

Retraction

Retracted: Analysis on Forestry Economic Growth Index Based on Internet Big Data

Mathematical Problems in Engineering

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

- [1] Q. Duan, L. Kan, and S. Tsai, "Analysis on Forestry Economic Growth Index Based on Internet Big Data," *Mathematical Problems in Engineering*, vol. 2021, Article ID 2286629, 11 pages, 2021.

Research Article

Analysis on Forestry Economic Growth Index Based on Internet Big Data

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The development of economic forestry industry is an important support in the process of rural revitalization strategy and precise poverty alleviation, as well as enrichment of the people. As the market of economic forestry products is close to a perfectly competitive market, brand effect is crucial under homogeneous competition, and economic forestry product enterprises and other business entities need to win and maintain sustainable competitive advantages through brand management. Currently, in the field of economic forest, products such as Chinese wolfberry, jujube, blueberry, fungus, walnut, tephrosia, hazelnut, and chestnut and forest foods and product brands with certain market recognition have emerged, but for most small- and medium-sized economic forest product enterprises, forest product brand cultivation and construction are still in the initial stage. Under the rapid development of the Internet, different types of Internet platforms, which provide new tools and possibilities for branding, the way of corporate brand marketing, and customer management services, have also undergone significant changes. In the market with serious homogenization and increasingly fierce competition, how to establish brand-consumer connection through the Internet platform, strengthen the intensity of consumer participation and connection to the brand, give play to the brand effect, and enhance the brand value in the long term, so as to obtain a new way to win a sustainable competitive advantage, has become an important proposition for all kinds of enterprises, including economic forest product enterprises. Combining the competitive characteristics of economic forestry products and the development of the Internet, the model of brand value enhancement of economic forestry products based on virtual brand communities is constructed. The model takes the experience value obtained by consumers in the virtual brand community as the antecedent and studies the path relationship from experience value, community identity, brand fit, and consumer brand value creation to brand value in four dimensions, utilitarian experience value, emotional experience value, social experience value, and learning experience value, and takes community integration and community support feeling as the moderating variables.

1. Introduction

In 2017, the growth rate of retail sales of cereals, edible oils, meat, eggs, and poultry was relatively low, while the retail sales of aquatic products, dried and fresh fruits, and milk and dairy products, which meet people's demand for high quality, grew faster by 5.4%, 4.8%, and 6.5%, respectively [1]. The retail sales of dried fruits and milk and dairy products grew faster, with year-on-year growth rates of 5.4%, 4.8%, and 6.5%, respectively. Against the backdrop of rising

incomes and consumption intentions, consumers are concerned about product quality, driving the growth in demand for high-quality branded products [2]. Consumers aspire to a healthier and cleaner lifestyle, which drives them to prioritize fruits, vegetables, nuts, seeds, cereals, and other plant ingredients [3]. In 2017, the output of economic forestry products exceeded 180 million tons, and the output value of the economic forestry planting and gathering industry reached 1.3 trillion, accounting for more than 50% of the output value of the primary forestry industry. More than

20% of the per capita net income of farmers in the key counties of economic forestry is from economic forestry income [4]. Increasing the supply of economic forestry products can not only effectively solve the contradiction of China's food and oil competition for land, provide natural, nutritious, safe, and high-quality products for the market, and meet the consumption demand of social residents for high-quality products after the upgrading of consumption but also effectively improve the income of rural farmers, especially in mountainous areas, promote the harmonious development of urban and rural society, and improve the overall competitiveness of the country [5–10].

Although, with the advancement of technology and techniques, the influence of forestry brands has been greatly enhanced [11]. Large enterprises with brand as their core competitiveness are gradually rising, but there is still a large gap between the brand value and other industries, and the brand development of economic forestry products seriously lags behind economic development [12]. In order to promote the upgrading of supply structure and demand structure and the development of forestry industry, it is necessary to play the leading role of the brand and enhance the brand value [13]. In 2017, the former State Forestry Administration has released policies that point out the importance and necessity of forestry brand construction and propose that, in order to accelerate forestry brand construction and protection, it is necessary to clarify the subjects in forestry brand construction and actively cultivate them, promote and publicize the brand products and marketing, etc. [14]. It is also necessary to increase the cultivation of forestry brands, encourage forestry enterprises and other business entities to implement brand development planning, increase brand cultivation investment, and enhance the core competitiveness of brands. The development of Internet technology has created many types of Internet platforms, such as search engine platforms such as Baidu, social platforms such as WeChat and Weibo, official brand websites, portal platforms such as Sina, and audio and video platforms. These Internet platforms play a variety of roles such as media, official websites, forums, and e-commerce and play different roles in brand communication, brand marketing, brand market expansion, and customer service and management, as shown in Figure 1. With the rapid development of the Internet, online marketing extends from traditional brand communities to online, where consumers are brought together with brand as the core theme to generate new consumer relationship networks and form virtual brand communities. Facing the rapid development of social media, more and more companies are creating and operating virtual brand communities in order to strengthen and closely connect with consumers. Virtual brand communities provide favorable conditions for communication and interaction between enterprises, brands, and consumers, interactive communication among consumers, entertainment and socialization of consumers, and emotional connection between consumers and brands [15]. They also provide a highly dynamic and interactive business environment for enterprises and further extend to resource collaboration and value sharing, becoming a new type of

platform for enterprises to manage their brands and gain market value. It has become a new type of platform for enterprises to manage their brands and gain market value, highlighting great advantages in brand management (see Figure 1).

