Remittances Review
May, 2023
Volume: 8, No: 3, pp. 503-519
ISSN: 2059-6588 (Print) | ISSN 2059-6596 (Online)
remittancesreview.com

Received: 11 November 2022 Accepted: 15 March, 2023
DOI: https://doi.org/10.33182/rr.v8i3.34

Research on the dissemination path of ancient Chinese literature based on discrete regression algorithm in the era of big data

Zijun Wang*[1]

Abstract

As a treasure of Chinese culture, the investigation of the dissemination path of ancient Chinese literature is an important anchor point for inheritance and development. In this paper, we combine ridge regression and quantile regression to perform ridge regression on the sample data of dissemination degree and dissemination path of ancient literature, and then perform quantile regression on the dissemination path variables obtained after screening by ridge regression, and further regression tests are conducted on the variables directly excluded by ridge estimation to finally establish the discrete regression equation of dissemination degree and dissemination path of ancient literature. The coefficients of video dissemination were greater than 0 at all quartiles from 0.1 to 0.9, indicating that video dissemination had a positive effect on dissemination degree at all quartiles. In contrast, the effect of self-publishing on propagation is significant at quantile points greater than 0.4, and the coefficient of sound propagation passes the test of significance level of 0.05 at quantile point 0.3. Based on the analysis of discrete regression, an effective communication model of ancient Chinese literature is established, which lays the foundation for its deeper communication in the era of big data.

Keywords: *Ancient Chinese literature, ridge regression, quantile regression, transmission degree, transmission path*

Introduction

Five thousand years of history have shaped Chinese civilization, and how many wonderful ancient literatures have left a great spiritual wealth for the next generation, without which we cannot talk about Chinese civilization (Sun et al., 2022)-(Zhang & Wang, 2021). Ancient Chinese literature is an important part of Chinese civilization, and without ancient literature, Chinese civilization would lose its source, its faith, and its hope for progress (L. H. M. Wang J, 2019) (Y. Q. J, 2019b). Only by insisting on the modern value of ancient Chinese literature can we take Chinese civilization seriously. With the enrichment of material and cultural life, people's demand for spiritual culture is getting higher and higher, which makes the importance of popularizing and passing on ancient literature gradually increase, and Chinese people are more and more interested in the study of ancient literature (Huang Y F, 2019) (Dai X, 2019) (Y. Q. J, 2019a). In the context of the development of the new media era, literary communication has entered new forms, such as

[1]Art Management, Department of Performance, Film, Animation, Sejong University, Seoul, 05006, South Korea
Corresponding author: Zijun Wang (Clivia996@163.com)

digital communication, real-time interaction, and information sharing, which have promoted the development of literary undertakings. In the process of inheritance and development of ancient Chinese literature, in order to promote the dissemination of ancient Chinese literature, we should innovate the way of communication work, create targeted literary communication work plans according to the actual demands of the audience, and achieve the expected goal of modern communication of ancient literature (Wang, 2019) (Wang N, 2019) (H, 2019).

In the research work on ancient Chinese literature, the literature (Z. T. J, 2019) suggests that contemporary traditional Chinese opera performances can clearly promote the dissemination of literature, and this promotion not only strengthens the dissemination of the literary works themselves, but also gives new value to ancient Chinese literature and historical culture in modern society, constituting an important part of contemporary cultural construction with both a long history and national characteristics.

The literature (Liang X, 2015) explored the value of ancient Chinese literary elements in the dissemination of youth martial arts, taking the program "Martial Arts - New Three Character Classic" as an example, and pointed out that "Young China Says" and "Thousand Character Classic" together with traditional martial arts make us feel the contemporary charm of traditional culture. The literature [(Kaiju, 2018) conducted a study on the international dissemination of ancient Chinese literature, and the results showed that, based on the understanding of the target readers, different translation stages of Chinese literature, such as text selection, translation standards and reading effects, showed similar characteristics.

In addition, the literature (Z. J. Wang J, Liu J, 2016) studies that in the industrialized and information society, it is necessary to make full use of the advantages of mass media to rejuvenate traditional ancient Chinese literature.

At the same time, traditional Chinese literature, in its development, can inherit excellent national culture, liberate individual souls, and improve cultural soft power. Taking American sinologist Burton's Selected Chinese Poems as an example, literature (L, 2019) explores the reflections of ancient Chinese literature when disseminating it across languages, arguing that the translators had strong consideration for readers when choosing the original texts, paying great attention to the literary, topicality and emotional interest of the originals. The literature (C, 2017) examines two versions of The Song of the Long Hatred by Xu Yuanchong and Fletcher, in which translators can alternate between domestication and exoticization in order to convey the original text concisely and spread the culture effectively.

