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The Impact of Semantic Autonomy and Semantic Seeding on Business Turnover

-- Take Tencent as an Example

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Abstract

As more and more companies join the market, the competition among enterprises becomes extremely fierce. In order to make their brands gain a place in the market, the impact of the name of the company on the company is very significant. There are two main ways for existing companies to create new sub-products or subsidiaries. Semantic autonomy and semantic seeding. Semantic autonomy is that the company's sub-products or subsidiaries are completely independent of the parent company's brand name. Semantic sowing is the enterprise or product. The name contains at least the parent company part name. Different naming methods have different impacts on enterprises. In order to verify the relationship between the two different naming methods and the company's annual turnover, this paper takes Tencent as an example to analyze its subsidiaries or subsidiaries as Tencent. The relationship of turnover brought. Collect Tencent's business data and annual turnover data, and use the generalized square model to analyze the relationship between Tencent's annual turnover and annual net profit in two different ways: semantic autonomy and semantic seeding. Through experimental analysis, there is a linear correlation between two different naming methods and total turnover and net profit. Semantic autonomy and semantic communication and Tencent's total revenue and net profit may be synchronous growth, that is, linear synchronization.

Keywords

Semantic Autonomy; Semantic Seeding; Linear Correlation; Generalized Square.

1. Introduction

In the ever-increasing global competitive market environment, in order to survive, the company needs to have its own brand and promote it to the market. In order to differentiate itself, the company needs to innovate strategically. How to enter the market and make its brand be recognized by the public Acceptance is a problem that every company needs to consider. It is related to the future development of the company. Launching some new products and opening new markets have become common strategies for companies [1]-[4]. A company name is one of the key elements of a corporate brand. Its naming itself is a kind of business marketing activity, and the extension of the name can indicate the category of the brand [5]. The corporate brand is not only the external performance of an organization, its name, logo and visual performance can define its core values [6]. The strategy of using the company's existing brand to enter new markets, new products or new industries is called brand extension. In this way, companies can use existing well-known brands to enter new markets. This growth strategy has been adopted by many companies and has become more and more popular in recent years [7]. Keller defines corporate brand equity (CBE) as the different responses of consumers, customers, employees, other companies or any related customers to the words, behaviors,

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communications, products or services provided by corporate brand entities. When stakeholders have strong, beneficial and unique associations with the corporate brand in their memory, a company is said to have a strong CBE [8]. Although people have realized that using brand extension as a marketing strategy to launch new products is very important [9], little is known about how consumers react. Consumers' response to brand extensions seems to involve a classification process. In this process, new products are judged based on the perception of the similarity between the parent company's brand and extension, and consumers' perception of the quality of core products related to the brand. of. There are also some companies that completely use names that have nothing to do with the parent company when they are established. This has two effects. One is because they have no brand effect and it is difficult to enter the market, thus making new companies face a greater risk of failure, because it will Exacerbate the uncertainty surrounding the market [10]. On the other hand, it will also provide a lot of room for self-innovation in the business of your own enterprise. If you make your own brand, it will make a large share in the market. When entering the market, it will attract a lot due to its novelty. The favor of customers. In general, there are two ways of naming subsidiaries, semantic autonomy and semantic seeding. Semantic autonomy means that the naming of the subsidiary does not overlap with the name of the parent company. It uses a completely new name to establish an autonomous identity [11]. Semantic seeding means that the name of a subsidiary company at least partially retains the existing name of its parent company [12]. Many companies are willing to reflect the shadow of the parent company more or less when creating a subsidiary company, especially if they want to use the parent company's reputation. And the company that opens the market.

The name of the enterprise is the symbol of the enterprise and the intangible asset of the enterprise. The name of the enterprise is the first way for the public to understand the enterprise. More and more companies have shifted the importance of corporate branding from a purely marketing communication perspective to a strategic and corporate-wide initiative. Therefore, the marketing and management of corporate brand has become a strategic need in today's highly regulated and turbulent business environment. Therefore, it is necessary to evaluate the value of corporate brand to help strategically evaluate its impact on the company. Without an effective way to measure corporate brands, companies will not be able to evaluate how corporate brands enhance or weaken corporate performance, and how they increase or decrease the value of corporate reputation and reputation. Some environmental trends appearing in the market have increased the importance of corporate brands. Fast-paced product introductions, expansion of the diversity of sales channels, and the diversity of communication channels all have an important impact on corporate brand strategies [13]. The popularity of a company has a lot to do with its naming. Improving the reputation of a company and strengthening its competitiveness play a vital role in the development of a company. This article analyzes the naming methods of Tencent and its products, the benefits to Tencent in different years, and the different benefits that different naming brings to the company.

