

Research on 4V Marketing Strategy of Physical Bookstore Based on Consumer Behavior

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Abstract—The physical bookstore is an important terminal for the realization of economic value and cultural value. However, with the development of online bookstores and e-books, the share of physical bookstores in the book market was squeezed. The relationship between consumer behavior and physical bookstore management has not been verified. Therefore, based on consumer behavior theory, the purpose of this paper is to study the relationship between consumers and physical bookstores, and to improve from the 4V strategy. The study was to collect data related to consumers and physical bookstores and to study their interrelationships using VAR models and related tests. My research results show that the income of the physical bookstore is affected by the digital reading rate, the number of social public libraries and national publications. Therefore, the physical bookstore needs to accurately grasp the consumer demand and create the advantages that digital reading does not have, so it needs the 4V strategy and the accuracy of the physical bookstore. Combine. The study links consumer-related behaviors to physical bookstore revenues through VARs. Research results may be beneficial to relevant managers, especially in understanding where consumers' behaviors have the greatest impact on physical bookstore revenues and development, enabling companies to have macro The direction provides some help for the development of the physical bookstore strategy.

Keywords—consumer behavior; physical bookstore; 4V strategy

I. INTRODUCTION

As a carrier of inheriting excellent cultural heritage, promoting cultural market prosperity and promoting the development of cultural industry, the physical bookstore promotes the dissemination of advanced ideas, leads the reading of the whole people, and embodies the exchanges of readers, authors and scholars. The healthy development of physical bookstores is the need of social development and an inevitable requirement of the times. In 2018, the size of China's book retail market reached 89.4 billion yuan, of which online bookstores accounted for 57.3 billion yuan, and Physical bookstores accounted for 32.1 billion yuan, compared to 2017 physical bookstore retail market sales. It fell by 6.69%[1].Two Sides organizes survey data on whether consumers are accustomed to paper reading or e-reading, and understands the selective behavior of different groups in purchasing books [2]. It is found that in recent years, audio books and e-books have changed the habit of reading paper books. Online bookstores

are rapidly developing with low book prices, unrestricted purchase time and location; the perfection of the express delivery industry allows consumers to get the books they want without leaving their homes; people's reading methods are more diversified and fragmented. And for the "Internet " background, there are constantly suggestions on the marketing model, business philosophy, price strategy, consumer demand and logistics system of the physical bookstore[3] (Li Qing, 2019), so The physical bookstore faces a complex market environment, strong competitors and diverse consumer needs, and needs to actively explore the way out.

At present, the physical bookstore is mainly faced with the problem of analyzing the status quo and exploring the development strategy. Under the background of Internet development, the physical bookstore is facing the situation of bankruptcy or rebirth. Some people are pessimistic about this situation, some scholars believe that physical bookstores face rare opportunities. Scholars have proposed that the development strategy of physical bookstores mainly includes integrating online and offline channels, compound management and creating a bookstore atmosphere. In the existing research, there are few researches on the improvement of the 4V strategy of the physical bookstore based on consumer behavior. The study of improving physical bookstores from 4V strategies lacks a description of consumer behavior, while research based on consumer physical bookstores is less relevant. This paper mainly analyzes consumer behavior through VAR model, and uses Chinese consumer paper book reading rate, e-book reading rate, paper reading volume and national disposable income as independent variables, the physical bookstore sales as a dependent variable. And the relationship between the sales of physical bookstores, to find out the importance of paying attention to consumer needs in the operation of physical bookstores, and to guide them to develop 4V strategies. These are important to fully understand the relationship between consumers and physical bookstores and to promote the development of physical bookstores using 4V strategies