This paper investigates the basic characteristics, advantages and disadvantages of ridge regression and quantile regression, and points out that the parameter selection of ridge regression and the covariance of quantile regression have complementary relationships.

On this basis, a discrete regression method combining ridge regression and quantile regression is proposed, in which a new set of independent variables is obtained by first eliminating those with strong covariance from the ridge regression analysis, and then a quantile regression analysis is performed on this set of independent variables. The integrated regression model was applied to the study of the dissemination of ancient Chinese literature, setting the degree of dissemination of literary works as the response variable, establishing the set of independent variables based on the dissemination paths of sound dissemination, video dissemination, self-media dissemination and educational dissemination, and eliminating the text dissemination and oral transmission paths according to the ridge regression.

Among them, the data of the dependent and independent variable sets were obtained through 12 selected ancient literary works, including poetry, prose, novel and drama. Finally, the analysis based on the discrete regression yields the effects of different transmission paths on the degree of transmission of ancient literature.

Combination of ridge regression and quantile regression

Ridge regression analysis

Ridge regression model

Consider the classical linear regression model:

$$Y = X\beta + \varepsilon \quad (1)$$

where Y is the observation vector, X is a $n \times p$-column full rank matrix of explanatory variables, β is a p-dimensional vector of last known coefficients, ε is a n-dimensional random error vector, and $\varepsilon : \ N(0, \sigma^2 I)$.

Define Λ as the diagonal matrix consisting of $X'X$ eigenvalues and T as the matrix obtained by standard orthogonalization of the eigenvectors of $X'X$, so that equation (1) can be rewritten in the following form:

$$Y = XT'T\beta + \varepsilon = Z + \alpha \quad (2)$$

Among them $Z = XT, Z'Z = \Lambda, \alpha = T'\beta$

Equation (2) is the canonical form of the linear regression model.

Therefore, the least squares estimate of α is:

$$\hat{\alpha}_{OLS} = \Lambda^{-1} Z'y \quad (3)$$

Its i st element is:

$$\hat{\alpha}_{OLS_i} = \frac{z_i' y}{\lambda_i}, i = 1, 2, \ldots p \quad (4)$$

where z_i is the i rd element of Z and λ_i is the i th diagonal element of Λ. This estimator has

$$E\left(\hat{\alpha}_{OLS}\right) = \alpha, Var\left(\hat{\alpha}_{OLS}\right) = \sigma^2 \Lambda^{-1}, Var\left(\hat{\alpha}_{OLS_i}\right) = \sigma^2 / \lambda_i \quad (5)$$

Therefore, the least squares estimate of β is $\hat{\beta}_{OLs} = T\hat{\alpha}_{OLS}$.

Clearly, $\hat{\alpha}_{OLS}$ is an unbiased estimate of α. $\lambda_1, \lambda_2, \ldots, \lambda_p$ is the eigenvalue of $X'X$ and the mean square error of α is:

$$MSE(\alpha) = E\left(\hat{\alpha}_{OLS} - \alpha\right)' \left(\hat{\alpha}_{OLS} - \alpha\right) = \sigma^2 \sum_{i=1}^{p} \frac{1}{\lambda_i} \quad (6)$$

In the application of multiple linear regression, matrix $Z'Z$ may approach singularity, i.e., eigenvalue λ_i is very small close to 0 for some i.

This is due to correlation between the explanatory variables, and such correlation is called multicollinearity. In problems with multicollinearity, the least squares estimates of the regression coefficients become unstable.

More precisely, the mean square error of the estimates of the regression coefficients becomes very large, and it can be obtained from equation (7) that the mean square error tends to infinity when one of the eigenvalues of matrix $Z'Z$ is very small and tends to zero.

Many attempts have been made to improve least squares estimation, and in general there are two approaches, one looking for biased estimates but with smaller mean squared error (MSE) than least squares estimation (OLS), as is the case for many shrinkage types, and ridge regression is one such example.

Although such estimation methods do not directly address the multicollinearity of the problem itself, such estimation methods are often used in solving multicollinearity problems. In these estimations, ridge regression estimation is used to solve the multicollinearity problem indirectly by constraining the length coefficients. Conversely, another approach is to deal directly with the independence of the explanatory variables, as exemplified by principal component regression.