2. Research Background and Hypothesis

At present, the development space of the Internet industry in our country is unprecedented, and the development of e-commerce is changing with each passing day [14][15]. With the arrival of the big data era, corporate marketing concepts and models have undergone tremendous changes. Companies need to adapt to the new requirements of the times and formulate corresponding brand marketing strategies. In the era of big data, there are many new features in corporate marketing. Big data has changed the basic values of corporate marketing, marketing is more precise, and marketing images are more diversified [16] [17]. Tencent is one of the largest Internet companies in my country. Founded on November 11, 1998, it is currently

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one of the largest Internet integrated service providers in China and one of the Internet companies serving the most users in China. While occupying the large-scale market of my country's Internet industry, Tencent is also slowly expanding its influence to other businesses. Later, Tencent launched a variety of different application software. After attracting many users, Tencent's business has also expanded rapidly in various fields [18]. Tencent takes "providing users with one-stop online life services" as its strategic goal. Based on this, it has completed its business layout and built four major online platforms: QQ, Tencent.com, QQ games and Paipai.com, forming a Chinese scale. The largest online community. In terms of meeting the needs of users for information transmission and knowledge acquisition, Tencent has the portal site Tencent, QQ instant messaging tool, QQ mailbox and SOSO search; in terms of meeting user group communication and resource sharing, Tencent's Qzone has become China's largest individual Space: In terms of satisfying users' individual display and entertainment needs, Tencent has very successful virtual image products such as QQshow, QQ pets, QQ games and QQMusic. Tencent has many sub-products, and the naming of these sub-products has a different impact on Tencent. The concept of brand has a history of several centuries. To a certain extent, brand means the excellent and reliable quality of a certain product, including quality, thoughtful service, positive and healthy concepts [19]. Brand naming does not only refer to the name planning activities of a certain commercial brand, but includes various forms such as corporate company naming and brand naming. Enterprise naming focuses on inclusiveness and philosophy, and there are many factors that need to be considered. In order to analyze the profits that the sub-products under different naming methods bring to Tencent, we put forward four hypotheses in this article.

Hypothesis 1: Semantic autonomy has a linear relationship with Tencent's annual total operating income. Semantic autonomy products are linearly related to Tencent's annual total turnover, that is, the operating income brought by semantic autonomy to Tencent and Tencent's annual total turnover are linearly related.

Hypothesis 2: Semantic autonomy has a linear relationship with Tencent's annual net profit. Semantic autonomy products are linearly related to Tencent's annual net profit, that is, the operating income brought by semantic autonomy to Tencent is linearly related to Tencent's annual net profit.

Hypothesis 3: Semantic seeding has a linear relationship with Tengxu's annual total operating income. Semantic seeding products are linearly related to the total annual turnover of Tencent, that is, the operating income that semantic seeding brings to Tencent and the total annual turnover of Tencent meet a linear relationship.

Hypothesis 4: Semantic seeding has a linear relationship with Tencent's annual net profit. Semantic seeding products are linearly related to Tencent's annual net profit, that is, the operating income that semantic seeding brings to Tencent and Tencent's annual net profit are linearly correlated.

3. Data and Model Evaluation

3.1. Data Set

In order to verify our hypothesis, we collected business data sets of Tencent's different sub-products and Tencent's annual profit income, mainly including Tencent's social, financial, entertainment, information, tools, platforms, and artificial intelligence. Business data. The data set includes the time when Tencent's business was launched, and the operating income that the business product brought to Tencent in each year. From 2004 to 2007, we included the operating income of Semantic Autonomy and Semantic Seeding to Tencent, as well as Tencent's annual total operating income and annual net profit data. Each year's profit income is subdivided into each quarter's net profit and total operating income.