II. LITERATURE REVIEW

A. *Theoretical research on consumer behavior*

Consumer behavior as an independent, systematic applied science emerged after the capitalist industrial revolution, with the rapid development of commodity economy, increasingly acute market problems, and increased competition. In 1968, the first consumer behavior textbook, *Consumer Behavior*, was published. In 1969, the United States (Association for Consumer Research) was formally established. In 1974, the *Journal of Consumer Research (JCR)* was launched. After the 21st century, many kinds of categories have emerged, such as commercial psychology and advertising. Psychology, etc., the further development of consumer behavior.[4]

In recent years, many scholars have done research on consumer behavior in different products and markets. For example, analyze the impact of retail channels on consumer behavior in terms of product type and price[5]. Analyze the development status of physical bookstores and various problems faced by them. Through questionnaires, field visits and other methods to understand the changes in demand, combined with the needs of consumers, from the composite management, scene creation and other aspects of the physical bookstore business model transformation recommendations. [6](Wang Yanyi, Hou Ling 2019). In response to the current changes in the form of knowledge dissemination, the analysis of consumer psychological characteristics and behavioral changes, proposed a response strategy for the book publishing industry [7](Jin Shuyu 2019). By summarizing the trends of mobile commerce, conducting experiments and data analysis to study the digital marketing and online consumer purchase behavior in the Chinese market, and explore the impact of customer loyalty on product communication in e-commerce activities [8](Ajay K. Manrai; 2019).

B. *Research on the marketing strategy of physical bookstores*

Bookstores have a long history in the development of human civilization. The bookstores in the Han Dynasty of China were called Shushu. During the Qing Emperor Qianlong, the name of the bookstore officially entered the cultural stage. With the advent of the Internet era, online bookstores have emerged and developed rapidly. In order to distinguish them from the emerging online bookstores, many traditional bookstores with storefronts are gradually becoming called physical bookstores. The society's understanding of the physical bookstore mainly includes the following aspects: First, the physical bookstore should use the book as the main business product, and second, the physical bookstore should have a specific location and location, pay attention to the operation of the commodity, and carefully arrange the store layout. To sum up, the physical bookstore is a specific cultural facility that has a certain store in a specific geographical location, a book culture product as the main business, a heritage of culture, and a promotion of the quality of members of society.[9],

Collecting relevant documents of physical bookstores in recent years, it is found that the main content is about four aspects. First, the physical bookstore management under the

influence of consumer behavior, such as analyzing the consumer's life form and reading needs through questionnaires [10]. Through the relevant theories of customer satisfaction, bookstore marketing strategies, physical bookstore characteristics and customer group classification, explore various factors affecting the satisfaction of the entity bookstore customer group. [11]; Second, the impact of national policies on the business model and development path of physical bookstores, such as the interpretation of bookstores from the perspective of supply-side structural reform Difficulties and adjustments to supply and demand [12],.analysis of China's "second child" policy and digital publishing, clarifying the development prospects of the children's book publishing market [13]. Changes in reading styles have prompted physical bookstores to change their business models, clearly position and improve location creation, focus on consumer satisfaction, and balance between consumer surplus and spending. [14]; Third, analyze the development of physical bookstores in the context of Internet +, electronic reading and e-commerce, such as: analysis of channels, communication, and communication between company and consumer in the network environment, point out how to make a decision between make a balance produce and demand.[15]; exemplified the combination of popular science books and technology and the conversion of paper books into audio, and the application of VR, emphasizing the new form of collision between media and books. [16], based on online data selection and close links; Fourth, the analysis of product portfolio strategies in the development of physical bookstores under different marketing theories, such as analyzing children's books from the perspective of 4P In the development of the book market [17], the physical bookstore needs to pay attention to the space creation and customer participation from the 4V strategy[18].