Hoerl and Kennard (1970) proposed ridge regression estimation as an alternative to least squares (OLS) in dealing with multicollinearity problems. The ridge regression estimation is:

Volume: 8, No: 3, pp. 503-519
ISSN: 2059-6588 (Print) | ISSN 2059-6596 (Online)

$$\hat{\alpha}_R = \left(Z'Z + kI\right)^{-1} Z'y, \hat{\beta}_R = T\hat{\alpha}_R \tag{7}$$

where I is the unit matrix, $k > 0$. The explanatory model of the ridge regression is shown in Figure 1. The corresponding mean square error is:

$$MSE\left(\hat{\alpha}_R\right) = \sigma^2 \sum_{i=1}^{p} \frac{\lambda_i}{\left(\lambda_i + k\right)^2} + k^2 \alpha'(X'X + kI)^{-2} \hat{\alpha}_{OLS} \tag{8}$$

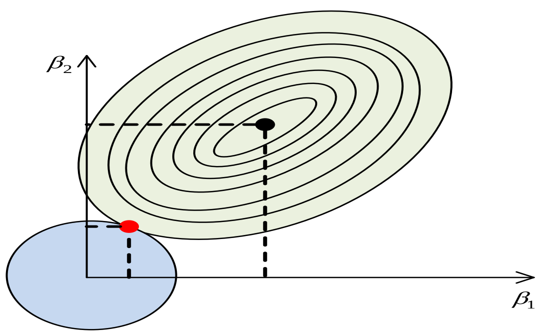

Figure 1: Explanatory model of ridge regression

Selection of parameters

In general, when selecting the ridge parameters, it is hoped that the mean square error of the ridge estimate is minimized by selecting the appropriate k value, while the k value cannot be selected without the unknown parameters α and σ^2, so the k value should be selected according to the actual problem and data. The visual and intuitive way to select k values is the ridge-trace plot method, which is to draw the change curve of the ridge estimate for all explanatory variables and clearly and intuitively select the k values that make the ridge estimate curve of each regression coefficient in the regression equation tend to be smooth. Some other scholars have proposed formulas to calculate the values of the ridge parameters.

Many scholars have studied different methods to determine the ridge parameters of the ordinary ridge estimator (ORR), and the methods commonly used in this paper to select the value of k in the ordinary ridge estimator are:

$$k_{15} = \max\left(\frac{\hat{\sigma}^2}{\hat{\alpha}_i^2} + \frac{1}{\lambda_i}\right) \quad i = 1, 2, .p \tag{9}$$

where P is the number of columns of matrix X, n is the number of rows of matrix X, and α^ is

Volume: 8, No: 3, pp. 503-519
ISSN: 2059-6588 (Print) | ISSN 2059-6596 (Online)

the least squares (OLS) estimator α ̂OLS. α ̂i is the *i* th term of the unbiased estimate of $\hat{\alpha}_{OLS}$, and $\hat{\alpha}_{\max}$ is the largest term of the unbiased estimate of $\hat{\alpha}_{OLS}$. λ_i is the i th diagonal element of matrix $Z'Z$, $\lambda_{\max}$ is the largest diagonal element of matrix $Z'Z$. $\hat{\sigma}^2$ is the least squares estimate of the variance σ^2 of the random error term.

Quantile regression

Quantile regression model

For any random variable Y , all its properties can be portrayed by the distribution function of Y , i.e. For any $0<\tau<1$, define the quantile of the random variable Y as:

$$Q(\tau)=\inf\{y:F(y)\geq\tau\} \tag{10}$$

It completely portrays the properties of the random variable Y , and it can be seen that when compared with $F^{-1}(\tau)$,

There exists a fraction of proportion τ that is smaller than quantile $Q(\tau)$ and a fraction of proportion $1-\tau$ that is larger than quantile $Q(\tau)$.

For the quantile regression model, the loss function is denoted as:

$$\rho_r(u)=u(\tau-I(u<0)) \tag{11}$$

Where, $0<\tau<1$ function:

$$I(u<0)=\begin{cases}1, & u<0\\ 0, & u\geq 0\end{cases} \tag{12}$$

is the indicative function, then the indicative function is a segmented linear convex function. Substituting the schematic function formula into the loss function yields:

$$\rho_r(u)=u(\tau-I(u<0) \tag{13}$$

Figure 2 shows the image of the function of $\rho_\tau(u)$ when $\tau>|\tau-1|$ and $\tau<|\tau-1|$. The loss function $\rho_\tau(u)\geq 0$ can be seen from the form of the above loss function and the loss function is segmented.

