The Establishment of Sales Growth Model
Based on the Theory of Marketing Force

Ying Liu
School of Economics and Management, Shenyang Ligong University, Shenyang 110168, China
Tel: 86-24-2469-3286   E-mail: ly581211@126.com

Abstract
This text analyses “marketing force” which is the key element deciding the sales quantity and converts the operation of resource combination to marketing force operation, which makes marketing force to resource operation. How to make the best resource combination and how to realize sales growth in marketing circular is the main subject of this text.

Keywords: Marketing force, Sales growth, Model, Marketing circular system

1. Marketing force and its components

1.1 Marketing static circular system
Marketing is not a simple linear problem but a circular system. An enterprise usually performs repetitive production till one product is kicked out by the market or disappears strategically according to the market conditions. It is a circular movement. Now we simulate a complete process in which a middleman participates, building a marketing static circular system as follow.

1.2 Components of marketing force
The marketing force means the sum of all forces that realize the operation of product marketing circular system.

(1) Product force
It is necessary for a product possessing this force. Similar to the engine in a motor, without the engine, the motor will not move or run. The product force is shown in the figure as follow.

Product force, F0 in Figure 2, is the match degree of products and demands. The elements that influence the product force include: the product’s use value, quality, style, package, maintenance, installation, brand, logistics, and guaranty, the intensity of consumers’ demand, and the match degree of the two.

(2) Marketing pushing force
How to make product arrive consumers at the right time by sale channels? We must impose certain external force, namely the pushing force, on the product. It includes: personal sales promotion, channel sales promotion, and ads sales promotion. This force is displayed in Figure 3 as follow.

The power of this force is valued by the profits (or other market indexes) and a product’s circular speed. The influencing elements include: product nature (production materials or consumable goods), product attribute (cost price, quality, standardization, added service, and life cycle), pricing strategy, channel character (channel’s type, width and depth, and middlemen’s competence), enterprise quality (personnel competence, economic strength, talent strength, size, marketing level, and service capability), economic environment, and political environment.

(3) Marketing pulling force
A psychological distance exists in product demands. We impose another external force, namely the pulling force. Its effect is to help consumers overcome the psychological barrier in buying products. It is: consumer sales promotion, seller sales promotion, and media ads. In Figure 4, the pulling force is F2.

The influencing elements include: target market element (distribution and size of consumers, consumers’ purchase feature, degree of competition, and local economic development), enterprise condition, product feature, economic environment, and political environment.
(4) Repetitive purchase force

Repetitive purchase needs force either. The decisive factor for a consumer purchasing the same product again is the stable quality and the satisfying service. The two factors are from the exterior. It is a kind of “repetitive force”. Here, we name the stable quality as the repetitive force F31, and satisfying service as the repetitive force F32 in Figure 5 as follow.

The repetitive force includes five marketing dimensions: understanding, well-known, well reputation, frequent mention, and satisfaction. The influencing elements include: product quality, service level, brands, image, and consumption characteristics.

2. Marketing force ------ sales growth model

Firstly, we introduce a physical model as follow in Figure 6.

A body M moves following the path L. If do not take the quality into consideration, there are only two main factors determining the body’s speed. The first is the $\sum F$ and the second is the length of L (suppose it is S). Suppose the circular frequency is Q. Then, $Q=\frac{\sum F}{S}$.

Next introduce this model into the “marketing static circular system” as follow in Figure 7.

In the “marketing static circular system”, the product’s circular speed determines the growth of sales. Q stands for the sales growth, which is related with the forces and the perimeter S. The relationship is similar to the physical model above, namely:

$Q=\frac{\sum F}{S}$

Forces exert different effects in different enterprises, for different products, at different time, and under different market conditions. Therefore, suppose the weight of each force is $K_n$, then:

$\sum F=K_0F_0+K_1F_1+K_2F_2+K_3F_3$  …………………………………….   Formula 3.1

S stands for the path of the circular system. It represents the middlemen between products and demands. It is the distance for starting a new cycle by the repetitive force of quality and service.

$S=S_0+S_1$

$S_0$ ---- psychological distance, $S_1$ ---- spatial distance and time distance.

To sum up, get the conclusion:

$Q=K\times\varepsilon\times\left[\frac{\sum F_1}{S_1}+\frac{\sum F_2}{S_2}+\ldots+\frac{\sum F_n}{S_n}\right]$  …………………………………….  Formula 3.2

Here, k is the resource coefficient. $\varepsilon$ is the channel barrio coefficient. It reflects the impact of channel conflicts on sales growth. Suppose $0<\varepsilon\leq1$.