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3.2. Model Evaluation

Tencent's annual total operating income is regarded as a time series:

$$y1_i \; i = 1,2,3,\ldots,14 \tag{1}$$

Tencent's annual net profit is regarded as a time series:

$$y2_i \; i = 1,2,3,\ldots,14 \tag{2}$$

Semantic autonomy is regarded as a time series:

$$x1_i \; i = 1,2,3,\ldots,14 \tag{3}$$

Think of semantic seeding as a time series:

$$x2_i \; i = 1,2,3,\ldots,14 \tag{4}$$

Assume

$$\begin{aligned} y1_i &= b_0 + b_1 x1_i + u0_i \\ y1_i &= b_2 + b_3 x2_i + u1_i \end{aligned} \tag{5}$$

$$\begin{aligned} y2_i &= b_4 + b_5 x1_i + u2_i \\ y2_i &= b_6 + b_7 x2_i + u3_i \end{aligned}$$

Where $u0_i$, $u2_i$, $u3_i$, $u4_i$ is the disturbance term.
Use ordinary least squares method to get:

$$\begin{aligned} \widehat{y1_i} &= \widehat{b_0} + \widehat{b_1} x1_i \\ \widehat{y1_i} &= \widehat{b_2} + \widehat{b_3} x2_i \\ \widehat{y2_i} &= \widehat{b_4} + \widehat{b_5} x1_i \\ \widehat{y2_i} &= \widehat{b_6} + \widehat{b_7} x2_i \end{aligned} \tag{6}$$

The actual calculation result is:

$$\begin{aligned} \widehat{y1_i} &= -523.675 + 115.1858 x1_i \\ \widehat{y1_i} &= -561.102 + 122.0868 x2_i \\ \widehat{y2_i} &= -192.583 + 43.17511 x1_i \\ \widehat{y2_i} &= -205.465 + 45.63444 x2_i \end{aligned} \tag{7}$$

The linear model established by the ordinary least squares method gives semantic autonomy and Tencent's annual total revenue, semantic seeding and Tencent's annual total revenue, semantic autonomy and Tencent's annual net profit, and semantic seeding and Tencent's annual net profit. This result does not consider whether the disturbance term is autocorrelated. Whether the disturbance term is autocorrelated can be tested by Durbin-Watson method.

$$y1_i = b_0 + b_1 x1_i + u0_i$$

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$$\begin{aligned} y1_i &= b_2 + b_3x2_i + u1_i \\ y2_i &= b_4 + b_5x1_i + u2_i \\ y2_i &= b_6 + b_7x2_i + u3_i \end{aligned} \tag{8}$$

use ordinary least squares to get

$$\begin{aligned} \widehat{y1}_i &= \widehat{b_0} + \widehat{b_1}x1_i \\ \widehat{y1}_i &= \widehat{b_2} + \widehat{b_3}x2_i \\ \widehat{y2}_i &= \widehat{b_4} + \widehat{b_5}x1_i \\ \widehat{y2}_i &= \widehat{b_6} + \widehat{b_7}x2_i \end{aligned} \tag{9}$$

then

$$\begin{aligned} e0_i &= y1_i - \widehat{y1}_i = b_0 + b_1x1_i + u0_i - (\widehat{b_0} + \widehat{b_1}x1_i) \\ e1_i &= y1_i - \widehat{y1}_i = b_2 + b_3x2_i + u1_i - (\widehat{b_2} + \widehat{b_3}x2_i) \\ e2_i &= y2_i - \widehat{y2}_i = b_4 + b_5x1_i + u2_i - (\widehat{b_4} + \widehat{b_5}x1_i) \\ e3_i &= y2_i - \widehat{y2}_i = b_6 + b_7x2_i + u3_i - (\widehat{b_6} + \widehat{b_7}x2_i) \end{aligned} \tag{10}$$

The Durbin-Watson statistic is defined as:

$$\begin{aligned} d_0 &= \frac{\sum_{i=2}^{n}(e0_i - e0_{i-1})^2}{\sum_{i=1}^{n} {e0_i}^2} \\ d_1 &= \frac{\sum_{i=2}^{n}(e1_i - e1_{i-1})^2}{\sum_{i=1}^{n} {e1_i}^2} \\ d_2 &= \frac{\sum_{i=2}^{n}(e2_i - e2_{i-1})^2}{\sum_{i=1}^{n} {e2_i}^2} \\ d_3 &= \frac{\sum_{i=2}^{n}(e3_i - e3_{i-1})^2}{\sum_{i=1}^{n} {e3_i}^2} \end{aligned} \tag{11}$$

The Durbin-Watson test calculation table is:

Table 1. Durbin-Watson Test Table 1

	$x1_i$	$y1_i$	$\widehat{y1}_i$	$e0_i$	${e0_i}^2$	$e0_i * e0_{i-1}$	$e0_i - e0_{i-1}$	$(e0_i - e0_{i-1})^2$
2004	3	11.435	-178.118	189.5526	35930.18	14632.66	-112.357	12624.04
2005	4	14.264	-62.9318	77.19581	5959.193	-10763.9	-216.632	46929.21
2006	6	28.004	167.4397	-139.436	19442.32	18019.37	10.205	104.142
2007	6	38.209	167.4397	-129.231	16700.58	12392.54	33.336	1111.289
2008	6	71.545	167.4397	-95.8947	9195.795	4127.28	52.855	2793.651
2009	6	124.4	167.4397	-43.0397	1852.416	-1249.02	72.06	5192.644
2010	6	196.46	167.4397	29.02029	842.1775	67.77794	-26.6848	712.0763
2011	7	284.961	282.6255	2.335536	5.454729	96.05074	38.79024	1504.683
2012	8	438.937	397.8112	41.12578	1691.33	-979.317	-64.9385	4217.011
2013	10	604.37	628.1827	-23.8127	567.0465	-3837.12	184.95	34206.5
2014	10	789.32	628.1827	161.1373	25965.22	-9715.9	-221.433	49032.59
2015	14	1028.63	1088.926	-60.2958	3635.58	8771.501	-85.1788	7255.426
2016	19	1519.38	1664.855	-145.475	21162.85	-19903.3	282.2912	79688.33
2017	24	2377.6	2240.783	136.8166	18718.79			
sum	129	7527.515			161668.9	11658.64		245371.6

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get:

$$d_0 = \frac{\sum_{i=2}^{n}(e0_i - e0_{i-1})^2}{\sum_{i=1}^{n} e0_i{}^2} = \frac{245371.6}{161668.9} = 1.51774 \quad (12)$$

For $\alpha = 0.05, k = 1, n = 14$, Check the Durbin-Watson test table to get

$$d_L = 1.045, d_U = 1.35 \quad (13)$$

$d_0 > d_l$, accept $H_0 : \rho = 0$ The disturbance term is negatively correlated.

get:

$$d_1 = \frac{\sum_{i=2}^{n}(e1_i - e1_{i-1})^2}{\sum_{i=1}^{n} e1_i{}^2} = \frac{641566.1}{721569.3} = 0.889126 \quad (14)$$

For $\alpha = 0.05, k = 1, n = 14$, Check the Durbin-Watson test table to get

$$d_L = 1.045, d_U = 1.35 \quad (15)$$

$d_1 < d_L$, refuse $H_0 : \rho = 0$ the disturbance term is positively correlated

Table 2. Durbin-Watson Test Table 2

	$x2_i$	$y1_i$	$\widehat{y1}_i$	$e1_i$	$e1_i{}^2$	$e1_i * e1_{i-1}$	$e1_i - e1_{i-1}$	$(e1_i - e1_{i-1})^2$
2004	4	11.435	-72.7545	84.18951	7087.874	7326.047	2.829	8.003241
2005	4	14.264	-72.7545	87.01851	7572.222	8767.856	13.74	188.7876
2006	4	28.004	-72.7545	100.7585	10152.28	-1120.77	-111.882	12517.54
2007	5	38.209	49.33232	-11.1233	123.7282	-247.079	33.336	1111.289
2008	5	71.545	49.33232	22.21268	493.4033	1667.455	52.855	2793.651
2009	5	124.4	49.33232	75.06768	5635.157	11044.53	72.06	5192.644
2010	5	196.46	49.33232	147.1277	21646.56	-19219.6	-277.759	77150.34
2011	8	284.961	415.5928	-130.632	17064.67	28847.35	-90.1977	8135.618
2012	10	438.937	659.7665	-220.829	48765.66	39193.55	43.34617	1878.89
2013	11	604.37	781.8533	-177.483	31500.32	42011.54	-59.2237	3507.442
2014	13	789.32	1026.027	-236.707	56030.19	86080.26	-126.95	16116.43
2015	16	1028.63	1392.287	-363.657	132246.8	-1820.36	368.6632	135912.5
2016	17	1519.38	1514.374	5.005705	25.05708	3098.792	614.0463	377052.9
2017	19	2377.6	1758.548	619.052	383225.4			
sum	126	7527.515			721569.3	205629.6		641566.1

get:

$$d_2 = \frac{\sum_{i=2}^{n}(e2_i - e2_{i-1})^2}{\sum_{i=1}^{n} e2_i{}^2} = \frac{51195.85}{27682.49} = 1.8494 \quad (16)$$

For $\alpha = 0.05, k = 1, n = 14$, Check the Durbin-Watson test table to get

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Table 3. Durbin-Watson Test Table 3