How to reduce the flow of forest products, reduce the transaction costs of forest products, and improve the efficiency of the transaction has become a real problem that needs to be solved for the further development of forestry; for market information transfer, a smooth, standardized, efficient forest product circulation model needs to be established. The application of the Internet in traditional industries has brought vitality and opportunities for the development of traditional industries. In the structure of forest products, regional surplus is a common problem in the forest products market, and the problem arises from the lagging adjustment of the forest product structure. This paper uses questionnaires, data measurement and analysis, and other methods to investigate and study whether foresters use the Internet in their production and operation, what tools they use when applying the Internet, what aspects of production and operation they mainly apply to, and what effects the Internet has on foresters' production and operation, to investigate how to use the Internet to solve the current forestry development. The study investigates how to use the Internet to solve the problem of the low motivation of foresters in production and management in the context of "ecological and social benefits, but not economic benefits," to improve the level of forestry production and management, to promote the improvement of rural public management, and to meet the growing demand of people for ecological and social benefits of forestry under the current level of economic development.

The structure of the whole paper can be described as follows:

In Section 2, we introduced the related work of the Internet technologies and the applications in the related fields. In Section 3, this paper uses modern science and technology, especially theoretical basis and internet application, to explore the functional design and application of equipment, and the goal is to create a more intelligent and three-dimensional model in the future. In Section 4, through the application research of intelligent devices, the realization of improving forestry production and management is carried out.

2. Related Work

Researchers surveyed a random sample of Ohio farmers and used multiple Logit techniques to analyze the results, which showed that older farmers do not tend to explore the usefulness of computers and do not use them for productive business. Educational attainment has a facilitating effect on Internet use, while increasing age is a negative factor [16]. The researchers concluded that rural Internet penetration, Internet use experience, and frequency and willingness of farmers to use the Internet were significantly and positively correlated, suggesting from the side that inadequate rural Internet infrastructure is an important constraint on forest

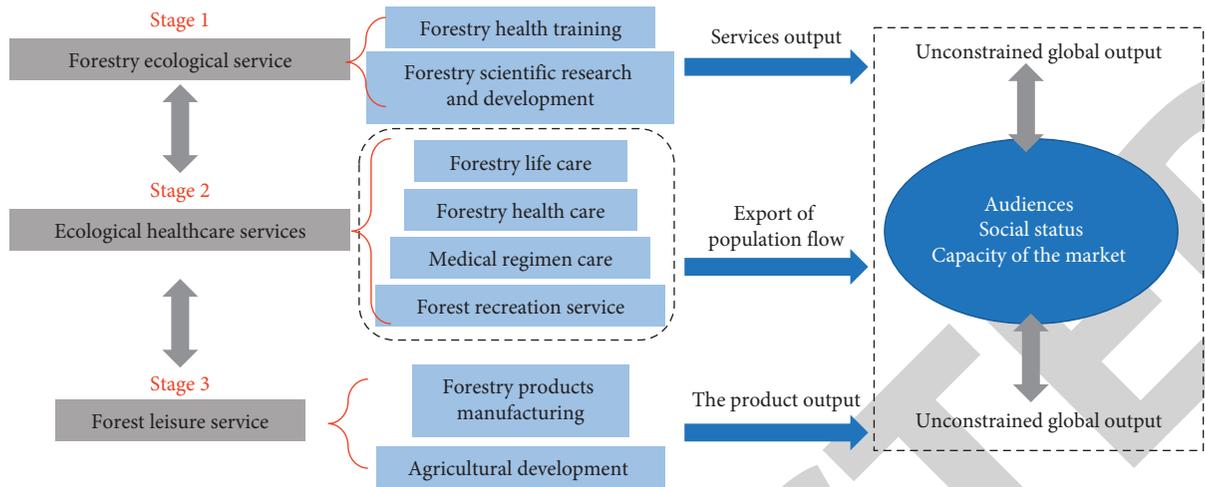


FIGURE 1: Forestry branding strategy in the context of Internet.

farmers’ Internet use and that farmers’ lack of experience in using the Internet inhibits their need to adopt it [17]. The researchers concluded that plantation size has a significant positive effect on forest farmers’ willingness and frequency to use the Internet because the larger the plantation area, the more advantageous the forest farmers are in terms of technology, operation, and marketing than the average forest farmers, the higher their concern and expectation about plantation, the stronger their willingness to explore new technologies and markets and, thus, the stronger their willingness to use the Internet, and the higher the frequency of use [18]. Researchers have studied the development of agricultural information technology in India and learned that the Indian government is actively using information technology to promote agricultural development and to build a “supply chain” model of information sharing network through the market and management sectors [19].

The researchers studied the construction of agricultural informatization in France and learned that France has formulated specific strategies for the development of agricultural informatization according to the current situation of agricultural industries in different regions, and the government has guided and supported different types of agricultural informatization models by supporting the development of diversified information service subjects, respectively. The researchers studied the construction of agricultural informatization in Japan and learned that the Japanese government attaches great importance to the development of the field of agricultural information service system and the field of e-commerce for agricultural products and actively develops precision agriculture. The researchers believe that information technology is a bridge to promote social equity and sustainable development. The Indian government uses information technology to provide market information to farmers to help them understand changes in market supply and demand, and the government and enterprises provide policy and financial support for the incubation of science and technology projects in rural areas. The researchers concluded that India, in terms of rural information, uses administrative resources from the point of

view of meeting farmers’ needs for information and uses a joint government and business approach to promote the issue of access to agricultural information and technology.” The researchers studied agricultural information technology in Germany and concluded that Germany attaches great importance to the development of agricultural information technology and the government actively promotes the widespread use of computer networks and other information technology in agriculture [20].