C. *Research on 4V marketing strategy theory*

At the end of the 20th century and the beginning of the 21st century, the Internet and mobile communication tools continued to evolve, and the marketing methods were greatly improved and innovated. The communication channels and communication methods between enterprises and consumers were increasingly diversified. On this basis, domestic Scholars proposed the marketing mix theory of 4V (Variation, Versatility, Value, Vibration).[19]

In 2014, Wang Dan used the online bookstore as the comparison object in the marketing strategy of the physical bookstore in the Internet era. It compared and analyzed the advantages and disadvantages of the physical bookstore in the current context, and based on it, from the cultural atmosphere, propaganda planning and sales model. Some aspects have proposed solutions[20]. In 2015, Wang Dandan proposed the "4V Marketing Theory" on the differential combination strategy of differentiated, functionalized service, brand addition and utility maximization of physical bookstores[21]. Although it is slightly duplicated with 4C marketing strategy, this research has market theory. The height is more in line with the new situation faced by the current physical bookstores in China. Therefore, this view has certain reference value for the marketing research of physical bookstores in China. Under the theory of 4V, the study of physical

bookstores mainly starts from expounding problems and measures, such as: directly referring to existing problems, and improving the development of physical bookstores from customer experience, online and offline integration, values and identity [22]; The composite bookstore is the research object, based on the 4v theory, it gives opinions on brand image, composite function, service and added value[23].

III. METHODS

A. model

VAR models are commonly used for time series prediction and the effects of random perturbation terms on variable systems, and are often used to analyze relationships between multiple variables. It has the advantage of retrieving each endogenous variable into a lag term for all endogenous variables to explain the dynamic relationship between the variables.[24] Since most of the variables in real life are not strictly exogenous, it is practical and theoretical to use the VAR model to model all variables as endogenous variables. Based on the above analysis, the VAR model is used to analyze the dynamic relationship between China's digital reading rate, the number of national publications, the number of social public libraries, and the sales revenue of physical bookstores.[25]

The model is expressed as follows:

$$Y_t = C + \delta_1 Y_{(t-1)} + \delta_2 Y_{(t-2)} + \dots + \delta_p Y_{(t-p)} + \varepsilon_t$$

t represents the number of samples. Since the VAR model sets the four variables in the study as endogenous variables, Y_t represents the column vector of the four-dimensional endogenous variable, C is the intercept column vector, $\delta_1, \delta_2, \dots, \delta_t$ is the parameter matrix, and P is the lag order, ε_t is a random error vector.

B. Methodology

Based on China National Reading Survey, China Book Retail Market Report and the National Bureau of Statistics Bulletin. Collect digital reading rates in China from 1998 to 2018, the number of national publications, the number of social public libraries, and the sales of physical bookstores. Use Eviews and ADF tests, cointegration tests and Granger causality tests to verify the relationship between variables.[26]

IV. RESULTS

A. variable

The sales of the physical bookstore were selected as the dependent variable and labeled as sales; the digital reading rate, the number of national publications, and the social public library as independent variables were labeled as DR, NNP, and SPL, respectively.

B. Stationarity test

This paper constructs the VAR model through the 1998-2018 consumer behavior and physical bookstore sales time series data, and explores the relationship between the two. The premise of the VAR model is that the original data must be a

stationary time series or non-stationary time. The sequence satisfies the cointegration relationship. For DPI, DRPBR, PBV and SALES, the stationarity test is carried out. The results are shown in Table 1.

TABLE I. ADF TEST RESULTS

Variable	ADF test value	The critical value at the 1% level	The critical value at the 5% level	The critical value at the 10% level	P-values	Conclusion
SALES	-2.138476	-3.808546	-3.020686	-2.650413	0.2329	Non-stationary
DR	1.181958	-3.808546	-3.020686	-2.650413	0.9967	Non-stationary
NNP	-1.577396	-3.808546	-3.020686	-2.650413	0.4752	Non-stationary
SPL	-4.627508	-3.808546	-3.020686	-2.650413	0.0017	Stationary
D(SALES)	-3.628427	-3.831511	-3.029970	-2.655194	0.0152	Stationary
D(DR)	-2.714018	-3.831511	-3.020686	-2.655194	0.0900	Non-stationary
D>NNP	-3.144491	-3.831511	-3.029970	-2.655194	0.0401	Stationary
D(SPL)	-12.43327	-3.831511	-3.029970	-2.655194	0.0000	Stationary
D(SALES,2)	-5.923982	-3.886751	-3.052169	-2.666593	0.0002	Stationary
D(DR,2)	-4.888808	-3.857386	-3.040391	-2.660551	0.0012	Stationary
D>NNP,2)	-7.152455	-3.857386	-3.040391	-2.660551	0.0000	Stationary
D(SPL,2)	-28.91290	-3.857386	-3.040391	-2.660551	0.0000	Stationary