	$x1_i$	$y2_i$	$\widehat{y2}_i$	$e2_i$	${e2_i}^2$	$e2_i * e2_{i-1}$	$e2_i - e2_{i-1}$	$(e2_i - e2_{i-1})^2$
2004	3	4.467	-63.0577	67.52475	4559.591	1665.338	-42.8621	1837.16
2005	4	4.78	-19.8826	24.66264	608.2457	-1352.37	-79.4972	6319.808
2006	6	11.633	66.46758	-54.8346	3006.831	2748.176	4.717	22.25009
2007	6	16.35	66.46758	-50.1176	2511.772	1704.378	16.11	259.5321
2008	6	32.46	66.46758	-34.0076	1156.515	212.9752	27.745	769.785
2009	6	60.205	66.46758	-6.26258	39.2199	-199.867	38.177	1457.483
2010	6	98.382	66.46758	31.91442	1018.53	411.4507	-19.0221	361.8406
2011	7	122.535	109.6427	12.89231	166.2117	25.47783	-10.9161	119.1614
2012	8	154.794	152.8178	1.976203	3.90538	-93.3322	-49.2042	2421.055
2013	10	191.94	239.168	-47.228	2230.485	-3128.95	113.48	12877.71
2014	10	305.42	239.168	66.25199	4389.326	-370.908	-71.8504	5162.485
2015	14	406.27	411.8684	-5.59845	31.34262	372.7111	-60.9755	3718.017
2016	19	561.17	627.744	-66.574	4432.096	-3954.53	125.9745	15869.56
2017	24	903.02	843.6195	59.40047	3528.415			
sum	129	2873.426			27682.49	-1959.44		51195.85

$$d_L = 1.045, d_U = 1.35 \tag{17}$$

$d_2 > d_L$, accept $H_0 : \rho = 0$ The disturbance term is considered to be negatively correlated.
get:

$$d_3 = \frac{\sum_{i=2}^{n}(e3_i - e3_{i-1})^2}{\sum_{i=1}^{n} {e3_i}^2} = \frac{96997.99}{110702} = 0.8762 \tag{18}$$

For $\alpha = 0.05, k = 1, n = 14$, Check the Durbin-Watson test table to get

$$d_L = 1.045, d_U = 1.3 \tag{19}$$

$d_3 < d_L$, refuse $H_0 : \rho = 0$ the disturbance term is positively correlated

From the above test, we can see the disturbance of the linear relationship between semantic autonomy and Tencent's annual total revenue from 2004 to 2017, semantic autonomy and Tencent's annual net profit, semantic seeding and Tencent's annual total revenue, and semantic seeding and Tencent's annual net profit. The terms are positively correlated, and generalized least squares method can be used.

If the disturbance term is positively correlated, let

$$\begin{aligned} Y1 &= X1B1 + U1 \\ Y1 &= X2B2 + U2 \\ Y2 &= X1B3 + U3 \\ Y2 &= X2B4 + U4 \end{aligned} \tag{20}$$

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Table 4. Durbin-Watson Test Table 4

	$x2_i$	$y2_i$	$\widehat{y2}_i$	$e3_i$	${e3_i}^2$	$e3_i * e3_{i-1}$	$e3_i - e3_{i-1}$	$(e3_i - e3_{i-1})^2$
2004	4	4.467	-22.9275	27.39449	750.4582	759.0326	0.313	0.097969
2005	4	4.78	-22.9275	27.70749	767.7051	957.5845	6.853	46.96361
2006	4	11.633	-22.9275	34.56049	1194.428	-219.699	-40.9174	1674.237
2007	5	16.35	22.70695	-6.35695	40.41081	-61.9996	16.11	259.5321
2008	5	32.46	22.70695	9.75305	95.12199	365.7204	27.745	769.785
2009	5	60.205	22.70695	37.49805	1406.104	2837.667	38.177	1457.483
2010	5	98.382	22.70695	75.67505	5726.713	-2805.67	-112.75	12712.64
2011	8	122.535	159.6103	-37.0753	1374.576	3562.383	-59.0099	3482.166
2012	10	154.794	250.8792	-96.0852	9232.357	10047.97	-8.48844	72.05363
2013	11	191.94	296.5136	-104.574	10935.64	8612.941	22.21112	493.3337
2014	13	305.42	387.7825	-82.3625	6783.578	9753.019	-36.0533	1299.842
2015	16	406.27	524.6858	-118.416	14022.3	1083.533	109.2656	11938.96
2016	17	561.17	570.3202	-9.15024	83.72696	-2209.15	250.5811	62790.9
2017	19	903.02	661.5891	241.4309	58288.87			
sum	126	2873.426			110702	32683.33		96997.99

