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The Influence of Subjective Norm and Perceived Behavioral Control on Green Purchase Intention of Chinese college students ——Empirical Research based on Multiple Regression and VAR models

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SUMMARY: *In this paper, we will focus on the impact and linear relationship of two variables, Subjective Norm and Perceived Behavioral Control, on Green Purchase Intention. We conducted a random sampling of 349 participants in China and utilized statistical analysis using software such as SPSS. We obtained results from reliability tests, correlation coefficients, and regression analyses. Empirical analysis confirmed significant positive effects of green purchase intention on Subjective Norm and Perceived Behavioral Control. To further explore potential influencing factors, we introduced Green Purchase Intention as an explanatory variable for Green Perceived Value in the basic model, confirming a positive impact of GPI on GPV. Additionally, we constructed a VAR model for four variables and conducted ADF tests and unit root tests, ultimately deriving impulse response results. Thus, we revealed the dynamic impacts of SN and PBC on GPI through the pulse changes in different variables.*

KEYWORDS: *Green purchase intention; Subjective norm; Perceived behavioral control; Green perceived value; Chinese college students; Multiple regression; Vector autoregression (VAR)*

1 Introduction

1.1 Background

In recent years, my country's consumption has maintained steady and rapid growth, its fundamental role in economic development has been significantly enhanced, and its impact on the ecological environment has become increasingly apparent. China's consumption characteristics have undergone significant changes: from meeting basic needs to pursuing growth consumption, and from material consumption to environmentally friendly consumption.

The Chinese government attaches great importance to green consumption and has issued 101 policy documents related to green life, 26 of which mainly include notices, opinions, plans, etc. to promote green consumption. There are also 75 related documents, which mainly implement specific measures and initiatives to promote national decision-making. China's institutional framework for promoting green consumption has initially taken shape.

On the public front, there has been a noticeable increase in public environmental awareness and participation, along with growing demands and expectations for a better

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quality of life, forming the social foundation for green consumption. People have become aware of the role of consumption in sustainable development, leading to a strengthening willingness to engage in green consumption.

Many consumers are increasingly interested in purchasing green products or services and believe that green consumption is an effective way to reduce environmental impact. (Awan and Raza, 2012)

1.2 Problem statement

Although an increasing number of studies indicate that consumers are increasingly willing to actively promote green consumption by purchasing green products, it is worth noting that some research emphasizes the impact of subjective norms and perceived behavioral control on green purchasing intentions. Furthermore, there is room for further research to determine whether there is a real impact.

College students, as a subset of the public, are important in this context. Their behaviors, intentions, and influencing factors can help explore both current influences and future exploration spaces in green consumption.

To investigate specific influencing factors, many previous studies have used empirical analysis as a method to examine consumer behavior. Building upon a multi-factor model analysis, introducing VAR (Vector Autoregression) analysis can provide a deeper understanding of the mutual effects among variables.

1.3 Research questions

Based on the background, this paper proposes the following research questions:

RQ1: Will subjective norms (SN) and perceived behavioral control (PBC) influence the green purchase intention (GPI) of Chinese college students?

RQ2: Does the willingness to engage in green purchases intention (GPI) affect the green perceived value (GPV) of Chinese college students?

RQ3: Do subjective norms (SN) and perceived behavioral control (PBC) dynamically influence the green purchase intention (GPI) of Chinese college students?

1.4 Research objectives

Based on the background and questions, the aims of this study are to:

RO1: Examine the impact of subjective norms (SN) and perceived behavioral control (PBC) on Chinese college students' green purchase intention;

RO2: Examine the green purchase intention (GPI) on the green perceived value (GPV) of Chinese college students;

RO3: Examine the dynamic impact of subjective norms (SN) and perceived behavioral control (PBC) on Chinese college students' green purchase intention.

1.5 Significance of the research

The main significance of this study highlights its theoretical and experimental contributions to understanding the influencing factors that influence green purchase intention.

The theoretical significance lies in its potential to contribute new empirical analysis results. Furthermore, this paper complements existing theory by identifying influencing factors that drive green purchase intention. The subjective norm (SN) variable is rarely introduced in the traditional research process, and there is a lack of quantitative analysis of green consumption through the integration of subjective norms and green perceived behavioral control (PBC).

This article may be helpful to the management of institutions related to green consumption, emerging green market transactions, local governments, and environmental organizations, and will be helpful in exploring the causes of impacts and formulating investments. In addition, looking at the existing research on China, there are many research documents on the impact of VAR models on traditional consumption, but there are few studies related to green consumption. China's green consumption market is not very mature, so the analysis of influencing factors is still in progress. In contrast, this article can provide certain important information for many developing countries in order to transform the current immature consumer market into a market that can promote sustainable development in the future.

1.6 Definition of terms

1.6.1 Green Procurement Intention (GPI)

Chen and Chang (2012) believe that green purchase intention is the possibility that consumers want to purchase environmentally friendly products.(Chen, Y. S., & Chang, C. H. ,2012).

