THE RELATIONSHIP BETWEEN ENVIRONMENTAL PUBLIC PERCEPTION AND GREEN PRODUCT TRADE. THE MODERATING ROLE OF POLICIES AND LEGAL TEXT
/
公众环境认知与绿色产品贸易的关系——政策法律文本的调节作用

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ABSTRACT

In today's increasingly accelerating globalization, environmental protection and sustainable development have become the focus of common concern for all countries. Public environmental awareness, that is, the public's understanding and attitude towards environmental issues, has a significant impact on environmental protection work. Meanwhile, with the rise of green product trade, the market trading of green products is becoming increasingly active. As one of the means to regulate the relationship between public environmental awareness and green product trade, the role of policies and legal texts is increasingly prominent. This article will explore the relationship between public environmental awareness and green product trade and analyze the regulatory role of policies and legal texts in it. This article explores the impact of trade and environmental policies on the financial system through computer software. It constructs a theoretical hypothesis model to explore the moderating effect of policy and legal texts on the relationship between public emotional perception of environmental policies and green product trade. After empirical testing, all research hypotheses in this study have been supported. The results showed that at a test level of 0.01, consumers' perception of green efficacy, perceived green responsibility, green purchasing behavior, emotional arousal, and moderate values were significantly positively correlated. Among them, the R-value of perceived green efficiency and green purchasing behavior is 0.701, and the R-value of perceived green responsibility and green purchasing behavior is 0.638, indicating the degree of correlation between perceived green efficiency, perceived green responsibility, and green purchasing behavior. Green purchasing behavior is highly correlated. The conclusion indicates that the government has further increased export subsidies for the clean industry, implemented differentiated environmental tax policies, and emphasized the coordinated use of procedures, promoting the development of the clean industry and the upgrading of industrial structure.

摘要

在全球化日益加速的今天，环境保护和可持续发展已经成为各国共同关注的焦点。公众环境认知，即公众对环境问题的认识和态度，对环境保护工作具有重要影响。同时，随着绿色产品贸易的兴起，绿色产品的市场交易也日益活跃。政策法律文本作为调节公众环境认知与绿色产品贸易关系的手段之一，其作用日益凸显。本文将探讨公众环境认知与绿色产品贸易的关系，并分析政策法律文本在其中的调节作用。 本文通过计算机软件实现贸易和环境政策对金融体系的影响。本文构建了一个理论假设模型，探讨政策和法律文本对公众对环境政策的情感感知与绿色产品贸易之间关系的调节作用。经过实证检验，本研究的所有研究假设都得到了支持。结果显示，在 0.01 的检验水平下，消费者感知绿色功效、感知绿色责任、绿色购买行为、情绪唤醒和适度价值观显著正相关。其中，感知绿色效能与绿色购买行为的 R 值为 0.701，感知绿色责任与绿色购买行为的 R 值为 0.638，表明感知绿色效能、感知绿色责任与绿色购买行为之间的相关程度。 绿色购买行为高度相关。 结论表明，政府进一步加大对清洁产业的出口补贴，实行差别化的环境税收政策，注重程序的协调使用，促进了清洁产业的发展和产业结构的升级。

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INTRODUCTION

With the increasingly serious global environmental problems, the public's attention to environmental protection is constantly increasing. Meanwhile, with the continuous development of global trade, green product trade has gradually become an important part of global trade. The relationship between public environmental awareness and green product trade has become an important research issue. Public environmental awareness refers to the level and attitude of the public towards environmental issues. The growth of public environmental awareness has promoted the implementation of environmental protection actions, thereby promoting the implementation of environmental protection actions. In terms of green product trade, improving public environmental awareness can promote consumers' demand for green products, thereby promoting the development of green product trade. Policy and legal texts refer to a series of policies and regulations formulated by the government related to environmental protection. These policies and regulations can directly or indirectly affect public environmental awareness and green product trade. For example, the government can formulate environmental regulations to limit environmental pollution, which can increase public awareness of environmental protection. At the same time, the government can also encourage the development of green product trade through subsidies and other policies. Environmental problems are closely related to trade and economic development. Since the industrial age, the rapid growth of science and technology has promoted the rapid growth of the global economy, but it has also produced a series of environmental problems. As an important economic activity, international trade is destined to be closely linked with the natural environment from the moment it comes into being. Along with trade liberalization, in addition to the rapid economic growth, the ecological environment continues to deteriorate, and international trade disputes related to the environment are constantly emerging. With the increasing popularity of environmental protection in the world, the change in people's consumption concept and the enhancement of environmental protection consciousness, this traditional concept needs to be updated. Whether the product meets ecological protection requirements has become an important factor that must be addressed in product competitiveness. As an important engine to stimulate China's economic growth, changing the trade structure can drive industrial structure adjustment (*Cao et al., 2017*). For the current serious environmental pollution situation, the government should introduce policies at the macro level to support the clean industry with low energy consumption and low pollution and promote its export expansion to achieve green and healthy economic development by optimizing and upgrading the industrial structure.