E-commerce for agricultural products has been studied earlier in developed Western countries, with more research on the use of e-commerce by agribusinesses [21]. The researchers concluded that, in terms of application effectiveness, those firms that collaborate to develop growth opportunities are better able to fully exploit the value of B2B; in the fresh produce industry, this value is built on investments in reputation- and relationship-based assets. The researchers noted that factors preventing agribusinesses from adopting e-commerce include difficulties with cross-border sales, tariff relief, access to rural areas, and cyber security, as well as opportunism and transaction repudiation. The researchers found that the lack of after-sale service, security issues, and privacy concerns are the main factors that prevent farmers from choosing to buy agricultural products online. The researchers’ study found that large agribusiness companies with a global perspective are more likely to adopt e-commerce strategies. Using 30 grocery online stores as examples, the researchers found that product quality signal display, ease of purchase, and product variety were important factors driving consumers to use online shopping. Focusing on online contract negotiations among agricultural supply chain actors, the researchers concluded that synergy among business partners is enhanced with the help of web services, while fostering local independence [22].

The researchers found that local agribusinesses may benefit from adopting e-commerce, with 52% of respondents willing to purchase agricultural products online if prices are lowered or services are more robust, mainly because of time savings; local agribusinesses can also strengthen consumer loyalty by enhancing delivery services. The researchers

studied the interfaces of 211 small- and medium-sized agribusinesses in Italy and found that most of them did not have a payment transaction function, but were only “display windows,” and none of them displayed the characteristic attributes of a virtual community. The researchers use a theoretical model to examine the conditions under which U.S. E-commerce firms enter and exit agricultural input markets and to assess empirical evidence on the entry of e-commerce firms into the U.S. during 1998–2000 to provide explanations for the failure of current first-time entrants [23]. Researchers construct a dynamic discounted flow model to derive the optimal timing of fresh produce e-commerce investments, arguing that the point in time of investment depends on the urbanization rate and the consumer purchase conversion rate from brick-and-mortar to online stores. Based on the study of traditional logistics and distribution models, the researchers point out five problems of how to establish an e-commerce logistics and distribution system and propose a rationalized e-commerce logistics and distribution model for agricultural products.

3. Research Theoretical Basis and Internet Application

3.1. Definition of Internet and Forestry. The Internet is a huge international network, an internetwork linked by the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol between various countries and regions. The main function is to enable the rapid transmission of information through a physically connected network, forming a fast channel for the dissemination of information between information demanders and information suppliers. The “Internet +” is a combination of the Internet and traditional industries, which is not simply an addition of the two, but a deep integration of the Internet and traditional industries using information and communication technology and the Internet platform to create a new development ecology. “Internet +” concept: On March 5, 2015, Premier Li Keqiang first proposed the “Internet Plus” action plan in his government work report at the third session of the 12th National People’s Congress. The “Internet Plus” represents a new economic form, that is, giving full play to the role of the Internet in the allocation of factors of production, deeply integrating the innovations of the Internet in all areas of the economy and society, improving the innovation and productivity of the real economy, and forming a new form of economic development with the Internet as the infrastructure and implementation tool. The “Internet +” is used to better exploit the advantages of traditional industries. The core of “Internet +” is to promote industrial “change and innovation,” so that the traditional industries are transformed to the road of Internet and digital development, and traditional industries rely on “Internet +” to show their strengths in the new situation of the Internet to show greater vitality. The characteristics of the Internet: The Internet has the characteristics of timeliness, interactivity, and diversity relative to other traditional media. It has changed the way of information transmission and effectively reduced the degree of information asymmetry relative to traditional media, as

shown in Figure 2. In economics, an important characteristic of the Internet is its low cost; considering information as a factor of production and using traditional media and the Internet as ways to obtain this factor of production, it is clear that the cost of obtaining information is the lowest using the Internet.

Foresters are family-based units whose family members are permanently engaged in forestry production and management activities, whose family members are employed in forestry production and management activities, and whose forestry income is the main source of family income. The family members of forest farmers are directly engaged in forestry production activities and operate the land they own independently, while they can also hire other laborers to help them engage in forestry production activities. Foresters are farmers who are engaged in forestry industry, cultivate, manage, operate, and protect their own forest land, and own certain forestry production materials. This paper takes forestry farmers who own forestry resources, engage in forestry production and management, and take forestry as the economic pillar as the research object and divides them into two categories according to the different operation situations of the research object: ① general forestry farmers: They refer to the small scale of operation, using their own land and responsibility mountain for forestry production and management as a family unit. ② Large operators: Large forestry operation refers to farmers who also meet the following conditions: ① own or lease others forest land, more capital invested in forestry production and management, with a certain scale of operation: forestry planting scale of more than 50 acres, the annual output of poultry under the forest more than 5,000 feathers, the annual output of large livestock under the forest more than 50 heads, and the annual output of small livestock under the forest more than 300 heads; ② have certain forestry production and management skills, special production and operation funds, professional and technical personnel, and production and operation facilities; ③ or themselves engaged in forestry production and management at the same time and a large number of acquisitions of other forest farmers and forest products for market transactions (see Figure 2).