1.6.2 Subjective Norm (SN)

Criteria that require people to try to understand which information is relevant to a particular individual are designed to respect these potential differences in normatively important preferences. (May, T., 2002)

1.6.3 Perceived Behavioral Control (PBC)

Perceived Behavioral Control (PBC) encompasses perceptions of control, confidence, and difficulty. Alternatively, it can be viewed as two factors: self-efficacy measured by perceived difficulty and confidence, or simply perception.(Kraft, P., Rise, J., Sutton, S., & Røysamb, E. ,2005)

1.6.4 Green Perceived Value (GPV)

Perceived value is the overall judgment a customer makes about a product, taking into account what they receive in relation to what they expected. In the realm of environmentally friendly products, this is known as green perceived value. It reflects the benefits consumers derive from such products, addressing their environmental concerns and sustainability expectations. This perception can drive positive actions like advocating for green products or intending to purchase them.(Román-Augusto, J. A., Garrido-Lecca-Vera, C., Lodeiros-Zubiria, M. L., & Mauricio-Andia, M., 2022)

2 Literature Review

2.1 Introduction

In this chapter, we deeply explore the research on green purchase intention in China, identify the gaps in any existing research, and lay the foundation for the empirical analysis of this article. The background proposed variables GPI, SN, PBC and GPV are defined and explained. The use of the model also finds corresponding theoretical support from prior research.

2.2 Dependent variable

Green Purchasing Intention (GPI)

The study by Chan, R. Y. (2001) examined how cultural and psychological factors influence green purchasing behavior among Chinese consumers. A survey conducted in two major Chinese cities validated a conceptual model. Results showed that individualism, collectivism, ecological impact, and ecological knowledge affect attitudes toward green purchases. These attitudes, in turn, mediate the relationship between green purchase intentions and actual behavior.

2.3 Independent variables

Subjective Norm (SN)

Ajzen, I. (2002)emphasizes the importance of asking multiple questions that strongly reflect subjective norms to obtain a direct measure. However, responses may show low variability because individuals perceive important others as endorsing desirable behaviors and disapproving of undesirable ones. Additionally, Ajzen, I. (2002)suggests including items that capture descriptive norms to assess whether significant others engage in similar behavior.

Perceived Behavioral Control (PBC)

Perceived control refers to the extent to which people believe that the performance of a behavior is under their voluntary control. Perceived difficulty refers to whether people think a certain behavior is easy or difficult to perform. Research has found that it is possible that execution has a greater impact on perceived control than manipulation of perceived difficulty, or that manipulation has a greater impact on perceived difficulty than perceived control.(Yzer, M.,2012).

2.4 Hypotheses development

The relationship between subjective norms, perceived behavioral control, and salient beliefs regarding behavior, norms, and control is recognized, yet the exact nature of these associations remains ambiguous(Ajzen, I. ,1991).

Subjective norms have a positive impact on consumers' purchase intention (Bong Ko and Jin, 2017).

Chauhan Vinay and Bhagat Rohit(2018)examined how subjective norms and perceived behavioral control affect consumers' preferences for environmentally friendly products. The growing awareness of environmental issues has prompted substantial lifestyle shifts among consumers. Using a structured questionnaire, the researchers demonstrated that subjective norms and perceived behavioral control play a constructive role in shaping consumers' decisions to purchase green products.Based on the above prior research, we put forward hypothesis 1.

H1:There is a significant positive impact between SN,PBCand GPI.

Janine Fleith de Medeiros(2016) conducted an experimental study to investigate the correlation between consumers' perceived value of green products and their purchase intention, presenting experimental findings across various purchase scenarios. Additionally, the study elucidates the relationship between consumers' perceived value of green products and price elasticity.

H2:GPI has a significant positive impact on GPV.

In social psychology, many models aimed at explaining behavior postulate interaction effects among explanatory latent variables. In recent years, there have been numerous advancements in estimating interactions between latent variables within structural equation modeling. However, there are few applications using real data from theory-driven studies.(Yang-Wallentin, F., Schmidt, P., Davidov, E., & Bamberg, S. ,2004)

Xiaolin Li, You Li, Jiali Cai, Yunzhong Cao & Liangqiang Li(2021) built a VAR model based on the annual data of China's green finance and green economy from 2004 to 2017 to

empirically analyze the dynamic relationship between green economy and green finance. Empirical results show that increasing green financial investment has a positive impact on the development of the green economy.

H3:SN and PBC have a significant dynamic impact on GPI.

2.5 Chapter summary

Based on a systematic literature review, relevant definitions and hypotheses are illustrated. Through analysis of previous research, we know that subjective norms, perceived behavioral control, and green purchasing are related. However, there is currently a lack of in-depth demonstration and analysis. For quantitative analysis of variables, more dimensions need to be explored.

Based on the research background, we propose three hypotheses to investigate the relationships and influence paths among SN, PBC and GPI.

3 Research Methodology

3.1 Introduction

This article uses empirical research methods to propose three hypotheses for verification. The data will be collected from Chinese college students of different genders, educational levels, and age groups, using non-probability sampling for data statistics.

This chapter uses empirical research to construct multiple regression models and VAR models to explore the relationship between these variables.

3.2 Research framework

Based on the literature and hypotheses, the framework of this study is as follows:

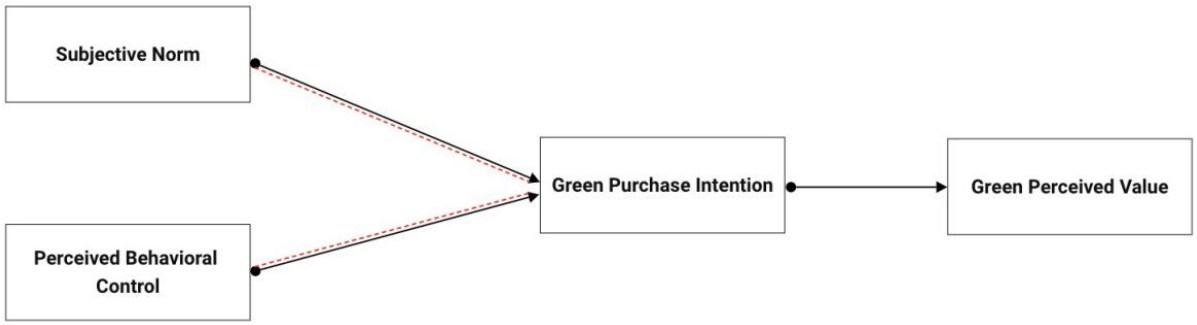

Figure 1: The Research Framework

3.3 Research design

This study follows the positivist model and uses quantitative methods to test, hypothesise and test the relationship between variables by exploring relevant theories, and conduct further research and exploration on whether there is a dynamic influence relationship between variables.