Volume: 8, No: 3, pp. 503-519
ISSN: 2059-6588 (Print) | ISSN 2059-6596 (Online)

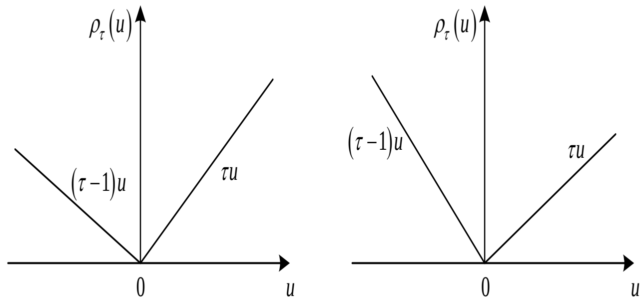

Figure 2: The image of the function of $\rho_\tau(u)$

Taking the first order derivative of $\hat{\xi}$ gives:

$$0=(1-\tau)\int_{-\infty}^{\hat{\xi}} dF(y)-\tau\int_{\hat{\xi}}^{+\infty} dF(y)=F(\hat{\xi})-\tau \tag{14}$$

When the above equation has a unique solution, $\hat{\xi}=F^{-1}(\tau)$. introducing an asymmetric linear loss function $\rho_\tau(u)$ yields a point estimate of the quantile. If there are multiple solutions, the left end point of the solution interval is taken.

Basic properties of quantile regression

The absence of a requirement for the distribution of random errors is a feature of quantile regression, so any probability distribution can be the distribution of random errors. The model built by quantile regression is robust, and the analysis using quantile regression is particularly effective when the distribution is asymmetric, thick-tailed, and censored. Quantile regression is a regression on all quantile points and is therefore resistant to outliers in the data and more comprehensive in the analysis of the data. Quantile regression is monotonically invariant and can be used to interpret the changed data accordingly based on the findings of the initial data quantile regression. The parameters estimated from quantile regression have asymptotic goodness under large sample theory.

(1) Covariance

Covariance occurs when the data in the model changes and the estimates change accordingly. The quantile regression has covariance, so the findings of the quantile regression of the original data can be used to explain the findings of the changed data accordingly.

The findings of the quantile regression of the original data can be used to explain the findings of the changed data accordingly.

Volume: 8, No: 3, pp. 503-519
ISSN: 2059-6588 (Print) | ISSN 2059-6596 (Online)

Let A be any $p \times p$ non-singular matrix and $\hat{\beta}(\tau, y, x)$ be the τ quantile regression of observation (y, X), then the following conclusions hold for $r \in R^P, a > 0$ as well as for any $\tau \in [0,1]$. where Conclusions I and II represent the change in the estimate due to a change in the scale (i.e., constant multiple) of the dependent variable y, Conclusion III represents the change in the estimate due to a change in the location parameter (i.e., translation) of the dependent variable y, and Conclusion IV represents the effect of a change in the parameters of the observation matrix on the estimate:

$$\begin{cases} \hat{\beta}(\tau, ay, X) = a\hat{\beta}(\tau, y, X) \\ \hat{\beta}(\tau, -ay, X) = -a\hat{\beta}(1-\tau, y, X) \\ \hat{\beta}(\tau, y + Xr, X) = \hat{\beta}(\tau, y, X) + r \\ \hat{\beta}(\tau, y, XA) = A^{-1}\hat{\beta}(\tau, y, X) \end{cases} \quad (15)$$

(2) Asymptotic

Suppose $Y_1, Y_2, \ldots, Y_n$ is a sequence of independent identically distributed random variables with distribution function $F(x)$.

For probability level τ, the distribution has a continuous density function $f(x)$ in the neighborhood of $\xi_\tau = F^{-1}(\tau)$. The τ level quantile of the sample is:

$$\hat{\xi} \equiv \inf_{\xi} \left\{ \hat{\xi} = \min_{\xi \in R} n^{-1} \sum_{i=1}^{n} \rho_r \left(Y_i - \xi \right) \right\} \quad (16)$$

The first order derivative of ξ is:

$$\begin{aligned} g_n(\xi) &= n^{-1} \sum_{i=1}^{n} \left(I\left(Y_i < \xi \right) - \tau \right) \\ &= n^{-1} \sum_{i=1}^{n} I\left(Y_i < \xi \right) - \tau \end{aligned} \quad (17)$$

This also shows that $g_n(\xi)$ is monotonically increasing with respect to ξ. As the value of ξ increases, the indicative function increases, so $g_n(\xi)$ increases.

