see in the Table 5, the rank of the brand added value for air condition enterprise is: Gree, Midea, Haier, Kelon, Meling, Chunlan. The corresponding bar chart of the brand added value is as Fig. 2.
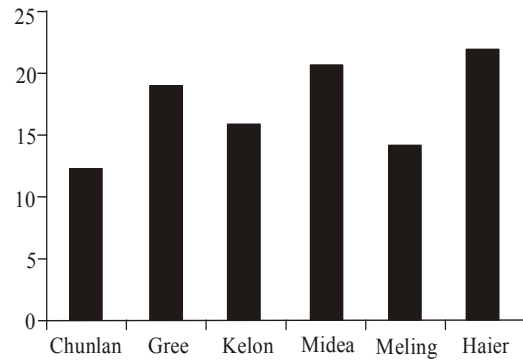

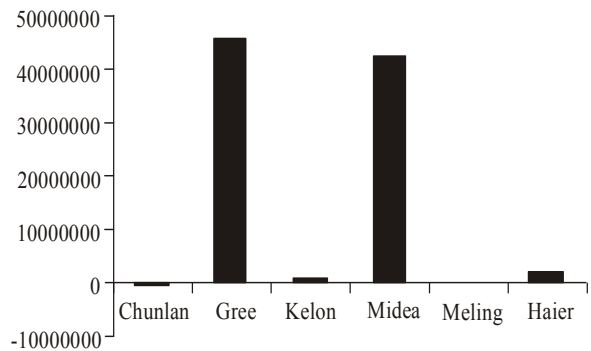Fig. 1: The bar chart of potential coefficient

Fig. 2: The bar chart of the brand added value
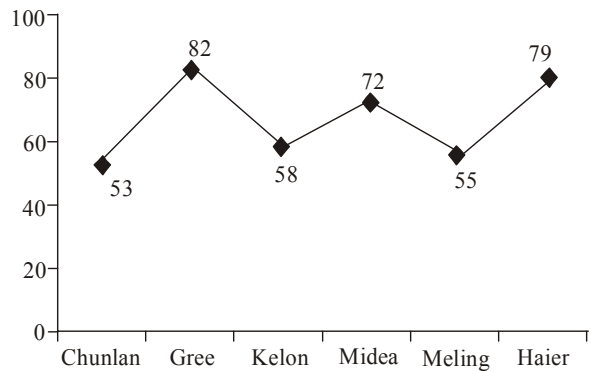
Fig. 3: The brand strength for every enterprise

We can see in the bar chart, the brand added values of Gree and Midea get a good lead in this industry.

This shows that the two companies is distinguished in the process of increasing the brand added value, increasing brand creative ability of science and technology, improving consumer loyalty and market share aspects contribute. The development model and brand shaping model has good development effect, it is worth for further research by the related enterprise. We choose the different date to calculate the brand profit (Table 6).

Table 1: The ideal score of every factor

Name	Development state	Innovation	Internationalization	Brand history	Brand protection
Score	10	50	30	5	5

Table 2: Date of air condition enterprises

	Sales revenue	Selling profit	Profit rate (%)	Market share (%)
Chunlan	76756.16	14161.51	18.45	0.25
Gree	7478482.85	1382771.48	18.49	24.65
Kelong	651677.46	105376.25	16.17	2.15
Midea	6379098.74	1310266.88	20.54	21.02
Meiling	224826.82	28980.18	12.89	0.74
Haier	1210135.64	261994.37	21.65	3.99
Total	16020977.67	3103550.66	.--	52.80

Table 3: Brand excess profit for every air condition enterprise

	2009	2010	2011	Brand excess profit
Chunlan	-14231.38	17387.43	-14719.36	-3935.77
Gree	14524.45	1678055.42	1967486.62	1545515.86
Kelon	-52336.50	347854.69	53725.33	134091.48
Midea	128821.50	1622006.65	1553170.59	1338724.43
Meling	15605.24	24261.03	61890.79	41633.28
Haier	-96278.56	271050.33	70562.17	109584.77

Table 4: Potential coefficient of every enterprise

Factor	Development state	Innovation	Internationalization	Brand history	Brand protection	Total	Potential cofficient
Full mark	10	50	30	5	5	100	25.00
Chunlan	5	25	12	4	3	49	12.25
Gree	8.5	35	25	4	4	76.5	19.13
Kelon	6	32	20	3	3	64	16.00
Midea	9	40	25	4	4	82	20.50
Meling	6	30	15	3	3	57	14.25
Haier	9.5	45	25	4	4	87.5	21.88

Table 5: The brand added value of every enterprise

	Right value	Consumer value	Added value	Rank
Chunlan	-48213.14	-194843.117	-118595.5298	6
Gree	29557990.79	62691312.59	45461985.25	1
Kelon	2145463.65	-1037584.144	617600.7106	4
Midea	27443850.78	58337054.78	42272588.7	2
Meling	593274.23	-530401.1567	53910.04335	5
Haier	2397166.83	1598483.624	2013798.891	3