First, basic statistics are performed on the sample to obtain basic statistics. Secondly, construct a regression model for important factors, obtain regression analysis results, and analyze and study the results.

Finally, a vector autoregressive model is constructed to verify the dynamic relationship

between the main variables and obtain the impulse response between the variables.

3.4 Population and sampling

The population of this study is targeted at college students of different ages and educational levels in China, forming a characteristic population group. To test the research questions, random sampling was conducted, and the sample was prepared and extracted. This study used 16 items in the questionnaire as indicators, and a total of 394 respondents filled out the questionnaire as a sample.

3.5 Instrumentation

A structured questionnaire was conducted to collect data from the respondents as a sample, which in this study used a 7-point scale to measure the level of agreement of the respondents. Each item is rated by the respondent from “1” (strongly disagree) to “7” (strongly agree). The questionnaire contains 16 items in total and measures 4 variables.

Ethical considerations were highlighted in the preface to the questionnaire, assuring respondents of confidentiality and anonymity of data in any reported or published findings. This study used nominal scales, for example, women were coded as “1” and men as “2”, as were age, education, etc.

3.6 Chapter summary

In this chapter, we provide a comprehensive overview of the origin, composition and circumstances of the sample. The composition of the main variables and the research framework are explained. Secondly, the preparation work before the empirical research and the methods used for data collection are clearly explained, and the basic research design is dismantled.

Variables	Items
Green Purchase Intention (Dependent variable) (Y) Adapted from Kim et al. (2013); & Akbar et al. (2014)(5 items) Kim, Y.J., Njite, D., Hancer, M., 2013. Anticipated emotion in consumers' intentions to select eco-friendly restaurants: augmenting the theory of planned behavior. Int. J. Hosp. Manag. 34, 255e262. Akbar, W., Hassan, S., Khurshid, SH., Niaz, M & Rizwan, M. (2014), 'Antecedents Affecting Customer's Purchase Intentions towards Green Products', Journal of Sociological Research, 5(1), 273-289.	GPI1: I will purchase green products for personal use.
	GPI2: I am willing to purchase green products for personal use.
	GPI3: I will make an effort to purchase green products.
	GPI4: My willingness to buy green products is high.
	GPI5: I have a high intention to buy green products.
Subjective Norm (X1) Adapted from Chan and Lau (2002) (3 items) Chan, R. Y., & Lau, L. B. (2002). Explaining green purchasing behavior: A cross-cultural study on American and Chinese consumers. Journal of international consumer marketing, 14(2-3), 9-40.	SN1: Most people who are important to me would want me to purchase eco-friendly products for personal use
	SN2: Most people who are important to me would think I should purchase green products for personal use
	SN3: environmentally Most people who are important to me think I should be an -responsible consumer.
Perceived Behavioral Control (X2) Adapted from Kim and Han (2010) (3 items) Kim, Y., & Han, H. (2010). Intention to pay conventional-hotel prices at a green hotel–a modification of the theory of planned behavior. Journal of Sustainable Tourism, 18(8), 997-1014.	PBC1: Whether or not I buy green product at place of conventional non-green product is completely up to me.
	PBC2: I have resources, time and opportunities to buy green product.
	PBC3: I am confident that if I want, I can buy green product at place of conventional non-green product.
Green Perceived Value (X5) Adapted from Chaudhuri, A. (1997) (5 items) Chaudhuri, A. (1997). Consumption emotion and perceived risk: A macro-analytic approach. *Journal of Business Research*, *39*(2), 81-92.	GPV1: Green products give me extra value.
	GPV2: Green products have high value.
	GPV3: Green products give me more benefits than other products.
	GPV4: Green products environmental functions provide good value to me.
	GPV5: Green products have more environmental concern than non-green products.

Figure 2: Items and Resources of Questionnaire

4 Data Analysis

4.1 Introduction

This chapter is dedicated to model construction and result analysis, using a variety of quantitative methods to verify the hypothesized relationships. The theoretical models and research hypotheses obtained from prior studies are used to build the basic equation model.

First, in the data cleaning phase, a comprehensive screening and cleaning process was conducted. This is done to ensure the analyzability of the data and the prerequisites for quantitative processing. Finally, 394 valid data points were obtained for data analysis.

Therefore, in this study, N=394, and the statistical information of the population sample is shown in Table 1. In addition, in the data analysis stage, econometric models are used to analyze valid data. The reliability of the data was tested using Cronbach's α coefficient, the result of the reliability test. In addition, basic statistics are calculated, and kurtosis and skewness are used to determine whether the data sample obeys the normality test. Regression analysis is used to construct a basic model by examining the relationship between variables. The calculation results of the VAR model and pulse analysis help to obtain objective impact results.