Generally speaking, the paths of initiating and promoting behavior can be divided into rational and the emotional paths. Wang and others think that reason is not the motive of behavior but only the means to get happiness or avoid pain (*Wang et al., 2018*); Daviron believes that the individual's consumption decision results from the interaction between cognition and emotion. Because the individual's cognitive resources are limited, making a completely rational decision is impossible, and the individual's consumption decision has an obvious emotional preference. Emotion, as the information clue of individual preference, will directly impact the consumption decision (*Daviron et al., 2012*). Can et al. believe that under globalization, countries worldwide, especially developing countries, will take the initiative to lower their environmental regulatory standards to gain a competitive advantage in international competition to promote their economic growth (*Can et al., 2021*). Liu et al. concluded that the structural effect caused by international trade has a greater impact on the environment than the scale and technical effects (*Liu et al., 2017*). He took the per capita sulfur dioxide emissions as the environmental pollution index. The empirical results show that for every 1% increase in income caused by trade, the per capita sulfur dioxide emissions will decrease by 1.7%. Schwarz et al. think that the influence of business reputation on perceived risk is very important, and businesses must maintain their reputation (*Schwarz et al., 2019*). Alam et al. further explained the "green trust", the willingness to rely on sending some products, services or brands based on the beliefs or expectations brought by the reputation, good deeds and environmental performance of products, services or brands (*Alam et al., 2019*). Wu's research found that 30% of the respondents claimed to care about environmental issues, but less than 5% would turn positive pro-environment attitudes or motives into real actions (*Wu, 2017*); Chen et al. used the environmental input-output model to study the energy consumption and CO_2 emissions implied by import and export commodities in a country's foreign trade process (*Chen et al., 2019*). The results show that the CO_2 content of non-energy products exported by this country is far higher than that of imported products, and the exported products per unit output consume 40% more energy and emit 56% more CO_2 than the imported products per unit output.

China's rapid economic development, especially international and domestic trade, shows a leap-forward development momentum. However, the rapid expansion of international trade and domestic trade has also consumed many domestic natural resources, leading to many emissions of various pollutants, which has

caused great pressure on China's resources and environment (*Chang et al., 2017*). Under this background, it is particularly important to analyze the environmental pollution situation, the economic development situation and the characteristics of current international trade in China, study their interrelations, find a way to break through extensive and high resource consumption and adjust the industrial structure by developing clean industries with low energy consumption and low emissions. This paper chooses environmental participation, green purchasing attitude and environmental self-efficacy as cognitive factors, emotions as emotional factors, environmental participation as independent variables, green purchasing attitude and environmental self-efficacy as intermediary variables, and emotions as moderating variables to construct a structural equation model, so as to explore the influence of regulatory effects of policies and legal texts on green purchasing intention.

MATERIAL AND METHODS
Environmental pollution in an open economy

For a long time, China's export products have focused on earning foreign exchange, focusing on quantity, ignoring the quality and technical content of products and their environmental costs. Therefore, if our products want to meet these environmental standards and enter these countries' markets, a large part of the funds must be used for testing, certification and appraisal of environmental protection, as well as packaging and labeling of products and high certification and application fees, annual fees for the use of signs, etc. Members are allowed to take temporary environmental protection measures when the scientific basis is insufficient (*Sopranzetti, 2018; Díaz-DaPena et al., 2022*). Our country's enterprises need more and faster knowledge of foreign environmental standard change information, which seriously affects the enterprises' timely adjustment of competition countermeasures. When encountering green trade barriers, they can only do what they can.

Although various regions may have established various trade barriers for the sake of local protectionism, the resistance they face is much smaller than that of international trade. For the backward countries in the global market, domestic enterprises have to pay higher transaction costs in the process of entering international trade, and there is a big gap between them and the leading countries in terms of products and technologies. Therefore, for domestic enterprises, the cost of opening up the domestic market is much smaller than that of opening up the international market. In interregional trade, there is no comparison between import and export. From the perspective of supplier countries, there is no essential difference between interregional trade and international trade. They are both the stage for enterprises to realize their product value and the key step to maintain their survival and expand reproduction.