In Table 1, the ADF value of SPL is -4.627508, the P value is 0.0017 and is significant at the level of 1%, indicating that the SPL is a smooth time series at the 1% level. The ADF values for SALES and NNP are -3.628427 and -3.144491, respectively, and the p values are 0.0152 and 0.0401, respectively, indicating that PBV and SALES are stationary time series at the 5% level. The ADF values of DR is -4.888808, and the p values are 0.0012, indicating that DR is stationary time series at the 10% level.

C. lag order selection and stability test

To construct a VAR model, first determine the optimal lag period of the model. The proper lag period can guarantee the degree of freedom of the model and reflect the dynamic characteristics of the variable. The commonly used methods for determining the hysteresis order are LR (likelihood ratio) test, AIC and SC criteria. The AIC and SC criteria are used to judge the optimal lag order of the model. The test results are shown in Table 2.

TABLE II. LAG ORDER TEST RESULTS

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-349.1547	NA	2.56e+10	35.31547	35.51461	35.35434
1	-276.1406	109.5211*	89152175*	29.61406*	30.60979*	29.80844*

In Table 2, when the lag order is 1st order, the values of AIC and SC are 29.61406* and 30.60979*, respectively, and both of them reach the minimum value. The AIC and SC guidelines stipulate that the lag order that makes the AIC and SC values reach the minimum value at the same time is the optimal lag order of the model. Therefore, the optimal lag order of the model is judged as 1 order.

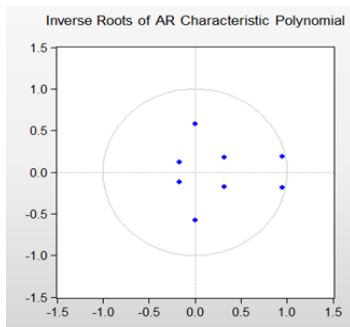
If the reciprocal of all root models of the model is less than 1, that is, the reciprocal of all root modes is less than 1 or both

within the unit circle, the established model is stable, so the causality test and variance decomposition test performed in the model Both are valid; on the contrary, the model is unstable. The reciprocal distribution of the unit root is shown in Figure 1 and Table 3. The reciprocal of all root modes is less than 1. The established VAR model is stable.

TABLE III. MODEL STABILITY TEST

Root	Modulus
0.954722 - 0.183498i	0.972197
0.954722 + 0.183498i	0.972197
0.003162 - 0.575074i	0.575083
0.003162 + 0.575074i	0.575083
0.323992 - 0.172669i	0.367131
0.323992 + 0.172669i	0.367131
-0.171114 - 0.117177i	0.207390
-0.171114 + 0.117177i	0.207390