Remittances Review
May, 2023
Volume: 8, No: 3, pp. 503-519
ISSN: 2059-6588 (Print) | ISSN 2059-6596 (Online)

(3) Robustness

Robustness refers to a property of the data that is insensitive to the presence of outliers and violations of model assumptions. When there is some deviation or difference between the overall distribution and the assumed distribution, it is generally expected that the good nature of the estimator will be maintained and will not be greatly affected, and such an estimator is called a robust estimate. Quantile regression does not make any assumptions about the distribution of the random error term, so the model built using quantile regression is robust. The influence function is usually used to analyze the robustness.

This paper describes the effect of the contamination function on the function θ defined on the distribution function $F(x)$, denoted as $\theta(F)$. The contamination function contaminates the distribution function $F(x)$ by changing the partial value εF of $F(x)$ at point y to ε (y is any real number). The contaminated distribution function is:

$$F_s = \varepsilon\delta_y + (1-\varepsilon)F \qquad (18)$$

where δ_y is a single-point distribution with probability 1 taking value y.

Comparing the influence functions for the mean and median, under the mean function, $F(x)$ is affected by contamination at y in proportion to y, and it causes the mean of the estimated quantity to deviate from the correct mean as long as the difference between point y and the mean is relatively large. For the median, since the influence function is related to $\mathrm{sgn}(\cdot)$, the influence by infection at point y is bounded. The comparison shows that the median is more robust than the mean.

The conclusion of robustness also applies to other quantile and quantile regression problems. τ

The influence function of quantile can be obtained by replacing $\frac{1}{2}$ in Eq. with τ. The boundedness of the quantile influence function remains, thus showing that the effect of outliers on the quantile regression is relatively small and the model built using quantile regression is relatively robust.

Combination of ridge regression and quantile regression

In order to analyze the data with multicollinearity and to make the established regression equations meaningful, a combination of ridge regression and quantile regression was used to analyze the data. Ridge regression is used to eliminate the independent variables with strong covariance, and then quantile regression is used to analyze this group of independent variables,

Remittances Review
May, 2023
Volume: 8, No: 3, pp. 503-519
ISSN: 2059-6588 (Print) | ISSN 2059-6596 (Online)

which can avoid the influence of multicollinearity between independent variables on the regression equation, and also analyze the regression equation of different quantile points to make a reasonable interpretation of the data.

Ridge regression analysis of sample data

For n sample observations, each observation has p variables $x_1, x_1, \ldots, x_p$. The data are first standardized to eliminate the influence of the magnitude on the data, and then the independent variables are filtered according to the principle that the coefficients of each independent variable tend to be stable and the absolute value of the coefficients is significantly different from 0 in the ridge trace diagram to obtain a new set of independent variables $x_1, x_1, \ldots, x_l$, where $l < p$. The ridge trace diagram of this new set of independent variables is then obtained by SAS software. The ridge parameters were determined and the regression equation was established.

Quantile regression of the obtained independent variables

Quantile regression under ridge regression means that a new set of independent variables $x_1, x_1, \ldots, x_l$ is subjected to quantile regression of the dependent variable to obtain the coefficients of the independent variables at different quantile points. This results in the coefficients of the independent variables in the quantile with the highest number of independent variables passing the significance test at the 0.05 level and the smallest p values of the independent variables that do not pass the test, and establishes the regression equation. The model established by direct quantile regression of the data is compared with the model established by direct quantile regression of the data to reflect its superiority. The data are then compared and analyzed in conjunction with the regression equation established from the first step.

Quantile regression for variables that were directly excluded

One by one, for independent variable $x_l, x_{l+1}, \ldots, x_p$, which was directly excluded in the ridge regression analysis, the quantile regression of the dependent variable was performed, and the values of the regression coefficients of the independent variables and their corresponding constant terms were obtained at different quantile points to analyze the trend of the influence of these factors on the dependent variable. This step is essential because each independent variable has an effect on the dependent variable, and direct elimination without considering its effect on the dependent variable will lose a lot of information and lead to incomplete analysis results.

The combined application of ridge regression and quantile regression allows the coefficient changes of each independent variable at different quantile points to be studied, and together with the quantile regression analysis of the excluded independent variables, the information in the data is maximized and therefore a more comprehensive and reasonable interpretation of the model can be made.

Regression model of the dissemination path of ancient Chinese literature

Communication paths in the era of big data

Transmission through sound

Earlier, ancient Chinese literature was expressed and passed down in the form of opera. The new media era has added new elements to the presentation of opera, for example, multimedia technology can be used to create choreography when performing on the opera stage, using a vivid image of the stage background to give the audience a direct visual impact, so that the audience seems to be in the real situation, thus arousing the audience's interest in opera.

Music is one of the most popular forms of artistic expression in the new media era. For example, Su Dongpo's "Song of Water Tunes" has been widely circulated through composing and mixing music, and its catchy rhyme and rhythm make ancient literature widely spread in the new era.