According to the traditional trade theory, the international trade of commodities is caused by different conditions or comparative interests of countries in production. The comparative interests of a country depend on the availability of factors of production relative to other countries and the investment requirements of various industrial sectors (*Gantman et al., 2018*). Comparative benefits exist based on the environmental differences in different regions. They constitute the internal contradiction between ecological functions. Determined by this contradiction, it will inevitably lead to the environmental problem of how to share scarcity, that is, the allocation problem. It is necessary to seek a combination to maximize the total utility of environmental functions to human beings.

Pollution tax is a policy tool that encourages businesses and individuals to reduce pollution emissions by increasing the cost of pollution through the collection of pollution taxes by the government. Emission costs refer to the expenses paid by enterprises or individuals to reduce or treat pollution. When pollution taxes increase, businesses or individuals need to pay higher emission costs. Emission intensity refers to the amount of pollution generated per unit of production or consumption activities. When pollution taxes increase, companies will reduce emission intensity by improving production efficiency and adopting clean production methods. Polluted products refer to goods or services that generate pollution. When the prices of these products increase, the cost of producing them will increase, including the resource cost of pollution control. Resource cost refers to the cost paid to obtain the resources required for production. In the production process of polluting products, resource costs may include the cost of measures taken to treat and reduce pollution. Common output indicates that three or more production or processes have similar or identical results in output. In this case, pollution may be the common output of three processes, such as X, Y, and Z, all of which produce pollution. Factor input refers to the production factors used in the production process, such as labor, capital, raw materials, etc. When considering pollution as a factor input, it means that pollution is considered a factor of production, which will affect the level and direction of production. Z level refers to the factors or parameters

that affect the production level, such as technical level, policy regulations, etc. In this model, production also changes as the Z level changes. When the pollution tax increases, the emission cost will increase, and the emission intensity will decrease. When the price of polluted products rises, the resource cost for pollution control will be higher, so the emission intensity will increase instead. If pollution is viewed as factor input, the production will change with the level of Z, and the relationship between them is no longer the only one. See Figure 1.
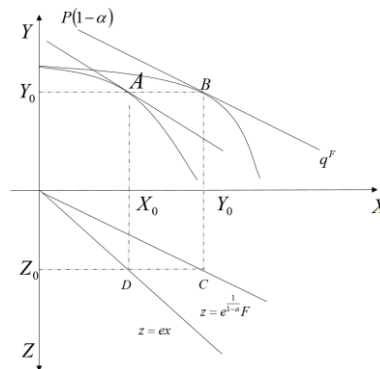

Fig. 1 - Production possibility curve of potential output and net output

In an economic system without pollution control, the maximum potential output of an industry is the possible production boundary. However, due to some resources being used for pollution control, the net output likelihood curve falls within the potential output likelihood curve. This may mean that as pollution control increases, the resources available for production decrease, resulting in a decrease in net output. In this case, e (potential output) and θ there may be a negative correlation between (net output). That is, with the θ the increase in pollution control may lead to a decrease in e. But this is only speculation based on existing information, and the specific situation may vary. Under different Y output conditions, an industry's maximum potential output is the possible production boundary of an economic system without pollution control. Because some resources are used for pollution control, the net output possibility curve is inside the potential output possibility curve. Then there is such a relationship between e, θ:

$$e = (1-\theta)^{\frac{1-a}{a}} \tag{1}$$

The pollution control cost is linked with the pollution discharge per unit output, and the cost brings low pollution discharge per unit output. Can be expressed in terms of price:

$$\theta = 1 - \left(\frac{ap}{\tau}\right)^{\frac{a}{1-a}} \tag{2}$$

It can be known that the proportion of factor resources invested in pollution control increases with the increase of pollution tax but decreases with the addition of product price.