$$Y1 = \begin{pmatrix} y1_1 \\ y1_2 \\ \dots \\ y1_n \end{pmatrix} \quad Y2 = \begin{pmatrix} y2_1 \\ y2_2 \\ \dots \\ y2_n \end{pmatrix} \tag{21}$$

$$X1 = \begin{pmatrix} 1 & x1_1 \\ 1 & x1_2 \\ 1 & \dots \\ 1 & x1_n \end{pmatrix} \quad X2 = \begin{pmatrix} 1 & x2_1 \\ 1 & x2_2 \\ 1 & \dots \\ 1 & x2_n \end{pmatrix} \tag{22}$$

$$B1 = \begin{pmatrix} b_0 \\ b_1 \end{pmatrix} \; B2 = \begin{pmatrix} b_2 \\ b_3 \end{pmatrix} \; B3 = \begin{pmatrix} b_4 \\ b_5 \end{pmatrix} \; B4 = \begin{pmatrix} b_6 \\ b_7 \end{pmatrix} \tag{23}$$

$$U1 = \begin{pmatrix} u0_1 \\ u0_2 \\ \dots \\ u0_n \end{pmatrix} U2 = \begin{pmatrix} u1_1 \\ u1_2 \\ \dots \\ u1_n \end{pmatrix} U3 = \begin{pmatrix} u2_1 \\ u2_2 \\ \dots \\ u2_n \end{pmatrix} U4 = \begin{pmatrix} u3_1 \\ u3_2 \\ \dots \\ u3_n \end{pmatrix} \tag{24}$$

The parameter estimation form obtained by the generalized least square method is:

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$$\widehat{B} = (X'\Omega^{-1}X)^{-1}X'\Omega^{-1} \tag{25}$$

It has the best linear unbiased characteristics:
among them:

$$\Omega = \begin{pmatrix} 1 & \rho & \rho^2 & \dots & \rho^{n-1} \\ \rho & 1 & \rho & \dots & \rho^{n-2} \\ \rho^2 & \rho & 1 & \dots & \rho^{n-3} \\ \dots & \dots & \dots & \dots & \dots \\ \rho^{n-1} & \rho^{n-2} & \rho^{n-3} & \dots & 1 \end{pmatrix} \tag{26}$$

$$\Omega^{-1} = \frac{1}{1-\rho^2}\begin{pmatrix} 1 & -\rho & 0 & \dots & 0 & 0 \\ -\rho & 1+\rho^2 & -\rho & \dots & 0 & 0 \\ 0 & -\rho & 1+\rho^2 & \dots & 0 & 0 \\ \dots & \dots & \dots & \dots & \dots & \dots \\ 0 & 0 & 0 & \dots & 1+\rho^2 & -\rho \\ 0 & 0 & 0 & \dots & -\rho & 1 \end{pmatrix} \tag{27}$$

ρ can be replaced by its estimate $\hat{\rho} \approx \frac{\sum_{i=2}^{n} e_i e_{i-1}}{\sum_{i=1}^{n} {e_i}^2}$. Using the calculation results in the table, we get:

$$\begin{aligned} \widehat{\rho 1} &\approx \frac{\sum_{i=2}^{n} e0_i e0_{i-1}}{\sum_{i=1}^{n} {e0_i}^2} = \frac{11658.64}{161668.9} = 0.072 \\ \widehat{\rho 2} &\approx \frac{\sum_{i=2}^{n} e1_i e1_{i-1}}{\sum_{i=1}^{n} {e1_i}^2} = \frac{205629.6}{721569.3} = 0.285 \\ \widehat{\rho 3} &\approx \frac{\sum_{i=2}^{n} e2_i e2_{i-1}}{\sum_{i=1}^{n} {e2_i}^2} = \frac{-1959.44}{27682.49} = -0.07 \\ \widehat{\rho 4} &\approx \frac{\sum_{i=2}^{n} e3_i e3_{i-1}}{\sum_{i=1}^{n} {e3_i}^2} = \frac{32683.33}{110702} = 0.295 \end{aligned} \tag{28}$$