3.2. Information Asymmetry Theory of Economic Growth Index. It was first in the 1970s that three American economists, Akerlof, Spence, and Stigjiz, paid attention to and studied the phenomenon of information asymmetry. The theory of information asymmetry refers to the fact that there is a difference in the relevant information that various types of people know in the market economic activities; those who are in a more advantageous position are often more fully informed, while those who are poorly informed are in a disadvantageous position. Information asymmetry is divided into ex ante information asymmetry and ex post information asymmetry according to the time of occurrence. Ex ante information asymmetry can be collectively referred to as the adverse selection model, and ex post information asymmetry is called the moral hazard model. Ex ante information asymmetry refers to the information asymmetry

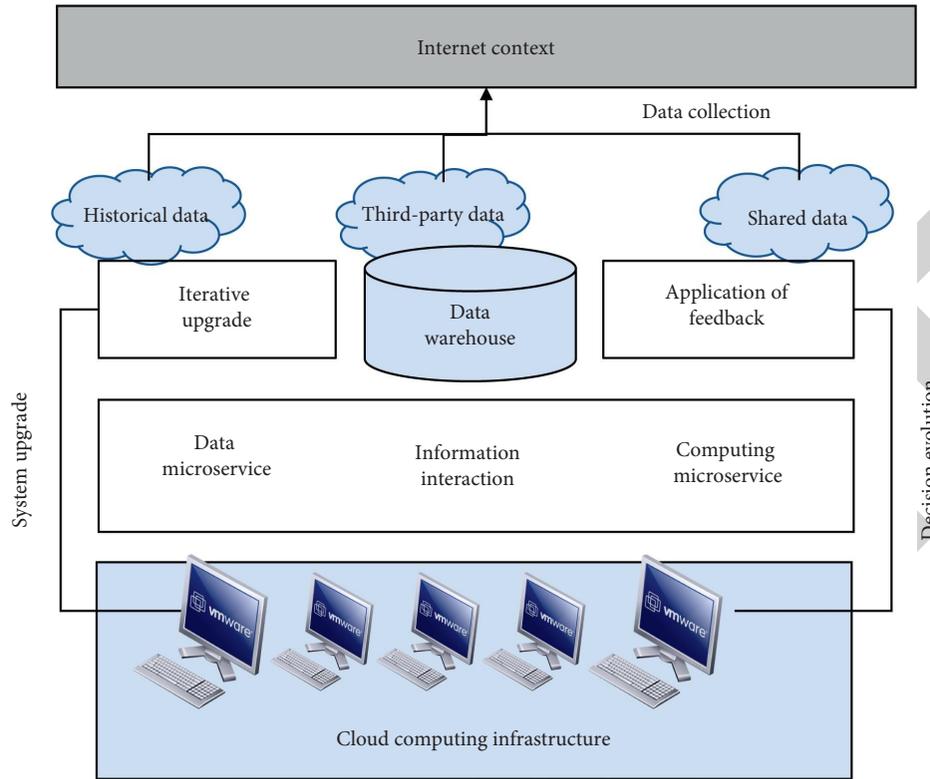


FIGURE 2: Information asymmetry in the Internet context.

before the transaction behavior, the seller knows more than the buyer about the various information about the goods in the market transaction, the seller uses his information advantage to conceal the unfavorable information about the goods in order to gain excess revenue, and the buyer is only willing to pay a lower price when he is not sure about the quality of the goods, at which time adverse selection is formed in the market. Ex post information asymmetry refers to the information asymmetry after the transaction occurs, such as in the labor market, after the establishment of labor relations, the employer is the information disadvantaged party, the worker is the information superior party, and the worker will reduce the efficiency of labor because of their own utility. The “agent” is the party with information advantage in the asymmetric information response, and the “principal” is the party without information advantage. All models of information economics can be analyzed in the framework of principal-agent model.

A breakdown by information asymmetry scenario yields five different models.

- ① Adverse selection model: the agent knows his type while the principal does not, and thus, the information is incomplete. The adverse selection problem arises from the asymmetry of information between buyers and sellers regarding the quality of the car. The adverse selection problem was first introduced by the American economist Akerlof in 1970. In the used car market, the seller knows the true quality of the car, while the buyer does not. Thus, the seller will take the

second best car, while the buyer does not know the real quality of the car, but knows the average quality of the car in the used car market, and may know the average quality out of the medium price, so that the top-quality old car above the medium price may exit the market. The situation that may arise is that the buyer will continue to lower the valuation as the top-quality car exits the market, the subprime car will exit the market, the quality of vehicles in the market is getting lower and lower, and the social turnover is lower than the actual average measure.

- ② Signaling model: the “natural” choice of the agent’s type: the agent’s type is known only to itself and not to the principal, and to show that it belongs to the category, the agent chooses to send a signal, and the principal acts after observing the signal. The signaling model is essentially a dynamic incomplete information response.
- ③ Signal screening model: signal screening refers to the process by which a principal who is at an information disadvantage and does not possess private information acts first to obtain and analyze an agent who possesses private information or induces the agent to reveal his private information. In the signal screening model, equilibrium is the existence of a set of contracts and a selection rule such that each type of employee chooses the one that best suits him or her among all available contracts, and as a result, there exists only a unique separating equilibrium.