As no channel conflicts, $\varepsilon=1$;

As channel conflicts exist, $0\leq\varepsilon<1$.

3. Quantitative analysis of marketing force and sales growth

Take two products, A and B, in one brand in an enterprise for example. Before listing in market, analyze their sales growth trend and compare the possibility of their successes. Make quantitative analysis of elements in marketing static circular system.

Here suppose the standard for the quantitative analysis of marketing force is:

Unit of force: degree

Evaluate the degree of force: based on market research, adopt a reasonable method and transform the result into data. For example, as for the degree of satisfaction, suppose there are ten degrees from zero to tenth.

Extremely satisfied ------ 9 degree      Better satisfied ------ 8 degree

Well satisfied ------ 7 degree      Satisfied ------ 6 degree

 Unsatisfied ------ 5 degree      More unsatisfied ------ 4 degree

Extremely unsatisfied ------ 3 degree

3.1 Analyze the product force of A and B

Suppose the product force of A is $F_0A$, and the product force of B is $F_0B$.

Firstly, test the match degree of A and B’s core products with customers’ demand for same target consumers. Use M to represent this index and $0\leq M\leq10$. The unit is degree.

Namely: core products  …………………………………….  use demands
By means of market research techniques and statistical methods, evaluate the use value of product A and B for target consumers. The result:

MA=7 degree
MB=9 degree

Secondly, test the match degree of A and B’s form products and related products with target consumers’ psychological needs and potential needs. Use the acceptance degree of consumers to represent this index, 0≤R≤10. The unit is degree. Namely:

Form products + related products → psychological needs + potential needs

The result: RA=8 degree
RB=8 degree

Thirdly, according to the definition of product force F0:

F0=M0+R0 …………………………………………………… Formula 3.4

This formula represents the relationship between products and demands.

Then, F0A=M0A+R0A=7+8=15 degree
F0B=M0B+R0B=9+8=17 degree

Fourthly, considering the impact of competition on product force, suppose the competition entrance coefficient is g0, which means products’ differentiation degree and scientific & technological contains in market competition. This coefficient reflects a product’s core competence. Suppose 1≤g0≤2.

As a product is similar to another product in competition (low differentiation) and has lower scientific & technological contains, g0 ----→ 1;
As a product is far different from another product in competition (high differentiation) and has higher scientific & technological contains, g0 ----→ 2.

Introduce g0 into Formula 3.4 and get:

F0= g0 (M0+R0) ………………………………………………… Formula 3.5

Namely, there is a correlation between product force F0 and competition entrance coefficient. The higher the product differentiation and scientific & technological contains, the higher the value of g0. And the F0 rises correspondingly.

Make an advantage and disadvantage analysis of product A and B with the same product in competition and get the result (no more discussion in this text).

Suppose: gA=1.3, gB=1.5
Then, F0A=gA(MA+R0A)=1.3×15=19.5 degree
F0B=gB(M0B+R0B)=1.5×17=25.5 degree

3.2 Analyze the static pushing force of product A and B

Suppose: Product A’s static pushing force is F1A
Product B’s static pushing force is F1B.

Without considering the competition element, analyze the middlemen by means of market research techniques and statistical methods (as follow in Figure 10).

What the middlemen consider is whether it is profitable and the product’s circular speed. Without considering the support for promotion, the key for this element is the product’s quality and price. By research and analysis we can get this conclusion.

Use M1 to represent the satisfaction to profits. Use R1 to represent the future evaluation on circular speed. Suppose:

M1A=6 degree, M1B=5 degree
R1A=9 degree, R1B=7 degree

Then,
F1A=M1A+R1A=6+9=15 degree
F1B=M1B+R1B=5+7=12 degree

Considering the effect of competition on channels, suppose the channel disturbing coefficient is g1, which reflects the competition in fields of marketing channels. Suppose 0≤g1≤1.
As the channels compete severely, \( g_1 \) ------ 0;  
As there is no competition among channels, \( g_1 \) ------ 1;  
The competition can be set by people, such as whether ads are necessary or not and the time and amount, and the percentage of channel promotion to price.  
Then, \( F_1 = g_1(M_1+R_1) \)  
Formula 3.6  
So, there is a direct relationship between the static pushing force \( F_1 \) and the channels promotion. The severer the competition is, the stronger the disturbance is. \( g_1 \) is close to 0 and \( F_1 \) is weaker. Whereas, the competition is weaker and even there is no competition, \( g_1 \) is close to 1.  
Suppose: \( g_1 = 0.8 \)  
Then, \( F_{1A} = g_1(M_{1A}+R_{1A}) = 0.8 \times 15 = 12 \) degree  
\( F_{1B} = g_1(M_{1B}+R_{1B}) = 0.8 \times 12 = 9.6 \) degree  