Table 1: Demographic profile of respondents

Standard Attributes	Nominal scale	Count	Percent
Gender	1-Female	278	70.56%
	2- Male	116	29.44%
Age	18 and below	5	1.27%
	19-23	344	87.31%
	24-28	22	5.58%
	29-32	6	1.52%
	33 and Above	17	4.31%
Education Level	Junior College and Pre-Uni	30	7.61%
	Degree	335	85.03%
	Masters	14	3.55%
	PhD	15	3.81%

4.2 Reliability test

In order to ensure the reliability of the quantitative research, this study conducted reliability tests, including item analysis and reliability. SPSS was used to analyze the sample data and the Cronbach coefficient results were obtained to verify that the collected data was trustworthy.

Reliability testing utilized the Alpha (Cronbach) model to assess internal consistency. Generally, Cronbach's coefficient values equal to or greater than 0.70 are considered to indicate higher reliability, with coefficient values falling in the range of 0.70 to 0.98. This analysis helps confirm the reliability and accuracy of measurement standards.

Cronbach’s Alpha values were performed on all variables (GPI, SN, PBC, GPV), and the results are shown in Table 2. The Cronbach’s Alpha values of GPI, SN, PBC, and GPV are all greater than 0.7, and the Cronbach value of all variables as a whole is 0.955, ranging from 0.70-0.98. So far, all four variables in this study and a total of 16 items have high reliability as a tool to measure green purchase intention and behavior.

Table 2: Reliability Statistics

	Cronbach's Alpha	**N of Items**
GPI	0.939	5
SN	0.937	3
PBC	0.814	3
GPV	0.905	5
GPI, SN, PBC, GPV	0.955	16

4.3 Normality test

Before conducting modeling analysis, it is necessary to verify whether the data obeys a normal distribution. The calculation results of basic statistics are shown in Table 3. The kurtosis value of each sample group data is between -7 and 7, and the skewness is between -2 and 2. The results for our sample, both skewness and kurtosis are between -1 and 1. Although the kurtosis of M_SN and M_GPV is very small, 0.068 and 0.04, their skewness is still very obvious to the left, and the overall results of the four samples have obvious peaks and left skew.

We calculated the Q-Qplot results of the variables as shown in Figure 3. The variables are basically around the trend line, but the tails of the M_GPI, M_SN, and M_PBC samples have obvious deviations. There are questions about whether the overall sample data obeys the normal distribution(Marden, J. I. ,2004). The results appear to be a skewed distribution.

Table 3: Statistics

		M_GPI	M_SN	M_PBC	M_GPV
Observations	Valid	394	394	394	394
	Miss	0	0	0	0
Mean		5.623350	5.155668	5.484772	5.449239
Median		5.800000	5.600000	5.666667	5.000000
Std.Dev		1.290349	1.430520	1.227993	1.163356
Skewness		-0.882	-0.639	-0.802	-0.545
Std. Error of Skewness		0.123	0.123	0.123	0.123
Kurtosis		0.504	0.068	0.837	0.040
Std. Error of Kurtosis		0.245	0.245	0.245	0.245
Minimum		1.000000	1.000000	1.000000	1.000000
Maximum		7.000000	7.000000	7.000000	7.000000

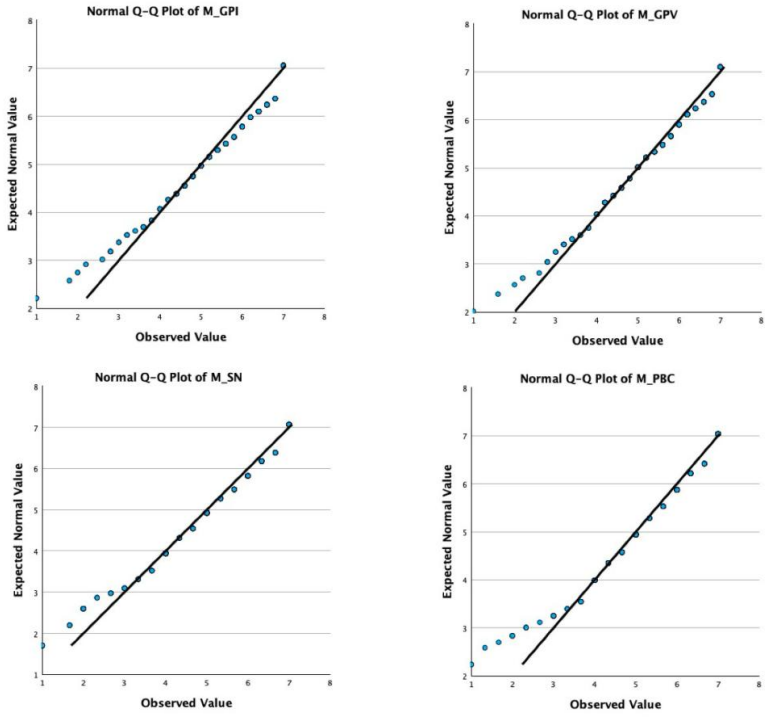

Figure 3: The Normal Q-Q Plot of variables

4.4 Pearson correlation

In this study, we used Pearson correlation coefficient calculation to examine the correlation between variables. Determine the strength of the correlation between two variables by observing the results of the correlation coefficient(Coen, I.,2009).

The calculation results are shown in Table 4. The correlation coefficient between SN and GPI is 0.741, the correlation coefficient between PBC and GPI is 0.771, and the correlation coefficient between GPV and GPI is 0.597, all of which are positive correlations. In particular, the correlation coefficient values of SN, PBC and GPI are greater than 0.7, showing high correlation. And the P-value of the calculated correlation coefficient result is less than 0.00, which is statistically significant.