Stimulated by government subsidies, enterprises in developing countries have increased the amount of pollution reduction, and their products have become closer and closer substitutes for those in developed countries. As a result, the price competition between enterprises in the two countries has intensified. To alleviate the intensified price competition, enterprises in developed countries will also increase pollution reduction (*Du et al., 2017; d'Amour et al., 2020*). Therefore, the marginal effect of developing countries' unilateral R&D subsidy on domestic enterprises' pollution reduction is greater than that of developed countries. Under the assumption that all products of the two countries are sold in developed countries, and the pollution discharge and damage caused are limited to developed countries, the social welfare of the two countries can be expressed as follows:

$$w^d = CS^d + \pi^d - D^d \tag{3}$$

$$w^f = \pi^f - s^f \gamma C(d^f) \tag{4}$$

In the given social welfare function, developed countries have relatively abundant capital elements, therefore they have a comparative advantage in the production of capital-intensive products. This means that developed countries have lower costs in producing capital intensive products, thereby gaining more consumer surplus and corporate profits in international trade. Among them, the social welfare in developed countries

consists of the surplus of $\theta \in [\theta^{l*}, 1]$ consumers plus the profit of enterprise minus the pollution damage D^d of two products.

According to the theory of comparative advantage, the capital factors in developed countries are relatively abundant, while developing countries have cheaper labor productivity. Compared with the endowment of labor factors, the endowment of capital factors has a relative comparative advantage.

Import low-pollution, labor-intensive products from developing countries, and the final result of the trade is that all trading countries can benefit from work, and the global total pollution emissions will be reduced. A government can strengthen environmental regulation by imposing an environmental tax on pollution-intensive products. It can achieve the purpose of environmental protection by re-optimizing resource allocation to reduce the production of pollution-intensive products.

Coordination between environment policy and trade of green products

International trade activities may aggravate market failures and worsen the environment. Economically, the fundamental cause of environmental degradation is market failure. Because the market can't correctly price environmental assets, external effects exist. In this way, under the action of market mechanism and guided by price signals, the effective allocation of environmental resources can be promoted, thus effectively protecting the environment. However, it isn't easy to internalize the environmental cost completely for various reasons. Due to the lack of a strong global environmental organization, it is difficult for a country to control its environmental pollution caused by other countries' production or consumption activities. At the same time, trade sanctions or restrictions can affect other countries' production or consumption activities and indirectly achieve the purpose of environmental protection.

For developing countries, the environmental effects of international trade are negative both in the short and long term, and international trade will further worsen the ecological quality. If a country implements higher environmental standards, it will relocate domestic enterprises; However, if a government implements lower environmental measures, it will attract enterprises to enter its production (*Oh, 2017*). Therefore, when an enterprise can choose its location independently, it will increase the distortion effect of environmental policy. As the application of strategic trade policy in new fields, the green trade policy comes into being along with the increasing attention developed countries in Europe and America paid to trade and environmental issues. It adopts green R&D to supplement financial resources and environmental pollutant discharge tax. The strategic effect of the environmental tax is greater than that of R&D technical subsidy; that is, under the same proportion, the former is more effective than the latter in enhancing market competitiveness and transferring strategic profits of enterprises. On the contrary, the effect of the last will be better.

Under price competition, improving low-tech enterprises' product quality reduces the difference, intensifying price competition. In contrast, enhancing high-tech enterprises' product quality increases the difference and eases price competition. Improving the pollution reduction of enterprises' products in developing countries reduces the difference and thus intensifies the price competition. In contrast, that of enterprises' products in developed countries increases the contrast and thus eases price competition. At the same time, improving the quality of high-tech industries reduces the profits of low-tech enterprises. Therefore, the governments of high-tech and low-tech enterprises are motivated to reduce the other enterprises' quality. Although the increase in product pollution reduction of enterprises in developing countries reduces the profits of enterprises in developed countries, it increases the surplus of consumers in developed countries, reduces environmental damage, and improves the overall social welfare of developed countries. Therefore, governments in developed countries still have the strategic motivation to encourage enterprises in developing countries to carry out R&D for pollution reduction.