- ④ Moral hazard model: information is symmetric at the time of the transaction, the agent chooses actions after the transaction, and the agent's actions together with the state of nature determine certain observable outcomes, while the agent's actions themselves and the state of nature itself are not directly observable. The principal's problem is to design an incentive contract to induce the agent to choose the action that is most beneficial to the principal in its own interest.
- ⑤ Moral hazard model with hidden information: information is symmetric at the time of the transaction, after the transaction, the agent observes the natural choice and then chooses the action, the principal observes the agent's action but not the natural choice, and the principal's problem is to design an incentive contract to induce the agent to choose the action that is most beneficial to the principal given the state of nature.

The higher the degree of marketization, the more important the information becomes. The premise of perfectly competitive market is complete information, but in reality, there is no complete information; it is only a theoretical limit concept, which exists as a kind of evaluation standard, and the perfectly competitive market also exists only as a theory. But, there is a positive relationship between the two; that is, the promotion of marketization is bound to be accompanied by the improvement of the quality of information needs because the normal operation of the economy requires continuous feedback adjustment among the participating subjects, and the precondition of feedback adjustment is the accurate and timely communication of information. Since the reform and opening up with the development of market economy, the majority of foresters began to enter the market as the main body of decision making, with information as the basis for decision making on the impact of foresters' income more and more. As the number of decision makers in the market gradually increases, the demand for information increases, and the self-regulation of the market also requires more and more information to be launched. Thus, information becomes more and more important as marketization advances, both in terms of the market economy itself and in terms of the participating subjects of the market economy. Information has different economic effects on its producers and users. For its producers, it is the fruit of labor, and once information is produced, it is reproducible, with different reproduction costs for different communication media, and the cost of information for its producers is the collection cost of information + the dissemination cost of information; when a piece of information is produced for reproduction, only the dissemination cost of information needs to be paid, and when information starts to be reproduced and disseminated in large quantities, the scale effect will occur. The average production cost of each piece of information will be greatly reduced, especially for network communication, the dissemination cost is almost zero, in this case for network communication, and the marginal cost of information production is almost zero, as shown in Figure 3. Information as a factor of production for a single

producer is the existence of diminishing marginal returns. This is mainly because, first, in agricultural production activities, the substitution of information for other factors in terms of agricultural returns is limited and not complete and, second, producers are not limited by other factors of production to produce an unlimited amount of output (see Figure 3).

3.3. Forestry Transaction Costs. The concept of transaction costs was first introduced by Coase. According to Coase, transaction costs are "the cost of using the price mechanism," including the cost of searching for information, negotiating, and contracting to complete a market transaction. Later, in his book *Social Costs*, Coase defined transaction costs more clearly, saying that "transaction costs are the cost of finding out the true facts about the parties to a transaction, negotiating, signing a contract, and carrying out the checks necessary to ensure compliance with the terms of the contract in order to complete the market transaction." The transaction cost is the cost of doing the "ex ante work" before the transaction takes place, and the lower cost of the "ex ante work" helps the transaction to take place; conversely, the high cost of the transaction will prevent the transaction from taking place, as shown in Figure 4.

The earliest concept of "transaction cost theory" was introduced by Coase. Although Coase's early research on transaction cost theory was too broad and lacked practicality, it provided the necessary theoretical perspective for the later development of the new institutional economics. In his book *Markets and Hierarchies*, Williamson analyzed the characteristics of transactions in terms of their three components, making them more actionable, and proposed that "transaction costs are the economic equivalent of friction in physics" and that "the economic system of capitalism is the economic equivalent of friction in physics." "The main objective and role of the capitalist economic system is to save transaction costs," and "opportunism is the core of transaction cost research." Its proposal of three constituent dimensions of transaction composition, namely, the exclusivity of assets, the uncertainty of transactions, and the frequency of transactions, is a necessary prerequisite for the development of transaction cost theory. Another important achievement of Williamson is to attribute the evaluation of transaction costs to the category of comparative institutions, combine transaction costs with economic institutions, and measure transaction costs in terms of the impact of different types of transaction costs on the differences and efficiency of institutions. This important theory provides a research methodology and theoretical paradigm for how to measure transaction costs in practice, reduce them, and achieve the goal of optimal allocation. The level of transaction costs is an important factor affecting whether foresters enter the market or not. This paper analyzes the issues regarding transaction costs in the process of forestry production and management through the theory of operational transaction costs (see Figure 4).

Under the background of traditional forestry, it is difficult for foresters to connect with the outside market, and