Table 4: Correlations

		M_GPI	**M_SN**	**M_PBC**	**M_GPV**
M_GPI	Pearson Correlation	1	0.741**	0.771**	0.597**
	Sig. (2-tailed)		<.001	<.001	<.001
	N	394	394	394	394
M_SN	Pearson Correlation	0.741**	1	0.759**	0.613**
	Sig. (2-tailed)	<.001		<.001	<.001
	N	394	394	394	394
M_PBC	Pearson Correlation	0.771**	0.759**	1	.662**
	Sig. (2-tailed)	<.001	<.001		<.001
	N	394	394	394	394
M_GPV	Pearson Correlation	0.597**	0.613**	0.662**	1
	Sig. (2-tailed)	<.001	<.001	<.001	
	N	394	394	394	394

4.5 Multiple linear regression

4.5.1 Construct regression analysis of GPI, SN, and PBC

In order to examine the relationship between variables, a multiple linear regression analysis was established. Construct equations, test the relationship between GPI, SN, and PBC, and study the results to draw the first hypothesis.

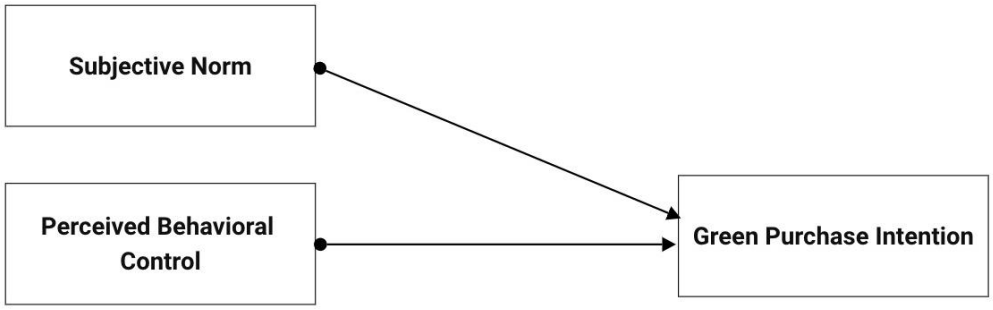

Figure 4: The framework of H1

Construct the multiple regression equation (Model 1):

$$M\_GPI = C(1) + C(2)*M\_SN + C(3)*M\_PBC+Residual$$

Substitution coefficient:

$$M\_GPI = 1.078 + 0.3324 * M\_SN + 0.5162 * M\_PBC$$

The results of the model are analyzed: the independent variables include SN and PBC, and the dependent variable is GPI. The overall results of the model are shown in Table 5. The R Square value is 0.652, and the adjusted R Square value is 0.650. The explanatory power of the model is good. Changes in the dependent variable "GPI" can be explained by the independent variables "SN" and "PBC" and form a linear relationship.

The fitting results are shown in Table 7. The data shows that the regression model predicts the dependent variable well and the estimated value of each coefficient corresponds to Sig. (p) <0.001, indicating that the estimated coefficient is statistically significant. And the slope of M_PBC is higher(Figure 5), reaching 0.516, although the value of the intercept term is larger, reaching 1.078, and Std. Error is higher than other factors, reaching 0.177, but the p value is less than 0.001, which is still significant.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.807a	0.652	0.650	0.7632
a Predictors: (Constant), M_SN, M_PBC b. Dependent Variable: M_GPI				

Table 6: ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	426.603	2	213.301	366.207	<0.001b
	Residual	227.743	391	0.582		
	Total	654.345	393			
a Predictors: (Constant), M_SN, M_PBC b. Dependent Variable: M_GPI						

Table 7: Coefficientsa

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	
1	(Constant)	1.078	0.177		6.102	<.001
	M_SN	0.332	0.041	0.369	8.046	<.001
	M_PBC	0.516	0.048	0.491	10.726	<.001
a. Dependent Variable: M_GPI						

According to the results of the empirical analysis, green purchase intention has a significant positive linear relationship with subjective norms and perceived behavioral control. The test results support the hypothesis of 1: subjective norms and perceived behavior affect green purchase intention.