Trade liberalization has expanded the scale of economic activities, which requires increasing input demand. Suppose the original technology is still used in output realization or sales. In that case, using natural resources and discharging pollutants will increase without effective environmental policy support, thus deteriorating the environmental quality. With the increase in income level, consumers will increase their willingness to buy products produced under stricter environmental standards. In addition, the rise in income level can give the government more financial resources for environmental protection and governance (*Qin et al., 2019*). Countries participating in free trade will more likely produce in sectors with comparative advantages. If a country has the advantage of natural resources, it will lead to specialized production of products with abundant resources. The general equilibrium model constructed in this paper is divided into six modules: production activity module, international trade module, institutional behavior module, investment and savings module, pollution control module and equilibrium module - Figure 2.
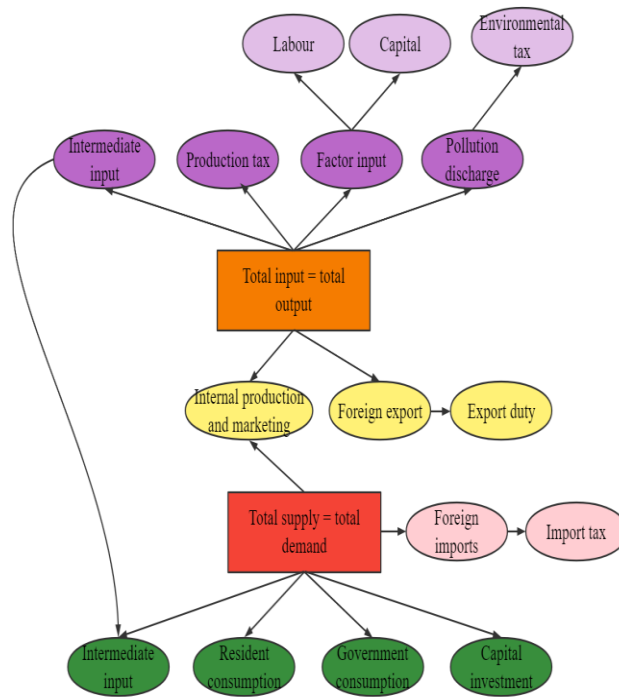
Fig. 2 - Model structure of coordination between environment policy and green product trade

The general equilibrium model studied in this paper is the open economy model, including residents, enterprises, government and foreign four economic subjects. Residents earn income through labor, capital factor income distribution, transfer payments from enterprises and the government, and foreign investment, and pay personal income tax to the government for consumption and savings. The import and export quantities of foreign markets have been determined by Armington conditions and CET (constant elastic transformation) function. In addition, foreign investors will earn income from investments in China's capital market *(Fernández et al., 2018)*.

Armington conditions and CET function have determined the import quantity and export quantity of foreign markets. In addition, foreign investors will earn income from investments in China's capital market (*Fernández et al., 2018*). Domestic products must also be optimally distributed between domestic sales and exports, determined by the relative prices and elasticity of imported and exported household products. The Armington equation is a model used to describe trade between countries, which considers the endowment of production factors and technological differences between countries. The CET function, which often replaces the elastic production function, describes the substitution relationship between production factors. In the study, these two models were combined to construct a general equilibrium model for the coordination of environmental policies and green product trade. In the general equilibrium model of the coordination between environmental policies and green products trade established in this paper, the Armington equation and CET function are chosen to describe it (*Singh et al., 2022*). First, take the logarithm of both sides of the first-order condition of the Armington equation, and you can get the formula:

$$\frac{QM_c}{QDC_c} = \left[\frac{PDC_c}{PM_c} * \frac{1 - \delta_c^q}{\delta_c^q}\right]^{\frac{1}{1-\rho_c^q}} \tag{5}$$

$$ln\frac{QM_c}{QDC_c} = \frac{ln\frac{1 - \delta_c^q}{\delta_c^q}}{1 - \rho_c^q} + \beta\, ln\frac{PDC_c}{PM_c} \tag{6}$$

In the above formula, it is necessary to know four quantities, namely, the import quantity of the commodity sector C, the number of domestic products for domestic sales, and the price ratio of the two, and then estimate the coefficient of the standard logarithmic equation by using the least square method.

Assuming that each manufacturer only produces a single product, the number of products in both countries is also the number of manufacturers in both countries. Assume that policymakers maximize the utility W of the whole society by controlling the amount of pollution emissions that is:

$$W = S[u(C) - \delta D(Z)] \tag{7}$$

Assuming the total social consumption is S, the utility function is u, the pollution emissions are D, and the damage function is $D(Z)$, where Z is a factor that affects pollution damage. According to the title, the utility function u is a concave function of the import quantity of commodity sector C and the domestic product quantity sold domestically, while the damage function $D(Z)$ is a convex function of positive growth in pollution emissions. It can be seen that utility is a function of total social consumption S, utility function u, pollution emissions D, and damage function $D(Z)$. Among them, the concave function of total social consumption with increasing D, Z represents the damage caused by pollution discharge, and it is a positive and growing convex function about pollution discharge, representing the sensitivity coefficient of utility to pollution.