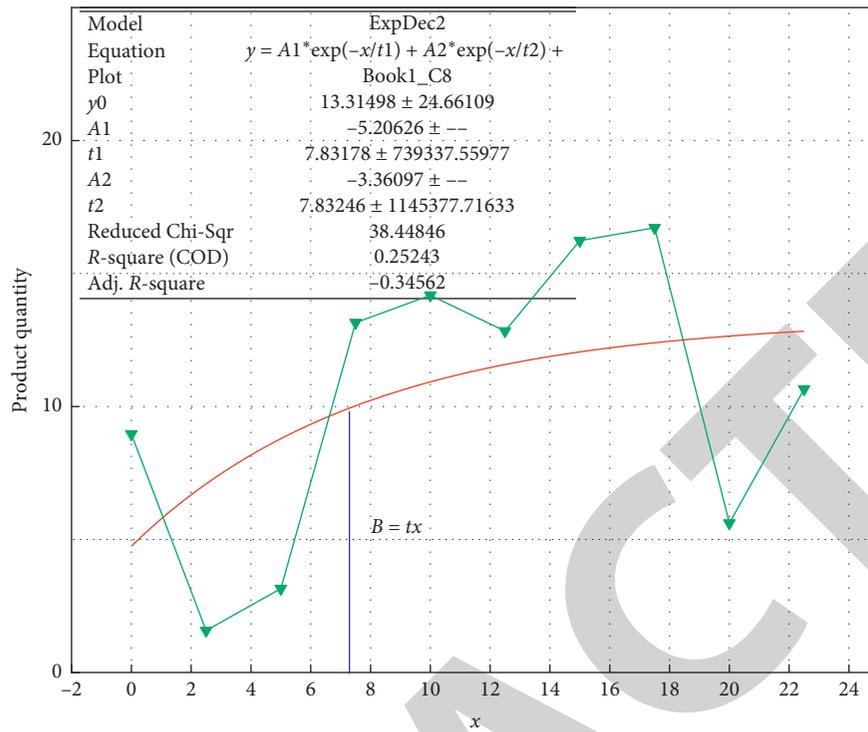


FIGURE 3: Information asymmetry theory of economic growth index.

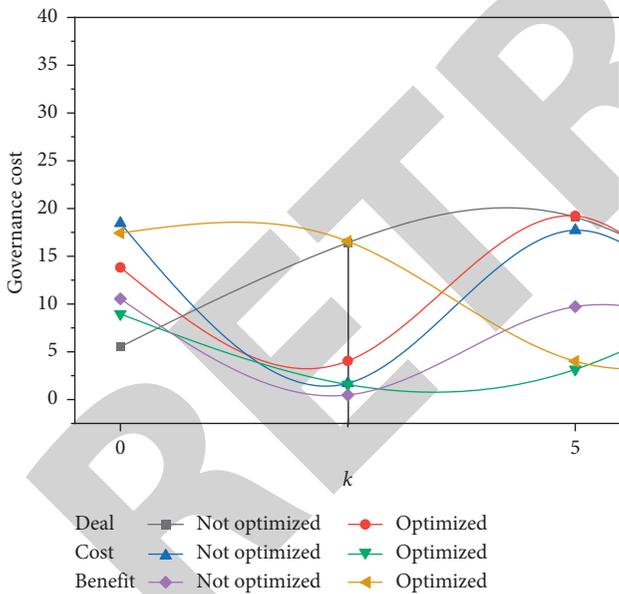


FIGURE 4: Forestry transaction costs.

they cannot grasp the market dynamics in time to implement production, resulting in a large difference between the production and consumption structure of forest products market and an unreasonable structure of forest products. When the “Internet +” information is linked to forestry production, foresters can grasp the market dynamics, adjust production ideas, understand national policies and regulations, and cooperate with production as needed. The Internet has become an information medium for foresters to

interconnect with the outside world, and they can grasp effective information in real time without leaving home, making production decisions effective and intelligent. With the entry of Internet technology into the field of agriculture, the traditional agricultural development model to gradually change, in terms of land transfer, the rise of the “Internet + land transfer” model, in the change of land transfer information delivery method at the same time, to change the rural land transfer problem, provides a new option. The “Internet + land transfer service” not only reflects the gathering and circulation of geoinformation but also includes the allocation and service of customer resources. The land transfer platform can effectively and timely deal with the relationship between the georegion and the customers who need land transfer, including online processing of land transfer information or land demand information and online provision of land transfer services. The “Internet +” action plan has promoted the development of rural e-commerce, which provides a new model for the sale of forest products. E-commerce has broken through the geographical restrictions of rural commodity circulation, providing a new channel for forest products sales, and foresters can sell their products to all over the country through the Internet platform without leaving home. Foresters enter the forestry circulation and sales through the e-commerce platform, directly facing consumers, reducing forest product circulation links, improving transaction efficiency, expanding the scope of transactions, reducing transaction costs, and increasing forestry income. The supply and demand are fully contacted on the network trading platform, which eliminates information asymmetry at low cost, and the consumption and demand are realized directly face to face. The reduction

of intermediate links, on the one hand, saves transaction costs and, on the other hand, improves the efficiency of the transaction and reduces the time of forest products in transit, thus effectively reducing the rate of transport losses and waste. Due to the relatively low cost of information search, forest product price and quality information can be fully flowed, making the market price discovery function further play, and market efficiency is further improved.

4. Analysis of the Role of the Internet in Improving Forestry Production and Management

Structural equation modeling is a statistical method to analyze the relationship between variables based on the covariance matrix of the variables and is an important tool for multisource data analysis score. Compared with traditional regression analysis, structural equation modeling can deal with multiple dependent variables at the same time and test whether it fits the data. Through structural equation multigroup analysis, we can understand whether the relationship between variables within different groups remains constant and whether there is a significant difference in the mean value of each factor, as shown in Figure 5. The structural equation model assumes the following conditions: (i) reasonable sample size: “Multivariate Statistics with Applications to the Social Sciences” says that an average of one independent variable requires about 15 sample sizes, and the researchers believe that an average of one estimated parameter requires 5 sample sizes, provided that the data quality is very good; after conducting Monte Carlo simulations, the researchers found that, for a model containing 21 factors, at least 100 sample number is required. (ii) Continuous and normal distribution of the endogenous variables: structural equation models assume that the dependent and endogenous variables are continuously distributed with normally distributed residuals, and residuals for structural equation model analysis require not only that they obey a univariate normal distribution but also that their joint distribution obeys a joint multivariate normal distribution; however, this assumption is never satisfied in practice. (iii) Model identification: comparing how many inputs are available and how many parameters to be estimated. (iv) Complete data or the appropriate treatment of incomplete data. (v) The description of the model and the theoretical basis of causality (see Figure 5).