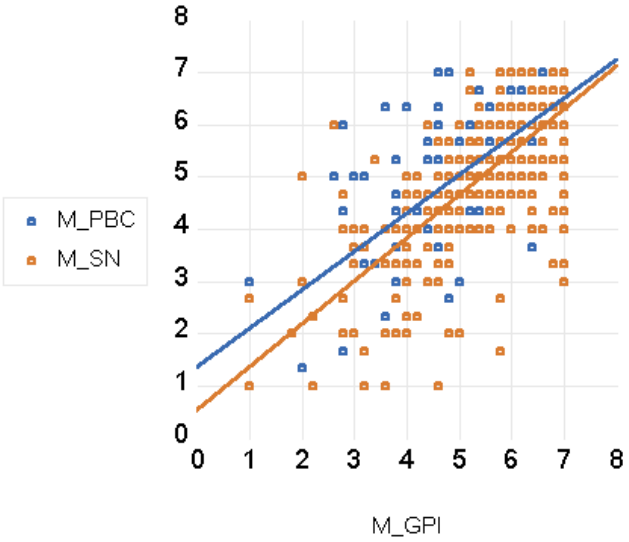

Figure 5: Regression line between dependent variable and independent variable

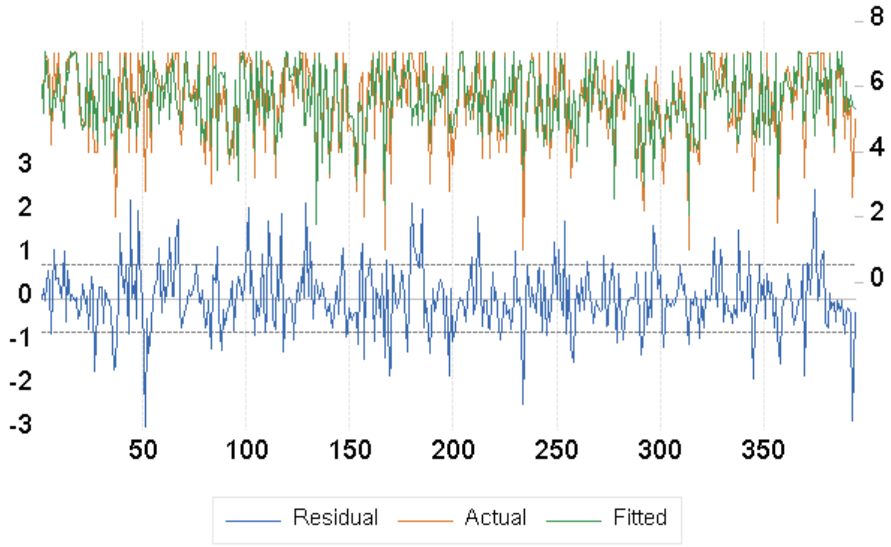

Figure 6: Residual distribution of model 1 regression

4.5.2 Construct regression analysis of GPV and GPI

Through the results of correlation analysis, we can get that the correlation coefficient between GPV and GPI is 0.597. Although it does not exceed 0.7, it is still a relatively high positive correlation. Therefore, in order to explore whether green purchase intention will affect green perceived value, this chapter constructs a unitary Linear regression equation tests the linear relationship between GPV and GPV, and confirms the second hypothesis based on quantitative analysis results.

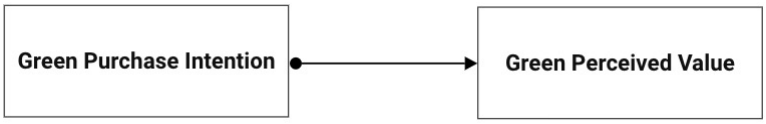

Figure 7: The framework of H2

Construct a univariate regression equation (Model 2):

$$M\_GPV = C(1) + C(2)*M\_GPI+Residual$$

Substitution coefficient:

$$M\_GPV = 2.420 + 0.539*M\_GPI$$

Analyze the results of the model: the independent variable is GPI, and the dependent variable is GPV. The results of the model are shown in Table 8. Although the R Square value has been reduced to 0.357, it still has a certain explanatory power. The change of the dependent variable "GPV" is affected by the independent variable "GPI".

According to the fitting results, the coefficient of the GPV variable is 0.539, and Sig. (p) < 0.001, indicating that the coefficient estimate is statistically significant. And the slope of M_PBC is relatively high, reaching 0.539, showing a positive linear relationship.In addition, it can be seen from Figures 8 and 9 that the distribution of the residuals belongs to the normal distribution, which also supports the validity of the model(Marden, J. I. ,2004).

Table 8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	0.597a	0.357	0.355	0.9341
a Predictors: (Constant), M_GPI b. Dependent Variable: M_GPV				

Table 9: ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	189.858	1	189.858	217.599	<0.001b
	Residual	342.026	391	0.873		
	Total	531.885	393			
a Predictors: (Constant), M_GPI b. Dependent Variable: M_GPV						

Table 10: Coefficientsa

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	
2	(Constant)	2.420	0.211		11.488	<.001
	M_GPI	0.539	0.037	0.597	14.751	<.001
a. Dependent Variable: M_GPI						