Digital audio technology is a representative of technological innovation in the new media era. Ancient literature was originally transmitted through sound before being recorded in the form of text. And digital audio technology has realized the reverse operation of converting text into audio, and various e-books, book reviews and other emerging art forms have contributed to the dissemination of ancient literature.

Dissemination through video media

The most common form of artistic expression of ancient literature today is film and television, whether it is a movie, a television series or a popular variety show that provides the most convenient way to disseminate ancient Chinese literature. The video medium enables the process of visualizing textual information and literary imagery. For example, literary works such as "Dream of the Red Chamber" have been remade several times, using visual images to maximize the restoration of literary works and their artistic creation, giving ancient literature a richer modern dimension so that it can be passed on and promoted.

Dissemination through self-publishing channels

The dissemination of information on the Internet is fast and open, and there are various ways for people to obtain literary works, and the values of literary works are used in the dissemination process to cultivate the literary literacy of the nation. The development of society has brought about the rise of various self-media, and the widespread use of cell phones has brought new opportunities for the dissemination of ancient literature, and self-media has made reading for all possible. Many online authors like to combine their own experiences and feelings to create their works, so that the exchange of identities can be achieved in the communication and exchange of identity, thus enabling literary works to enter the vision of the general public.

Transmission through educational channels

As an educational base, schools play an important role in cultivating students' future all-round development, and the rapid development of new media has provided a new direction for school education. In the era of new media, ancient Chinese literature should be more widely disseminated in the process of school education, so as to strengthen the education of national literacy in students' days, cultivate the national awareness of inheriting and promoting traditional Chinese culture, and make unremitting efforts to achieve the great mission of Chinese cultural revival.

Regression modeling

Determination of impact factors

In the era of big data, the dissemination of ancient Chinese literature is often a combination of multiple paths.

In order to explore the influence of different dissemination paths on the dissemination of ancient Chinese literature, the independent variable characterization of dissemination paths is established as shown in Table 1.

Table 1: Independent variable characterization of propagation paths

	Sound	Video	Self-Media	Education
Coefficient 1	x_{11}	x_{12}	x_{13}	x_{14}
Coefficient 2	x_{21}	x_{22}	x_{23}	x_{24}
Coefficient 3	x_{31}	x_{32}	x_{33}	x_{34}
Coefficient 4	x_{41}	x_{42}	x_{43}	x_{44}

Combined with the ridge regression, the dependent variables of textual transmission X_5 and oral transmission X_6 were eliminated, and the dependent variables of ancient literary transmission were identified as $X_1=\{x_{11},x_{12},x_{13},x_{14}\}$, $X_2=\{x_{21},x_{22},x_{23},x_{24}\}$, $X_3=\{x_{31},x_{32},x_{33},x_{34}\}$, and $X_4=\{x_{41},x_{42},x_{43},x_{44}\}$.

Study population and sample data

In this paper, ancient poems, novels, essays and miscellaneous dramas were selected as the research objects.

The strain variable is communication are, noted as Dis, and the sample data are established as shown in Table 2.

Remittances Review
May, 2023
Volume: 8, No: 3, pp. 503-519
ISSN: 2059-6588 (Print) | ISSN 2059-6596 (Online)

Table 2: A sample of ancient literary communication

Literary works	Dis	X_1	X_2	X_3	X_4
Reed	0.857	0.2951	0.3281	0.046	0.3308
Song of the Long Hatred	0.744	0.4066	0.0627	0.1791	0.3516
The Difficult Road of Shu	0.642	0.3139	0.3163	0.0517	0.3182
The Moon of the West River	0.847	0.4014	0.2035	0.3356	0.0595
Red Cliff Fugue	0.534	0.1365	0.2964	0.2564	0.3106
The Table of the Master	0.517	0.265	0.0144	0.3431	0.3774
Dream of the Red Mansions	0.766	0.2639	0.2946	0.289	0.1525
Romance of the Three Kingdoms	0.855	0.419	0.1094	0.4513	0.0203
Outlaws of the Marsh	0.885	0.2227	0.0371	0.0781	0.6621
Journey to the West	0.784	0.348	0.1588	0.4759	0.0173
The Western Chamber	0.94	0.1843	0.1603	0.3215	0.334
The Autumn of the Han Palace	0.76	0.2932	0.3119	0.1141	0.2809

Regression analysis results

Combined regression analysis of propagation degree

The regression coefficients at different quantile points in the discrete regression of the propagation degree and propagation path of the sample of ancient literary works are shown in Figure 3. The estimated values of each parameter of the quantile regression will change with the change of quantile points, which indicates that the magnitude, positive and negative effects of each independent variable on the dependent variable are different at different quantile points.