The object of this study is the farmers engaged in forestry production and management activities because the small-holder economy takes the family as the production unit, the scale of operation is generally small, and the main purpose of its production is to meet the internal needs of the family, which is decentralized, closed, and self-sufficient, the objective data of the farmers on various aspects of forestry production and management are not recorded in detail, and it is not possible to divorce other influencing factors from the existing recorded objective data on forestry production and management. Therefore, it is not feasible to obtain objective data on the impact of the Internet on forestry

production and management, so this study was conducted from the perspective of foresters, and foresters who already use the Internet in the process of forestry production and management evaluated the role of the Internet in various aspects of forestry production and management. In this study, data were obtained from the perspective of foresters. There are few studies on the impact of foresters' Internet use on forestry production and management, and the independent variables were selected in this paper by synthesizing previous studies and preliminary interviews with foresters. In the study of the role of the Internet on forestry production and management, this paper identifies “the role of the Internet on improving forestry production and management” as the dependent variable and the respondents' opinions on the effect of the Internet on increasing forestry income, increasing the sales volume of forest products, increasing the unit price of forest products, shortening the sales cycle of forest products, expanding the scale of forestry production and management, selecting forestry business varieties, and reducing the cost of forestry production and management. The respondents' evaluation of the role of using the Internet in increasing forestry income, increasing the sales volume of forest products, increasing the unit price of forest products, shortening the sales cycle of forest products, expanding the scale of forestry production and operation, selecting forestry management species, and reducing the unit cost of forestry operation was taken as the independent variable, and the paper assigned values to the five response options of “very large = 5”, “large = 4”, “average = 3”, “little role = 2”, and “little role = 1” to obtain the values of the observed variables.

Among the 642 valid questionnaires collected, 260 sample foresters have used the Internet in the process of forestry production and management, and the statistical software SPSS22 was used to test the data of the 260 samples that have used the Internet on “the role of the Internet in improving forestry production and management.” The differences between the responses to five of the seven questions “shorten the sales cycle of forest products” were significant, meaning that the respondents had more consistent choices for the seven questions. As shown in Figure 6, the mean values of Q1–Q7 range from 2.1 to 2.5; i.e., the respondents' overall evaluation of these 7 items ranges from “little effect” to “average effect.” “This means that most of the respondents think that the use of Internet has little effect on improving forestry production and management. Among the 260 foresters who participated in this questionnaire survey and used the Internet in the process of forestry production and management, there were 188 foresters with small-scale operations. The data of 7 dimensions of “Internet on improving forestry production and operation” were tested by the chi-square test, and the significance values of questions Q1–Q7 were all significantly less than 0.05, as shown in Figure 7; i.e., the surveyed respondents were interested in the effects of Internet on “increasing forestry income,” “increasing forest products sales volume,” “increasing the price of forest products,” “expanding the scale of forestry production and operation,” “selecting forest products business varieties,” “reducing the unit cost of forestry operation,” and “increasing the price of forest

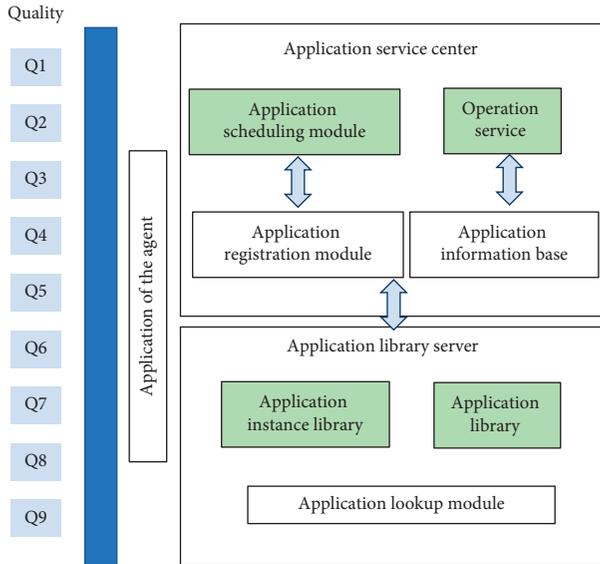


FIGURE 5: Structural equation model path diagram.

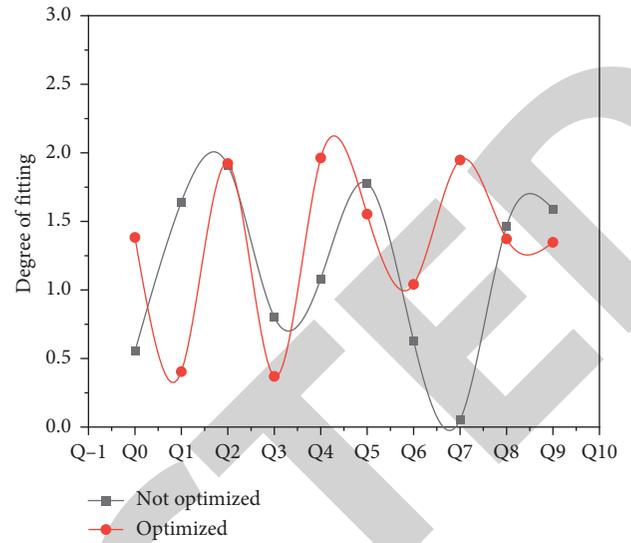


FIGURE 7: Model fit test results.