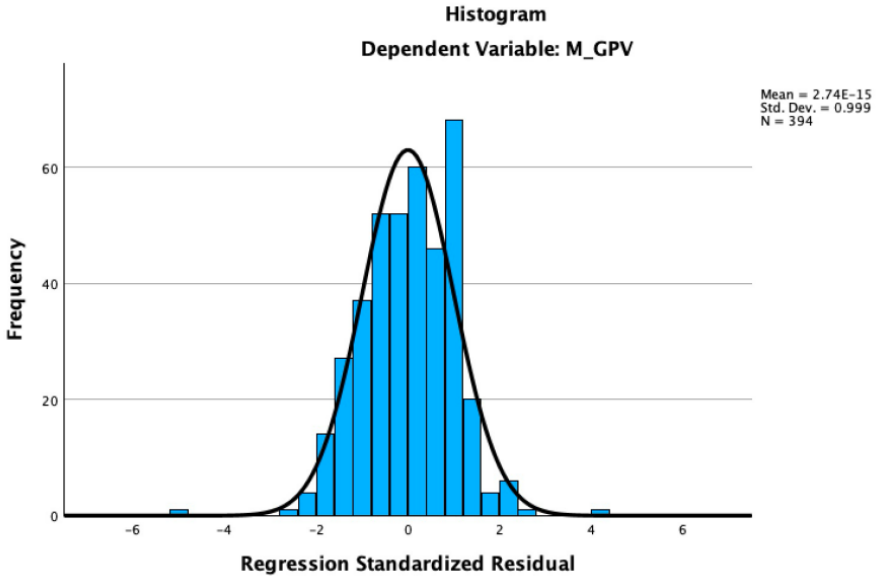

Figure 8: Residual distribution of model 2 regression

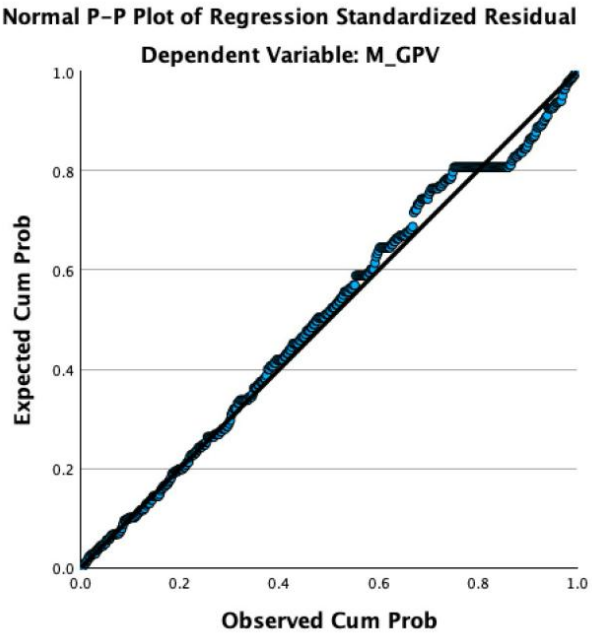

Figure 9: Normal P-P plot of model 2 regression standardized residual

4.5.3 Construct VAR model (Vector Autoregressive Model) of GPI, SN, and PBC

Structural equation modeling is the preferred method for the estimation of the interaction effect (Yang-Wallentin, F., Schmidt, P., Davidov, E., & Bamberg, S. ,2004).

Before building the model, we assume that the sequence numbers for obtaining sample data obey the time sequence. During this sampling process, the sequence numbers are also arranged according to the students' sampling results, with the concept of time recursion, so the data samples Basically it can obey the chi-square distribution and is random data. Then we regard the overall sample as the opinions of the main body of college students. On the basis of random data, according to the order of time, we can obtain the time series data of the opinions

of college students.

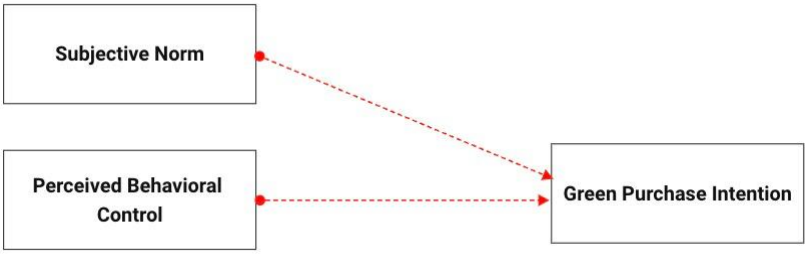

Figure 10: The framework of H3

VAR model (model 3):

D(M_GPI) = A(1,1)(B(1,1)*M_GPI(-1) + B(1,2)*M_SN(-1) + B(1,3)*M_PBC(-1) + B(1,4)) + C(1,1)*D(M_GPI(-1)) + C(1,2)*D(M_GPI(-2)) + C(1,3)*D (M_SN(-1)) + C(1,4)*D(M_SN(-2)) + C(1,5)*D(M_PBC(-1)) + C(1,6)*D(M_PBC (-2)) + C(1,7)*

Substitution coefficient:

D(M_GPI) = - 0.0813(M_GPI(-1) + 1.957*M_SN(-1) - 3.109*M_PBC(-1) + 1.351) - 0.515*D(M_GPI(-1)) - 0.182*D(M_GPI (-2)) + 0.112*D(M_SN(-1)) + 0.062*D(M_SN(-2)) - 0.344*D(M_PBC(-1)) - 0.257*D(M_PBC(-2)) - 0.008*

Since the variables in the VAR model are required to be stationary data, in order to avoid the occurrence of "pseudo-regression" phenomenon, first, each sequence entering the model is tested for stationarity. The ADF test in statistical testing is usually used.This method ensures that each variable in the model is stationary (Lütkepohl, H., 2009).The test results are shown in Table 11,all results are smooth.

Table 11: ADF Test

variable	ADF statistics	5% critical value	10% critical value	P value	result
M_GPI	-19.303	-2.869	-2.571	0.000	smooth
M_SN	-19.828	-2.869	-2.571	0.000	smooth
M_PBC	-20.714	-2.869	-2.571	0.000	smooth

The stationarity of the model also needs to be tested using the unit circle, as shown in the Figure11. When all characteristic roots of the model are located within the unit circle, the model is said to be stable. As can be seen from Figure 11, the characteristic roots of this model are all located within the unit circle, which shows that the model with second order lag has a higher fitting degree and is relatively stable.(Dong, K., 2021).

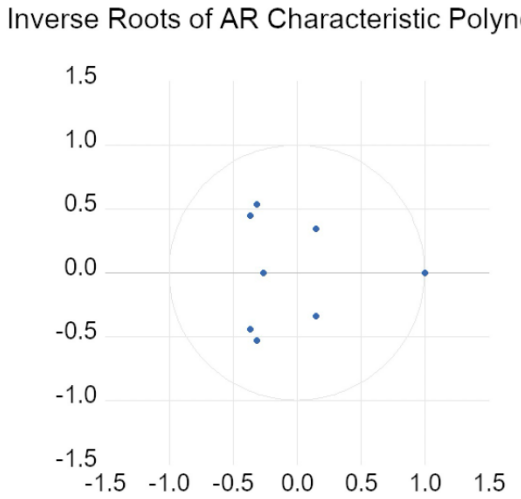

Figure 11: Inverse roots of AR characteristic polynomial

Table 12: Model Summary

Model	R Square	Adjusted R Square	Sum sq.resids	F-statistic
3	0.367	0.356	806.097	31.758
a Predictors: (Constant), M_SN, M_PBC b. Dependent Variable: M_GPI				