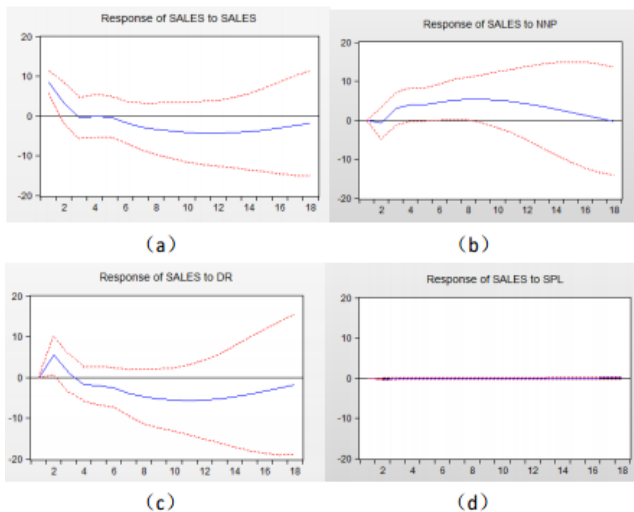
Fig. 1. Model stability test



D. Impulse response

The impulse response function expresses the reaction of endogenous variables to changes in one's own or other endogenous variables, and can visually characterize the dynamic interactions and effects between variables. This part uses Eviews software to obtain the impulse response function of sales, dpi, dr, pbr, pbv to sales, as shown in Figure 2.

Fig. 2. Graphical output of impulse response function

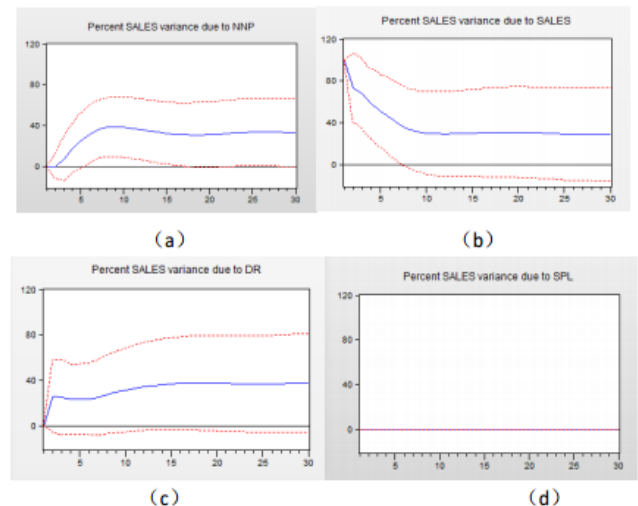


As can be seen from Fig. 2, the solid line portion represents the time path of the impulse response function of 1 unit pulse shock, and the dotted line on both sides represents the confidence interval of 2 standard deviations. Figure 2(a) shows the time path of the response function of sales to itself. The pulse effect decreases in the first 1-3 period, and the 3-5 period is stable. After the 5-11 period declines, it starts to rise from the 11th stage. 0, its response path is basically negative. It shows that the increase in current sales of physical bookstores will lead to a decrease in sales of physical bookstores in subsequent periods, and the elastic coefficient of change is unstable. Figure 2(b) shows the impact of NNP on SALES. The response path of SALES rises first, and the 9th phase begins to decline, and is basically stable at zero. Explain that the increase in the number of national publications can lead to an increase in sales of physical bookstores. Figure 2(c) shows the impact of DR on SALES. Although there is a clear upward trend in 1-2, the trend is decreasing in the 2-12 period; after 16 periods, it tends to 0, and the response path is always negative, rising and falling. The larger range indicates that the increase in digital reading rate is back to the construction of physical bookstore sales. Figure 2(d) shows the impact of SPL on SALES. Although the response path is basically positive, the impact of pulses in each period is basically zero, indicating that the increase or decrease of social public libraries has little impact on the sales of physical bookstores.

E. Variance Decomposition

Understanding the characteristics of the prediction error is helpful to reveal the relationship between the variables in the system. The variance decomposition can give the relatively important information of the random interference term. In this paper, we use Eviews software to obtain the output of the variance decomposition graphs of SALES, DR, NNP and SPL four time series, as shown in Figure 3.