3.3 Analyze the static pulling force of product A and B  
Suppose product A’s static pulling force is \( F_{2A} \) and product B’s static pulling force is \( F_{2B} \).  
As products meet target consumers, whether customers buy the products finally? The answer is uncertain. As for this question, we get a conclusion by an experiment of researching the static pulling force based on research techniques and statistical methods (as follow).  
In Figure 11, there are four psychological barriers in front of products and demands, namely customers’ recognition (\( X_1 \)), understanding (\( X_2 \)), preference (\( X_3 \)), and price acceptance (\( X_4 \)) to products.  
Namely, \( F_2 = X_1 + X_2 + X_3 + X_4 \)  
Suppose the values of \( X_1, X_2, X_3, \) and \( X_4 \) are between 0 and 10. Get the result by researches and statistical methods (as follow).  
\( F_{2A} = X_{1A} + X_{2A} + X_{3A} + X_{4A} = 28 \) degree  
\( F_{2B} = X_{1B} + X_{2B} + X_{3B} + X_{4B} = 32 \) degree  
Considering the effect of competition on the terminal pulling force, suppose the sales terminal competition disturbing coefficient is \( g_2 \), which reflects the competition of sales terminal. Suppose \( 0 \leq g_2 \leq 1 \).  
As the competition in sales terminal is very hot, \( g_2 \) ------ 0;  
As there is no competition in sales terminal, \( g_2 \) ------ 1;  
Get data of competition by researches and analyses. Suppose it is between 0 and 1. Indexes for testing the competition in sales terminal include store display, terminal promotion, and media ads investments.  
Introduce sales terminal’s competition disturbing coefficient \( g_2 \) into the formula:  
\( F_2 = g_2(X_1 + X_2 + X_3 + X_4) \)  
Formula 3.7  
Suppose \( g_2 = 0.4 \) (competition is severer), get:  
\( F_{2A} = g_2(X_{1A} + X_{2A} + X_{3A} + X_{4A}) = 0.4 \times 28 = 11.2 \) degree  
\( F_{2B} = g_2(X_{1B} + X_{2B} + X_{3B} + X_{4B}) = 0.4 \times 32 = 12.8 \) degree  

3.4 Analyze the static repetitive force \( F_3 \) of product A and B  
Suppose product A’s static repetitive force is \( F_{3A} \) and product B’s static repetitive force is \( F_{3B} \).  
The elements that make customers buy again is the stable quality and satisfying service as follow in Figure 12.  
\( Y_1 \) means the stability of quality, which includes two parts:  
\( Y_{10} \) ------ the degree of quality-guaranteed system’s rationality and effectiveness, including quality control in purchase and production, final product testing control, and even the quality control concerning suppliers.  
\( Y_{11} \) ------ market feedback and customers satisfaction degree.  
\( Y_2 \) means the degree of service satisfaction, which includes two parts:  
\( Y_{20} \) ------ the degree of service quality-guaranteed system’s rationality and effectiveness, including before-sale service, after-sale service, and in-sale service;  
\( Y_{21} \) ------ market feedback and customer satisfaction degree  
Namely, \( F_3 = Y_1 + Y_2 \)
Therein, \( Y_1 = Y_{10} + Y_{11} \)
\( Y_2 = Y_{20} + Y_{21} \)

\( Y_{10} \) and \( Y_{20} \) are parameters for valuing an enterprise’s management system, which directly reflect the management level in the enterprise. Here we still adopt the evaluation method used above.

\( Y_{11} \) and \( Y_{21} \) reflects the market response to a product’s quality stability and service level.

By researching product A and B, get the result as follow:
\( F_3A = Y_{1A} + Y_{2A} = (Y_{10A} + Y_{11A}) + (Y_{20A} + Y_{21A}) \)
Suppose: \( Y_{10A} = 8 \) degree, \( Y_{11A} = 0 \) degree
\( Y_{20A} = 6 \) degree, \( Y_{21A} = 0 \) degree
Then, \( F_3A = 8 + 6 = 14 \) degree

Notice: because the enterprise does not list in market, so \( Y_{11A} = Y_{21A} = 0 \) degree
\( F_3B = Y_{1B} + Y_{2B} = (Y_{10B} + Y_{11B}) + (Y_{20B} + Y_{21B}) \)
Suppose: \( Y_{10B} = 8 \) degree, \( Y_{11B} = 0 \) degree
\( Y_{20B} = 6 \) degree, \( Y_{21B} = 0 \) degree

Notice: product A and B are in one brand in the enterprise.