Using the mathematical software Mathcad to calculate:
for ρ1:

$$\begin{aligned} (X1'\Omega 1^{-1}X1) &= \frac{1}{1-0.072^2}\begin{pmatrix} 12.1904 & 112.8984 \\ 112.8967 & 1466.4458 \end{pmatrix} \\ &= \begin{pmatrix} 12.2514 & 113.4629 \\ 113.4612 & 1473.7780 \end{pmatrix} \end{aligned} \tag{29}$$

$$(X1'\Omega 1^{-1}Y1) = \frac{1}{1-0.072^2}\begin{pmatrix} 6642.283456 \\ 110009.3 \end{pmatrix} = \begin{pmatrix} 6675.4949 \\ 110559.3465 \end{pmatrix} \tag{30}$$

$$\widehat{B1} = \begin{pmatrix} \widehat{b_0} \\ \widehat{b_1} \end{pmatrix} = (X1'\Omega 1^{-1}X1)^{-1}(X1'\Omega 1^{-1}Y1) = \begin{pmatrix} -522.738939 \\ 119.1491 \end{pmatrix} \tag{31}$$

for ρ2:

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$$(X2'\Omega 2^{-1}X2) = \frac{1}{1-0.285^2}\begin{pmatrix} 7.5644 & 69.0986 \\ 69.1011 & 857.155 \end{pmatrix} = \begin{pmatrix} 8.2331 & 75.2070 \\ 75.2096 & 932.9275 \end{pmatrix} \quad (32)$$

$$(X2'\Omega 2^{-1}Y1) = \frac{1}{1-0.285^2}\begin{pmatrix} 4334.9510 \\ 68344.34 \end{pmatrix} = \begin{pmatrix} 4718.1607 \\ 74385.9797 \end{pmatrix} \quad (33)$$

$$\widehat{B2} = \begin{pmatrix} \widehat{b_2} \\ \widehat{b_3} \end{pmatrix} = (X2'\Omega 2^{-1}X2)^{-1}(X2'\Omega 2^{-1}Y1) = \begin{pmatrix} -585.5914 \\ 129.9388 \end{pmatrix} \quad (34)$$

for ρ3:

$$(X1'\Omega 3^{-1}X1) = \frac{1}{1-(-0.07)^2}\begin{pmatrix} 15.8788 & 145.6698 \\ 145.6698 & 1841.0234 \end{pmatrix} = \begin{pmatrix} 15.9582 & 146.3981 \\ 146.3981 & 1850.2285 \end{pmatrix} \quad (35)$$

$$(X1'\Omega 3^{-1}Y2) = \frac{1}{1-(-0.07)^2}\begin{pmatrix} 3221.8147 \\ 51331.38 \end{pmatrix} = \begin{pmatrix} 3237.9238 \\ 51588.0369 \end{pmatrix} \quad (36)$$

$$\widehat{B3} = \begin{pmatrix} \widehat{b_4} \\ \widehat{b_5} \end{pmatrix} = (X1'\Omega 3^{-1}X1)^{-1}(X1'\Omega 3^{-1}Y2) = \begin{pmatrix} -193.5541 \\ 44.5697 \end{pmatrix} \quad (37)$$

for ρ4:

$$(X2'\Omega 4^{-1}X2) = \frac{1}{1-0.295^2}\begin{pmatrix} 7.374 & 67.406 \\ 67.4085 & 837.6548 \end{pmatrix} = \begin{pmatrix} 8.0769 & 73.8311 \\ 73.8339 & 917.5001 \end{pmatrix} \quad (38)$$

$$(X2'\Omega 4^{-1}Y2) = \frac{1}{1-0.295^2}\begin{pmatrix} 1616.85 \\ 25364.7 \end{pmatrix} = \begin{pmatrix} 1770.9681 \\ 27782.4632 \end{pmatrix} \quad (39)$$

$$\widehat{B4} = \begin{pmatrix} \widehat{b_6} \\ \widehat{b_7} \end{pmatrix} = (X2'\Omega 4^{-1}X2)^{-1}(X2'\Omega 4^{-1}Y2) = \begin{pmatrix} -218.0545 \\ 47.1426 \end{pmatrix} \quad (40)$$

The linear relationship between semantic autonomy and Tencent's total annual revenue:

$$\widehat{y1}_i = -522.738939 + 119.1491x1_i \quad (41)$$

The linear relationship between semantic seeding and Tencent's total annual revenue:

$$\widehat{y1}_i = -585.5914 + 129.9388x2_i \quad (42)$$

The linear relationship between semantic autonomy and Tencent's annual net profit:

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$$\widehat{y2}_i = -193.5541 + 44.5697x1_i \quad (43)$$

The linear relationship between semantic seeding and Tencent's annual net profit:

$$\widehat{y2}_i = -218.0545 + 45.63444x2_i \quad (44)$$

This result takes into account the autocorrelation of the disturbance term and has the best linear and unbiased characteristics. Use this as the predictive equation
The effect is better than the original regression equation.