Because the more intensive the pollution discharge, the higher the utilization rate of human capital, thus producing more products and increasing the nominal factor price. Suppose the sensitivity of production cost per unit output to environmental policy is greater than that of R&D cost per unit output. In that case, the productivity increase will be greater than the wage increase. The marginal cost and price will drop when the environment is more relaxed. In the opposite direction, the appearance of new products will also produce an effect: the substitution effect caused by product diversity. When the variety of products is more, and the same income level can buy more kinds of products, the pollution-intensive products will have more opportunities to consume, worsening the environmental quality.

It can be further analyzed the relationship between domestic trade and environmental quality by examining the relationship between international trade and environmental quality. In contrast, the expansion of international trade is conducive to environmental improvement. Our theoretical model assumes that the substitution effect caused by product diversity is greater than the income effect caused by product diversity. Still, it is smaller than the total effect of the income and structure effects. Therefore, trade can promote environmental quality. This paper holds that the structural impact of international trade and the income effect caused by product diversity will promote the improvement of environmental quality. In contrast, the substitution effect caused by product diversity will worsen the environmental quality. The total effect of international trade on environmental quality depends on the interaction of the three outcomes.

When the enterprise's green R&D capability is high, if the government strategically raises the environmental tax, the enterprise will choose to reduce the output first because the income of green R&D investment at this time is not as cost-effective as temporarily decreasing the output to reduce the environmental tax burden. Because the possibility of successful R&D of its new technology is very small or the cost of success is extremely high, the tax burden reduced through green technology innovation cannot compensate the R&D cost. Therefore, when the government continuously raises the environmental tax, the enterprise chooses to reduce the output to reduce its environmental tax expenditure. In an extreme case, the enterprise decides to stop production completely.

Hypothesis of emotion-behavior regulation effect model of policy and legal texts

Green consumption behavior includes the dual purpose of satisfying self-demand and environmental protection demand. Individuals with negative emotions tend to underestimate the value of products, leading to a negative evaluation of products by consumers and then to negative purchase intention. Active consumers ignore environmental problems unconsciously, reducing their sensitivity to environmental issues and making purchasing green products difficult. Under the action of positive emotion, the individual opens up the thinking of solving problems and promotes his cognition and behavior, thus having a positive and far-reaching effect on the individual's future behavior and way of doing things. In the state of fear, human beings will have the consciousness of running away, and in the case of anger, they will tend to aggressive behavior. When an individual is in a negative emotional state, his thinking will focus on the cause and time of the emotional state, his review will become narrow, his vigilance will be enhanced, and he will be nervous easily. Influenced by positive emotions, individuals are more inclined to explore new things and take the initiative to care about the environment.

Generally speaking, consumer professional knowledge includes two modules: subjective knowledge and objective knowledge, in which factual knowledge is the information about products stored in consumers' memory, such as the types of products, the attributes that can be obtained, and the characteristics of evaluation criteria, etc. Performance-based purchasing behavior refers to a sustainable consumption behavior generated by consumers without consideration for protecting the environment and health. Consumers' emotional state

has a positive impact on consumers' purchasing behavior of green, energy-saving and environment-friendly household appliances. Therefore, the pleasant emotion brought by the purchased goods plays an important role in consumers' purchasing decisions. The value points out that there are differences between the perceived value of public emotion and the traditional dimension because the social value contained in the conventional perceived value has duality, specifically including the improvement of customers' image and the concern of the ecological environment, so the division of social value and green value is harmonious. In contrast, the division of the value of the image and environmental protection efficiency value is more specific.

The psychological trade barrier of consumers is a difficult index to quantify, and purchase intention plays an important role in the occurrence of purchase behavior, and it is a predictive index to promote the event of purchase behavior. Therefore, in the empirical analysis, this paper measures whether the psychological trade barrier of consumers exists through the perceived quality of foreign products and the purchase intention of foreign products. The standards recognized by this nation are universally applicable, and external groups need to refer to their standards and be consistent with themselves; that is, internal groups evaluate external groups and determine their standards. In the research field of consumer behavior, attitude affects consumers' buying behavior, but attitude does not directly influence consumers' buying behavior. Attitude often affects consumers' buying behavior through their willingness to buy certain products.