Table 13: Cointegrating Eq Coefficientsa

Model		Coefficients
3	M_GPI(-1)	1
	M_SN(-1)	1.957
	M_PBC(-1)	-3.109
	C	1.351

Table 14: Error Correction Coefficientsa

Model		Coefficients
3	CointEq1	-0.0813
	D(M_GPI(-1))	-0.5148
	D(M_GPI(-2))	-0.1820
	D(M_SN(-1))	0.1124
	D(M_SN(-2))	0.0628
	D(M_PBC(-1))	-0.3440
	D(M_PBC(-2))	-0.2572
	C	-0.0089

The essence of impulse response analysis is to study the dynamic impact of shocks on a certain variable at different stages on the premise that the model is stable. Therefore, by plotting the impulse response diagram, the dynamic relationship between SN and PBC and GPI needs to be analyzed (Dong, K., 2021).

In the Figure12, when a positive impact is given to the SN variable, the dependent variable GPI will first decrease and then increase slightly.The same logic applies to PBC variables in Figure13. However, we can see that the phase 1 impact of SN is slightly stronger,

reaching 1.2, indicating that SN is more sensitive to the impulse response of GPI than PBC.

In addition, the impulse responses of GPI variables to SN and PBC variables eventually tend to be stable, indicating that the impulse responses of GPI to both variables eventually tend to a stable state.

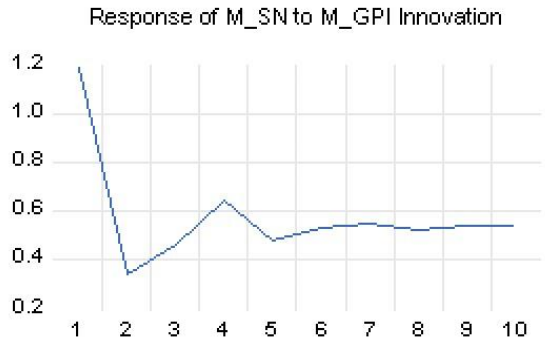

Figure 12: Response of M_SN toM_GPI innovation

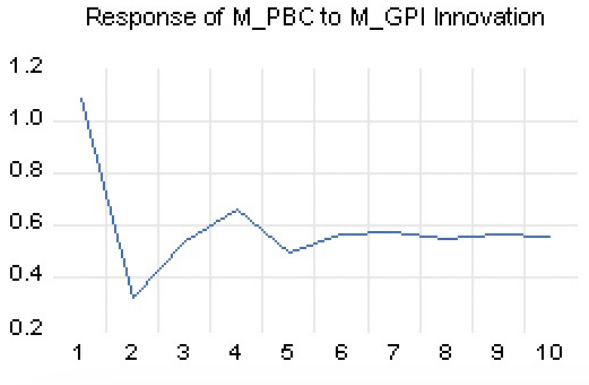

Figure 13: Response of M_PBC toM_GPI innovation

4.6 Chapter summary

The data in this chapter are analyzed using econometric software such as SPSS, including reliability testing of the sample, basic statistics, and correlation coefficients. A high significant positive correlation was found between the four variables.

According to the results of multiple linear regression analysis, the hypotheses of H1 and H2 are both supported. The hypothesis of H3 was also confirmed based on the results of the VAR model.

5 Summary and Conclusion

5.1 Introduction

In this chapter, the relationship between the empirical analysis results and theory is discussed, and the flaws and limitations of this study are raised.

5.2 Summary

Two variables SN and PBC were observed to have a positive impact on GPI and the overall linear relationship proved to be significant. GPI has a positive impact on GPV. And SN and

PCB have a dynamic impact on GPI.

5.3 Conclusion

According to the results of empirical analysis, it is found that both SN and PBC have a positive driving effect on GPI, and SN is the main influencing factor of GPI. Compared with the two, SN is more important, but the impact of the latter cannot be ignored. The two have a greater impact on GPI.

SN and PBC are used as independent variables in the model, which is consistent with the fact that subjective norms and perceived behavioral control jointly promote green purchase intention and promote the development of green consumption.

GPI has a clear promoting effect on GPV, which means that green purchase intention will affect the green perceived value of college students, indicating that the consumer group will form green perceived value by purchasing green products.

Although we can discover the influence between variables by constructing linear equations, it is not enough to only focus on the statistical results obtained by linear models. Therefore, the dynamic relationship between SN and PBC on GPI was explored. GPI is affected by the impulse response of SN and PBC, and SN and PBC have a dynamic relationship with GPI. It shows that subjective norms and perceived behavioral control affect green consumption at different stages, and that the green consumption intention generated by college students' group norms and behavioral control is delayed and periodic.

However, the empirical research in this article has obvious flaws. It uses loose data as time series data and applies it to the VAR model. Moreover, the variance decomposition results of the VAR model are not very descriptive, so they are not included in this article. This may be related to whether the variance of the sample sequence is representative. However, this article broadens the idea of quantitative analysis for the factor analysis of green purchase intention, and through the integration of empirical research, it clearly analyzes the factors affecting green consumption and promotes the application and development of related fields.

About the Authors

Li Jinghan was born in Tianjin, China, in 1992. He earned a Master’s degree in Economics from Hiroshima University in Japan. He is currently enrolled in a Ph.D. program in Malaysia Lincoln University College, with his primary research areas being econometrics and management.

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