The coefficient of independent variable X_2 passes the significance test at a significance level of 0.05 at each quantile, indicating that the effect of video propagation on propagation is consistently significant. The coefficients are all greater than 0, indicating that video propagation has a positive effect on propagation at all quartiles, and the regression coefficients of video propagation are the largest at quartiles less than 0.7, indicating that the effect of video propagation on propagation is the largest at these quartiles.

The coefficient of the independent variable X_3 passes the test of significance level of 0.05 at the quantile points greater than 0.4, indicating that the effect of self-media dissemination on the degree of dissemination is significant at the quantile points greater than 0.4. The regression coefficient of the highest price at the quantile above 0.8 is greater than the regression coefficient of the lowest price and becomes the most influential independent variable on the degree of spread for all communication channels, indicating that the influence of self-media communication on the closing price is the greatest at these quantile points.

Remittances Review
May, 2023
Volume: 8, No: 3, pp. 503-519
ISSN: 2059-6588 (Print) | ISSN 2059-6596 (Online)

The coefficient of independent variable X_1 passes the test of significance level 0.05 at the 0.3 quantile and 0.1 at the 0.4 quantile, indicating that sound propagation has a significant effect on propagation at the 0.2 quantile, and it can be seen that the coefficient of sound propagation is small 0 at all quantile points, which indicates that it has a negative effect on propagation.

As a whole, the coefficients of the independent variable X_1, X_2, X_3, X_4 at the 0.3 quantile point all pass the significance test at a significance level of 0.05, indicating that their effects on propagation are all significant, which indicates that the regression equations established at the different quantile points are meaningful.

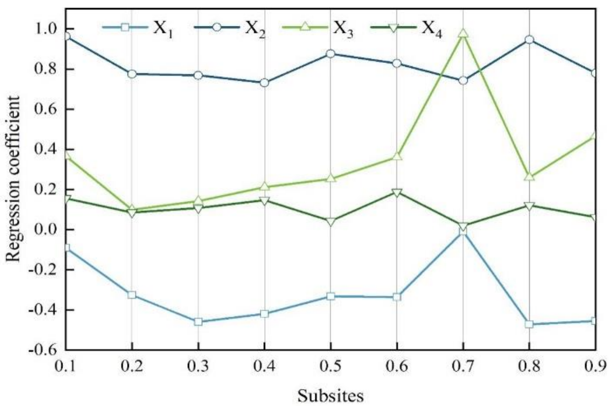

Figure 3: Regression coefficients at different quartiles

Quantile regression for the excluded independent variables

Since the effect of a single independent variable on the dependent variable is studied, the increase or decrease of the coefficient of the independent variable alone cannot determine the increase or decrease of the explanatory power of the independent variable on the dependent variable, but also depends on the change of the constant term. Further quantile regressions were done for the exclusion variables X_5 (word propagation) and X_6 (word of mouth). The results of the quantile regression for the excluded variables are shown in Figure 4. The coefficient of independent variable X_5 only passed the significance test at the 0.4 quantile at a significance level of 0.05, while its corresponding constant term failed this significance test only at the 0.4 and 0.5 quantile, indicating that textual transmission had little effect on the transmission of the selected ancient literature sample. The independent variable X_6 passed the significance test at the 0.05 level in both the middle and high quartiles, indicating that the effect of word-of-mouth transmission on the degree of transmission of the selected ancient literature sample is relatively significant. The coefficients of independent variable X_6 are different at different quartiles, but they are all greater than 0. This indicates that it is positively correlated with the dependent variable and has a positive effect on the degree of dissemination, i.e., the greater its value, the higher the degree of dissemination.

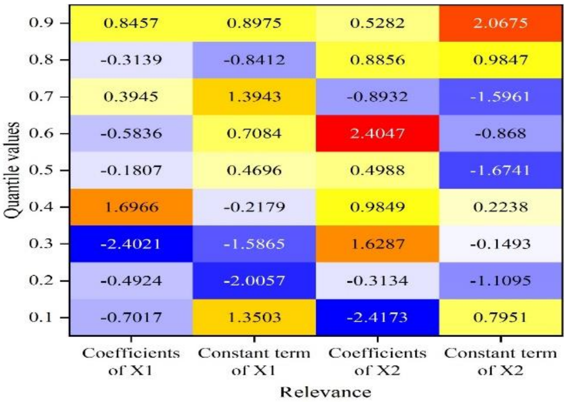

Figure 4: Quantile regression results excluding variables

Conclusion

In this paper, a discrete regression method combining ridge regression and quantile regression was established with the degree of dissemination of ancient Chinese literature as the response variable and different dissemination paths as the independent variables.