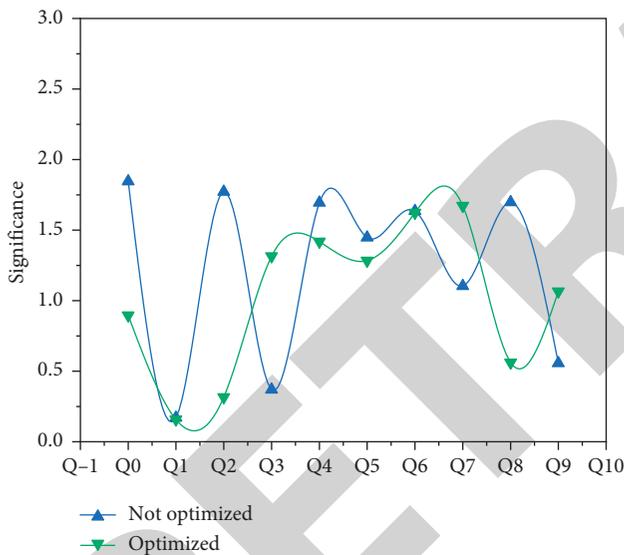


FIGURE 6: Significance of overall sample test statistic.

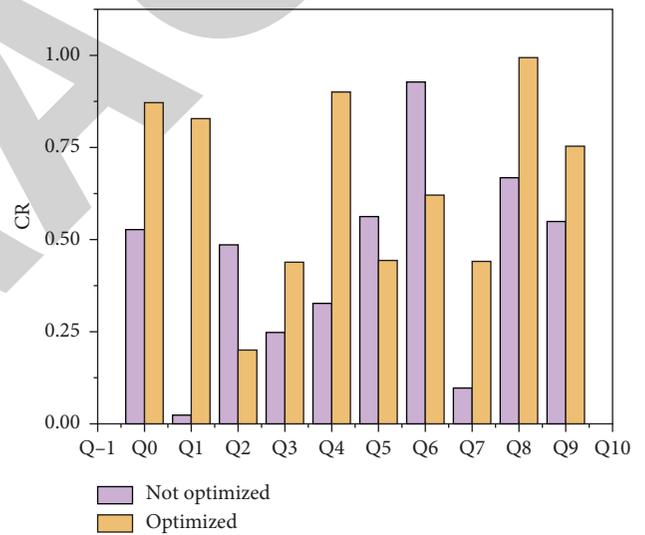


FIGURE 8: Structural equation model path estimation results.

products.” The differences between the responses to five of the seven questions on “reducing unit costs of forestry operations” and “shortening the sales cycle of forestry products” are significant, meaning that the respondents have more consistent choices for the seven questions (see Figures 6 and 7).

The nonstandardized path coefficient of the effect of using the Internet on increasing forestry income in Q1 is set to 1. The nonstandardized path coefficient of the effect of using the Internet on increasing the sales volume of forest products in Q2 is 1.122, standard error 0.077, and CR value 14.562, and significance less than 0.01 is highly significant, as shown in Figure 8. The nonstandardized coefficient of

the role of the Internet in increasing the sales price of forest products is 0.850, standard error 0.097, and CR value 8.736, and significance less than 0.01 is highly significant. Q4: The nonstandardized coefficient of the role of the Internet in expanding the scale of forest products production and operation is 1.069, standard error 0.084, and CR value 12.726, and significance less than 0.01 is highly significant. The nonstandardized coefficient of Q5 Internet on forestry management species selection is 0.831, standard error 0.117, and CR value 7.079, and significance less than 0.01 is highly significant. The nonstandardized coefficient of the effect of Q7 Internet on shortening the sales cycle of forest products is 1.045, standard error 0.092, and CR value

11.372, and significance less than 0.01 is extremely significant (see Figure 8).

5. Conclusions

In the field of economic forest products, forest product brand cultivation and construction are still in the initial stage. It is not feasible to obtain objective data on the impact of the Internet on forestry production and management. The role of the Internet in improving forestry production and management is influenced by the size of the foresters' operations, and the evaluation of the Internet application in forestry production and management is higher among the large operating households than among the small operating households in general. The reason is that general farmers have low forest product production, forest product production is mainly for self-use, and the marketability of forest products is low, while large farmers have high forest product production and high marketability, and most nonwood forest products have the characteristics of short storage time and perishability, so they need to expand the circulation channels for rapid circulation to the market; the larger scale of operation of large farmers can share the fixed costs arising from using the new technology of Internet compared with general farmers, large operators invest more labor and financial resources in forestry production and management, so it is more likely for large operators to find reliable information sources and efficient and low-cost distribution channels through the use of the Internet and the greater is the possibility of improving forestry business income through the use of the Internet. The reason is that the main raw materials for forestry production and operation are seedlings, poultry and livestock chicks, pesticides and fertilizers, agricultural machinery, etc. These raw materials are large in size, nonstandardized, have high transportation losses, and are not easy to purchase through the Internet and transport over long distances, and forestry production raw materials have more stable prices and small differences between regions, so it is necessary to purchase them online, so the use of the Internet has less effect on reducing the operating costs of forestry units.

Data Availability

All information is given within the paper.

Conflicts of Interest

No conflicts of interest exist concerning this study.

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