Therefore, \( Y_{10A} = Y_{10B} = 8 \) degree
\( Y_{20A} = Y_{20B} = 6 \) degree
Get: \( F_3B = 8 + 6 = 14 \) degree

Considering the effect of competition on the repetitive force, suppose it is the repetitive force disturbing coefficient \( g_3 \), which reflect customers’ recognition to the service level and quality stability of product in competition. Get data by researches and statistical methods. Suppose the scope of \( g_3 \): \( 0 \leq g_3 \leq 1 \).

As the product in competition has stable quality and higher service level, \( g_3 \) ------ 0;
As the product in competition has poor quality stability and lower service level, \( g_3 \) ------ 1.

Introduce \( g_3 \) into the formula, get:
\( F_3 = g_3(Y_1 + Y_2) \) .................... Formula 3.8

Suppose \( g_3 = 0.6 \), then:
\( F_3A = g_3(Y_{1A} + Y_{2A}) = 0.6 \times 14 = 8.4 \) degree
\( F_3B = g_3(Y_{1B} + Y_{2B}) = 0.6 \times 14 = 8.4 \) degree

Notice: \( F_3A = F_3B = 8.4 \) degree. Because product A and B has the same brand and is operated by the same promotion center, the value is equal.

3.5 Compare the marketing force of product A and B

Suppose product A’s marketing force is \( \sum FA \) and product B’s marketing force is \( \sum FB \).

Suppose the weights of each force are respectively:
\( K_{0A} = 0.3, K_{1A} = 0.2, K_{2A} = 0.2, K_{3A} = 0.3 \)
\( K_{0B} = 0.4, K_{1B} = 0.2, K_{2B} = 0.2, K_{3B} = 0.2 \)

To sum up,
\( \sum FA = K_{0AF0A} + K_{1AF1A} + K_{2AF2A} + K_{3AF3A} \)
\( = 0.3 \times 19.5 + 0.2 \times 12 + 0.2 \times 11.2 + 0.3 \times 8.4 = 13.01 \) degree
\( \sum FB = K_{0BF0B} + K_{1BF1B} + K_{2BF2B} + K_{3BF3B} \)
\( = 0.4 \times 25.5 + 0.2 \times 9.6 + 0.2 \times 12.8 + 0.2 \times 8.4 = 16.36 \) degree

Conclusion:
\( \sum FA - \sum FB = 13.01 - 16.36 = -3.35 \) degree
Namely, \( \sum FB > \sum FA \)
So, product B has bigger marketing force than product A.

3.6 Static quantitative analysis of product A and B’s sales growth
Because $Q = K \times \sum F/S$

So,

$QA = KA \times \sum FA/SA$

$QB = KB \times \sum FB/SB$

Suppose $KA = KB = 1$ (resources are same)

$SA = SB = S0 + S1$, here $S0 = 1$, $S1 = 3$ (wholesaler system), then $S0 + S1 = 4$ grade

Then,

$QA = KA \times \sum FA/SA = 1 \times 13.01/4 = 3.25$ degree/grade

$QB = KB \times \sum FB/SB = 1 \times 16.36/4 = 4.09$ degree/grade

Conclusion: $QB > QA$

The future sales growth of product B is bigger than that of product A.

If other parameters change, QA and QB will have different results.

For example, if product A adopts direct selling, namely $S1A = 1$, and product B adopts a franchiser system, namely $S1B = 3$, and other coefficients do not change, then $QA = KA \times \sum FA/SA$.

Because $SA = S0A + S1A = 1 + 1 = 2$ grade

So, $QA = 1 \times 13.01/2 = 6.51$ degree/grade

$QB = KB \times \sum FB/SB$

Because $SB = S0B + S1B = 1 + 3 = 4$ grade

So, $QB = 1 \times 16.36/4 = 4.09$ degree/grade

Conclusion: if product A adopts the direct selling system and product B adopts the franchiser system, with the precondition of regardless of expenses of sales, the future sales growth of product A will far surpass that of product B. The former is 1.59 times of the latter ($QA/QB = 6.51/4.09 = 1.59$).

References


Figure 1. Marketing Static Circular System

Figure 2.

Figure 3.
Figure 4.

Figure 5.

Figure 6.
Figure 11.

Figure 12.