Therefore, this study assumes that green buying behavior can be divided into two basic dimensions: buying green products and resisting non-green effects, as shown in Figure 3. Compared with the simple dichotomy, this classification method makes a more detailed analysis of green buying behavior, which better describes the complex multidimensional characteristics of green buying behavior. Accordingly, the two-factor hypothesis of green buying behavior is put forward.
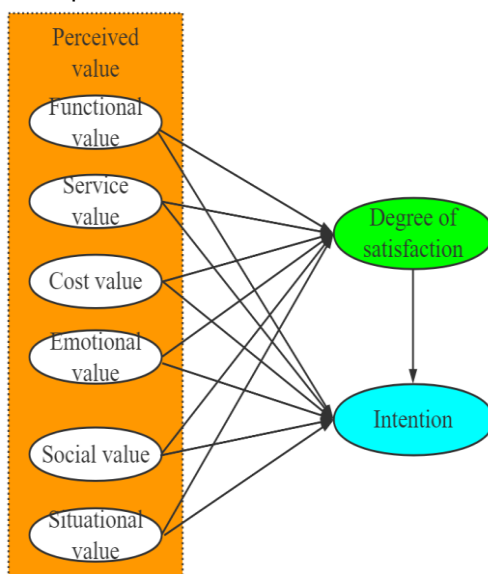

Fig. 3 - The hypothesis of the emotion-behavior dual-factor model of green purchase

Products can be divided into two categories according to their green degree. The first category is that the products consume less energy, resources, or environmental pollution, among similar products. When consumers know the green attributes of products and make conscious purchase decisions, the previous decision to resist non-green effects will positively impact this decision to buy green products. Therefore, this study puts forward the hypothesis.

Hypothesis 1: Resisting the behavior of non-green products has a significant positive impact on the behavior of purchasing green products.

Because consumers with positive environmental sentiments tend to ignore environmental problems and underestimate the environmental protection value of green products, they will not consider the importance and urgency of purchasing green products enough, resulting in positive environmental sentiments that are not conducive to forming the purchase intention of green products.

However, the poor brand image will make the customers who intend to make the original purchase change their purchase decisions and reconsider whether to buy the product or service or buy other similar brands. The perceptual point of view is that customers make purchasing decisions according to subjective criteria such as personal feeling and status, an intangible benefit that products give customers. These two

views show that products' tangible and intangible benefits can drive consumers' demand. Accordingly, the following assumptions are put forward:

Hypothesis 2: Negative emotions upward regulate the positive relationship between green buying attitude and green buying intention.

Purchase intention is the possibility for customers to buy a certain service or product, and customers will decide whether to accept the service or product after they have a certain objective understanding of the image of the service or product. In addition to considering consumers' perceived value of products when selling products, enterprises should also consider the reference group and other external factors that will affect consumers' purchase intention. Public emotional perception affects customer satisfaction first and then customer behavior tendency. Based on the research of scholars, this study thinks that the perceived value of public emotion can affect consumers' purchase intention and puts forward the following theoretical assumptions:

Hypothesis 3: Perceived value significantly impacts consumers' purchase intention.

Compared with the use of strategic environmental tax alone, the government will still adopt a higher balanced environmental tax rate under the policy combination of strategic environmental tax and green R&D subsidy, or the combination of green R&D subsidy policy can effectively improve domestic environmental standards. When people are aware of the importance of the environment, the consequences of environmental deterioration and their responsibility for improving the environment, they will actively develop a green circular economy. The sense of responsibility will affect consumers' green purchasing behavior and mediate the relationship between consumers' psychological factors and purchasing behavior. The greater the positive emotion is awakened, the stronger the individual's perception of green effectiveness and green responsibility will be, and the greater the possibility of the individual's green purchasing behavior will be. Therefore, the following assumptions are put forward:

Hypothesis 4: In the positive emotional state, policy and legal texts have a positive and significant impact on green buying behavior and play an intermediary role in the influence of positive emotional appeal on buying behavior.

International trade mainly affects environmental quality through structural effects, income effects caused by product diversity and substitution effects caused by product diversity. Therefore, in the analysis of this section, according to the mechanism of international trade and domestic trade on environmental quality, the following empirical model is constructed:

$$
\begin{aligned}
ln\,P\,ollu_{i,t} = \beta_0 &+ \beta_1\,ln\,I\,nter_{i,t} + \beta_2\,ln\,I\,ntra_{i,t} + \beta_3\,ln\,G\,DP_{i,t} + \beta_4\,ln\,P\,op_{i,t} - dens_{i,t} \\
&+ \beta_5\,ln\,F\,DI_{i,t} + \beta_6\,ln\,C\,om_{i,t} + \varepsilon_{i,t}
\end{aligned}
\tag{8}
$$

Among them is the discharge of three pollutants in each province; $Inter$ is the international trade of various areas; $Intra$ is the domestic trade of each province; GDP is the economic scale of each province; $Pop - dens$ is the population density of each province, the actual use of foreign direct investment in various provinces; Com represents the industrial structure of each province; ε is the error term.