The effect of video transmission on the degree of transmission was found to pass the significance test at the quantile level of 0.05 from 0.1 to 0.9. The following conclusions were drawn from this study:

(1) In the era of big data, the dissemination of ancient Chinese literature has withstood severe challenges, broken the limitations of traditional communication methods in time and space, and continuously injected fresh vitality into ancient Chinese literature.

(2) At present, the dissemination of cultural values and connotations of ancient Chinese literature is still hindered by various undesirable cultures and information that does not conform to the mainstream ideology of society in the context of big data. Therefore, the dissemination of ancient Chinese literature should also be shouldered by every citizen of the new era, and only through better integration of ancient literature with new media can we achieve better dissemination of ancient Chinese literature.

(3) In the context of new media communication, the dissemination of ancient Chinese literature should be in line with the development trend of the times, cater to the spiritual demands of the people, innovate the ways and means of ancient literature communication, and promote the high-quality dissemination of ancient Chinese literature.

References

C, G. Y. (2017). Domestication and Foreignization Tendency and Cultural Dissemination in Translating Ancient Chinese Poetry into English——A Case Study of the English Versions of Chang Hen Ge. *Education Teaching Forum*.

Dai X, B. L. (2019). Literary Discourse and Chinese Cultural Characteristics: Present Situation and Future Development of Ancient Chinese Literature Theory. *Journal of Sichuan Vocational and Technical College*.

H, T. W. (2019). Discussion on Ganoderma lucidum in Ancient Chinese Literature. *Edible Fungi of China*.

Huang Y F, W. L. (2019). The Construction of Translation Model in Ancient Chinese Literature Theories——A Case Study of Creative Treason in the Translation of Feng Gu in Wen Xin Diao Long. *Journal of Zhaotong University*.

J, Y. Q. (2019a). Meditations on the Reform of Ancient Chinese Literature Based on the Theory of OBE. *Journal of Shantou University (Humanities & Social Sciences Edition)*.

J, Y. Q. (2019b). Outcome-orientation and Problem Consciousness——On the Course Design of Ancient Chinese Literature. *Journal of Shantou University (Humanities & Social Sciences Edition)*.

J, Z. T. (2019). The Facilitation of Ancient Chinese Literature Spread Caused by Original New Theatres——A Case Study of New Yue Opera Works. *Journal of Zhaotong University*.

Kaiju, C. (2018). Loyal and Flexible Translation and Dissemination of Chinese Literature: A Review of Journey of Sinologists' English Translation of Chinese Literature. *INTERDISCIPLINARY STUDIES OF LITERATURE, 2*(1), 153-158.

L, H. (2019). On Translator's Consideration for the Readers in the Dissemination of Chinese Literature to the West——A Case Study on American Sinologist Burton Watson's ST Selection of Chinese Poetry. *Journal of Guangzhou University (Social Science Edition)*.

Liang X, W. P. (2015). On the Value of Ancient Chinese Literature Elements in the Dissemination of Wushu in Adolescents——Taking "Wushu·New Three Character Book" as an Example. *Wushu Science*.

Sun, X., Hu, L., Hu, B., Sun, X., Wu, X., Bi, N., . . . Yang, Z. (2022). Remarkable signals of the ancient Chinese civilization since the Early Bronze Age in the marine environment. *Science of the Total Environment, 804*, 150209.

Wang J, L. H. M. (2019). An Academic Work on the Experience in Ancient Chinese Literature and History Studies: Reflections on Hardship and Joy: Zhou Xunchu's Experience in Doing Research. *Library and Information Studies*.

Wang J, Z. J., Liu J. (2016). On the Development of Traditional Chinese Literature under the Mass Media Dissemination. *Journal of Hebei Software Institute*.

Wang N, U. B. (2019). The Inheritance and Development of "Crane" in "Stone Story" to Ancient Chinese Literature. *ournal of Qiqihar Junior Teachers' College*.

Wang, Y. (2019). The image of wolf in artistic animalism of "The Song of Igor's Campaign" and ancient Chinese literature. *RUDN Journal of Studies in Literature and Journalism, 24*(3), 424-

432.

Zhang, W., & Wang, H. (2021). Recognition and Analysis of Emotional Words in Ancient Chinese Poetry under Different Themes. *Proceedings of the Association for Information Science and Technology, 58*(1), 548-552.