4. Experimental Results and Analysis

Descriptive statistics of experimental results This article collects the names and launch times of Tencent's businesses (products) from 2004 to 2017, including seven modules of social networking, finance, entertainment, information, tools, platforms, and artificial intelligence. And Tencent's annual total revenue and net profit data. In order to explore the relationship between semantic autonomy and semantic communication on the company's total revenue and net profit, we defined the following variables. Semantic autonomy, which is a count variable that captures the number of new business names of Tencent in a given year. As mentioned earlier, when the sub-business name and the main business name do not overlap with a single word, semantic autonomy is instantiated. For example: Tencent was founded in 1998, launched three semantic autonomous services before 2004, and launched the fourth in 2005. Then the variable will be displayed as 3 between 2004 and 4 in 2005. In our data set, the minimum value of this variable is 3 and the maximum value is 24. Semantic propagation, which is a count variable that captures the number of new business names of Tencent in a given year. As mentioned earlier, when the sub-business name is Overlap with the main business name characters, instantiation semantics propagation. For example: Tencent was founded in 1998, launched 4 semantic communication services before 2004, and did not launch a new semantic communication service in 2005. Then the variable will be displayed as 4 between 2004 and 4 in 2005. In our data set, the minimum value of this variable is 4 and the maximum value is 19. According to the above statistics, we get the curve of the number of semantic autonomies, semantic communication, the company's annual total revenue, and the company's annual total profit over time. As time moves, the total amount of semantic autonomy and semantic seeding has shown an increasing trend, and the increasing trend is getting faster and faster with time. This shows that since the establishment of Tencent, the company has expanded in various businesses more and more. New businesses are launched every year to adapt to today's social development. Tencent’s annual total operating income and net profit have increased, and as time goes on, its growth rate is getting faster and faster, which has a lot to do with Tencent’s continuous launch of new products. This shows that Tencent's strategic decision is correct.

It can be seen that with the increase of time, the variables of semantic autonomy and semantic dissemination continue to rise, and Tencent's performance has also become a growth trend. The growth rate of semantic autonomy and semantic dissemination and the growth rate of Tencent's performance (total revenue and net profit) have been slow at first and then fast specialty. Based on this phenomenon, this article proposes a conjecture that semantic autonomy and semantic dissemination may have a synchronous growth relationship with Tencent’s total revenue and net profit, that is linear synchronization. The linear relationship between semantic autonomy and Tencent's annual total revenue is in this data set. The linear relationship between semantic autonomy variable semantic seeding and Tencent's annual total revenue is linear relationship between semantic autonomy and Tencent's annual net profit.

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Semantic seeding and Tencent's annual net profit the linear relationship of profitability. In its future business, Tencent should continue to launch new products or businesses that adapt to the tastes of the general public as it did before.

5. Summary and Outlook

The names of companies and their products have a direct impact on consumers' purchases. Therefore, every business operator will carefully design the name of the business. A corporate name with a highly generalized vitality and strong appeal will have an impact on the public's visual stimulation and psychological aspects. Consider many factors when naming companies and products. There are two main naming methods, semantic autonomy and semantic seeding. Semantic autonomy means that the company's sub-products or subsidiaries are completely unrelated to the parent company's brand name and are completely new; semantic seeding means that the company's or product's name contains at least part of the parent company's name. This article analyzes Tencent's annual operating income through the different naming methods of Tencent's sub-products. Put forward four hypotheses, and verify the hypothesis by constructing the model and analyzing the experimental results, that is, the two different naming methods of Tengxu's sub-products are linearly related to the operating income and annual net profit of Tencent., That is, the two naming methods of Yi Autonomy and Semantic Communication and Tencent's total revenue and net profit may have a simultaneous growth relationship, that is, linear synchronization. It is of guiding significance for enterprises to make correct decisions, is of reference value for the naming of new products or new subsidiaries when they are established, and helps the company to better name naming.

This article mainly focuses on the analysis of Tencent's business. In the following research, we can compare the naming methods of products of the same business under different companies on the proportion of the impact on the company, and the specific effects of these two naming methods can be quantified. What is the impact factor of the company's overall operating income? It is also possible to analyze the two different naming methods for the company's market share in the entire industry to illustrate the degree of influence of the two methods on the market share.

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