Table 6: Brand profit for every enterprise

	2009	2010	2011	Brand profit
Chunlan	74088.09	91475.52	76756.16	81217.94
Gree	3832940.81	5510996.23	7478482.85	5748051.68
Kelon	250097.44	597952.13	651677.46	547520.54
Midea	3203921.50	4825928.15	6379098.74	4928339.14
Meling	138675.00	162936.03	224826.82	196059.07
Haier	868523.14	1139573.47	1210135.64	1367240.55

Table 7: The brand strength of Chunlan

Factors	Full score	Actual score
Brand relationship	25	12
Market feature	10	6
Regional influence	25	13
Brand tendency	10	4
Brand support	10	4
Brand stability	15	11
Brand protection	5	3
Total score	100	53

Table 8: The brand strength of Gree

Factors	Full score	Actual score
Brand relationship	25	22
Market feature	10	8
Regional influence	25	22
Brand tendency	10	7
Brand support	10	7
Brand stability	15	13
Brand protection	5	3
Total score	100	82

According with expert scoring method, we can get the brand strength for every enterprise. Experts evaluate operating situation and financial factors, then get a score for every enterprise. The score of every enterprise is as follow:

The first line of Table 7 is 7 measure factors, the second line is the full score for every factor and the last line is the actual score which is form experts for every factor. We can see that the brand strength of Chunlan is 53 (Table 8).

Table 9: The brand strength of Kelon

Factors	Full score	Actual score
Brand relationship	25	15
Market feature	10	6
Regional influence	25	13
Brand tendency	10	6
Brand support	10	5
Brand stability	15	10
Brand protection	5	3
Total score	100	58

Table10: The brand strength of Midea

Factors	Full score	Actual score
Brand relationship	25	19
Market feature	10	6
Regional influence	25	20
Brand tendency	10	6
Brand support	10	5
Brand stability	15	12
Brand protection	5	3
Total score	100	72

Table 11: The brand strength of Meling

Factors	Full score	Actual score
Brand relationship	25	15
Market feature	10	5
Regional influence	25	14
Brand tendency	10	4
Brand support	10	6
Brand stability	15	9
Brand protection	5	2
Total score	100	55

Table 12: The brand strength of Haier

Factors	Full score	Actual score
Brand relationship	25	20
Market feature	10	8
Regional influence	25	20
Brand tendency	10	7
Brand support	10	8
Brand stability	|5	13
Brand protection	5	3
Total score	100	79

Table 13: The brand added value for every enterprise

	Brand profit	Brand Strength	Brandadded value	Rank
Chunlan	81217.94	53	4304550.56	6
Gree	5748051.68	82	471340237.97	1
Kelon	547520.54	58	31756191.42	4
Midea	4928339.14	72	354840418.29	2
Meling	196059.07	55	10783248.94	5
Haier	1367240.55	79	108012003.62	3

Table 14: The comparison between different methods

	Direct evaluation	Interbrand method
	Rank	Rank
Chunlan	6	6
Gree	1	1
Kelon	4	4
Midea	2	2
Meling	5	5
Haier	3	3

The brand strength of Midea is 82, this situation is obviously better than Chunlan's (Table 9).

We know that the brand strength of Kelon is 58, it is in an bad state (Table 10).

The brand strength of Midea is 72 (Table 11).

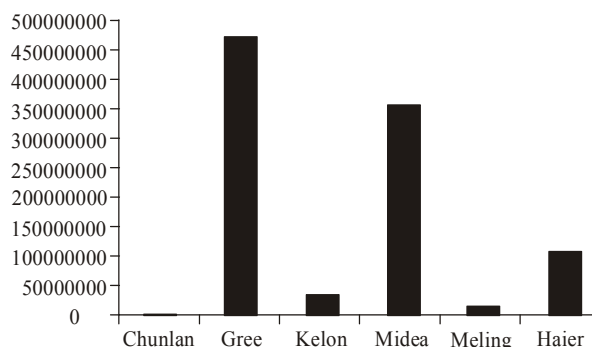The brand strength of Meling is 55 (Table 12).

Fig. 4: The bar chart of the brand added value

In general, Gree has the highest brand strength which is 82. This result can't be separate from market reputation and after-sale service. In this order, Haier gets 79, Midea gets 72, Kelon gets 58 and Meling gets 55. Chunlan is in the last, so it should be improved (Fig. 3).

According with the formula of inter brand method, we can get the brand added value for every enterprise, then get a rank for enterprises (Table 13).

We can see that the rank of brand added value is: Haier, Gree, Chunlan, Midea, Meling and Kelon. The bar chart of the brand added value for every enterprise is as follow (Fig. 4).

We have got two results by using direct evaluation method and inter brand method, we'll compare those two results (Table 14).

We can see that evaluation results which are got by using different methods for 6 air condition enterprises are completely identical. So we can get that both those two methods are acceptable and workable.

CONCLUSION

High brand added value is an important factor for promoting brand, the research on brand added value is necessary absolutely. This study introduces the importance of the brand added value for the enterprise, decision factors and research progress at home and abroad firstly and then calculate the brand added value through the establishment of weight model and finally get the brand added value operation formula according to quantitative model. According with the actual date of 6 enterprises in air condition industry, we get the rank and brand added value of every enterprise and give the analysis in the economic management sense. The process and conclusion of this study have the certain theoretical innovation and practical significance for exploring their own enterprise and market brand added value, shaping the enterprise brand, promoting the enterprise image and the market share.

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