Fig. 3. Variance Decomposition results



As can be seen from Figure 3, the solid line in the figure is the time path of the variance decomposition. Figure 3(a) shows the variance decomposition time path of NNP to SALES. The path is always positive and tends to be flat from the 13th period, indicating that the number of national publications

contributes to the sales of physical bookstores and continues to increase at 35%. about. Figure 3(b) shows the time path of SALES's own variance decomposition, and its time path is always positive and decreasing, which indicates that the current physical bookstore sales contribution to the subsequent sales is getting smaller and smaller, since the 10th period. It is stable at around 32%. Figure 3(c) shows the variance decomposition time path of DR to SALES, and its contribution rate to physical bookstore sales is increasing, maintaining at around 33%, indicating that the contribution of digital reading to physical bookstore sales is also large; Background Because of the emergence of digital reading, physical bookstores have developed online channels, improved business models, and precise positioning. Figure 3(d) shows the variance decomposition time path of SPL to SALES, which is basically the same as 0 and remains unchanged, indicating that the contribution of the increase of social public libraries to the physical bookstore sales is stable and not significant.

F. Cointegration test

This part uses the Johansen cointegration test. The results are shown in Table 4. The trace statistic corresponds to the P value = 0.0036 < 0.05, that is, at the 5% significance level, the variable LNURG and There are at least two cointegration relations between LNPGDP, that is, the long-term equilibrium relationship between physical bookstore sales and Digital reading rate, number of social public libraries, national publications.

TABLE IV. JOHANSEN COINTEGRATION TEST

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.998712	173.4436	47.85613	0.0000
At most 1 *	0.754682	47.01144	29.79707	0.0002
At most 2 *	0.612887	20.31268	15.49471	0.0087
At most 3	0.113123	2.280926	3.841466	0.1310

The Granger causality test of SALES and DR, NNP, SPL, the results are shown in Table 5. As can be seen from Table 5, P < 0.05 for DR, NNP, SPL, indicating that the digital reading rate, the number of social public libraries and national publications are all Granger reasons for physical bookstore sales.

V. DISCUSSION AND CONCLUSION

The above studies show that the number of national publications is closely related to the social public libraries in the operation and digitalization of physical bookstores. In particular, changes in digital reading rates have had a major impact on the sales of physical bookstores. Moreover, when physical bookstore operators expand their markets, they can reduce their focus on social public libraries, because consumers' purchases in physical bookstores do not change dramatically because of the increase in social public libraries, so it does not show up. A market that affects physical bookstores. So far, the hidden factors about the relationship between consumer behavior and physical bookstores are not

fully understood. In this article, we strive to expand and understand the factors related to consumer behavior, and by discussing the results of relevant analysis, it is necessary to find research and a more comprehensive understanding and new sales model, and in practice, it needs to be implemented. Therefore, physical bookstores need to be improved from the following aspects:

On the one hand, the physical bookstore should use the advantages that digital reading does not have, and establish a loyal customer base. It is necessary to grasp the direction of market consumption, clarify its own positioning and consumer groups, mainly for business and precision marketing, and pay attention to consumer feedback (Variation).

On the other hand, enhance the consumer's goodwill towards the company through book drift and shared reading activities. From the outside, such as: through aesthetics, innovative bookstore decoration, layout and trademark combination, to create a visual experience of consumption; combined with information technology (value).

Besides, it is possible to launch a scientific book integrated with VR in the store; it can consume an information management system that establishes a book management and communication culture as the core operation concept, and promotes products such as cafes, leisure areas, and children's areas. And through the management and training of employees, to create a quality service team (Versatility).

Finally, the management of physical bookstores is also related to the number of national publications. Therefore, we must pay attention to the construction of social platforms, grasp the hot spots of consumers and the real-time development of national culture. In addition, it resonates with consumers through advertising and corporate philosophy, and increases consumer trust by establishing a corporate social image (Vibmtion) .

Of course, my paper has limitations in the research process. Since the required data is longer than the current interval, the 1998 and 2000 digital reading rate data comes from reading other people's articles and related records. The selection frequency is the highest, lack of authoritative support, and may slightly deviate from the actual situation.

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