RESULTS
Simulation analysis of coordination between trade policy and environmental policy

Free trade may prompt those polluting production and processing processes to move to those areas with relatively loose environmental regulatory policies. Therefore, there is no need to reduce consumption or increase pollution control. Rich countries can enjoy abundant consumption and a clean environment by importing pollution-intensive products from other countries. The world has been divided into two regions, the North and the South, and the countries in these regions jointly determine the world market price. Every region is made up of many identical countries. The only difference between the two regions is that the strictness of the pollution emission policies they implement is different. If the pollution emission policies between the two regions are the same, there will be no trade between them. At the same time, whether in the South or the North, the pollution emission policy may be looser or stricter than the optimal policy.

The trade policy of reducing export tax rebates is mainly aimed at economic behavior, which has a weak effect on improving the environment. The way of resource allocation is based on the optimization of economic output, which may increase pollutant emissions in the short term. In this section, it is proposed to simulate the coordinated use of the two policies, change the restrictions on the use of the policies alone, and study how to control pollution emissions while maintaining steady economic development.

Scenario 1: Increase the export tax rebate for lightly polluted industries from 5% to 7% of the benchmark tax rate. The environmental tax collection standards are chemical oxygen demand, ammonia nitrogen, sulfur dioxide and nitrogen oxides. The collection standards are 1.5 yuan/pollution equivalent, 1.3 yuan/pollution equal, 1.1 yuan/pollution equivalent and 1.1 yuan/pollution equivalent, respectively.

Scenario 2: Increase the export tax rebate for lightly polluted industries from 6% of the benchmark tax rate to 9%, and the environmental tax collection standard is the same as scenario 1.

From the simulation results, the coordinated use of trade policy and environmental policy greatly impacts the trade structure. Under the dual effects of the two approaches of polluting industries, the export is reduced, which is larger than that of the policy alone, and the import also begins to show positive changes. As shown in Table 1.

Table 1

Influence of coordination between environment and green product trade on import and export of various industries

Industry type	Scenario 1		Scenario 2	
	Export	Imported	Export	Imported
Severe pollution	-0.638	0.187	-1.207	0.336
Moderate pollution	-0.551	0.154	-0.966	0.215
Light pollution	0.408	-0.051	0.805	-0.095
Non-pollution	0.369	-0.122	0.548	-0.173

From the simulation of the coordinated use of environmental policy and green product trade, the result is better than that of policy alone. The measures of increasing export tax rebates for lightly polluted industries will help the export of clean industries to improve, and the change of domestic output will make the import also change, showing a positive trend. The author believes this is mainly due to the relative support of the two policies for developing clean industries, which are attributed to the heavily polluted industries. When the domestic demand cannot be met, the supply must be increased through imports, leading to the increase of importance of heavily polluted industries.

Through industrial wastewater, industrial solid waste, industrial waste gas, industrial smoke and dust, industrial powder and industrial sulfur dioxide, the regression analysis of mixed effect, fixed effect and random effect models of international trade, domestic trade and environmental pollution is carried out. First, all variables are described statistically, as shown in Table 2.

Table 2

Statistical description of variables

Variable	Mean	Standard deviation	Min	Max
Pollu	36031.21	9630.25	8036.71	18966.28
Inter	3506.71	2054.87	21.36	5058.96
Intra	9871.42	6625.89	1086.77	8806.91
GPD	3305.69	2861.24	2216.89	6328.72
Pop-dens	386.01	450.28	425.03	7524.86
FDI	30.06	44.12	42.16	251.47
Com	0.51	0.23	0.19	1.05

International trade hurts industrial wastewater and industrial solid waste, which shows that the development of international trade has inhibited the emissions of these two environmental pollution indicators and has a significant role in promoting environmental quality. The total effect of international trade on environmental quality depends on the comprehensive impact of these three effects. Therefore, among the four environmental pollution indicators, the substitution effect caused by product diversity is dominant. For domestic trade, the substitution effect caused by product diversity is far greater than the income effect caused by product diversity.

Using the cointegration system test based on VAR (Value at Risk) method, the following results are obtained in Table 3:

Table 3

Cointegration test of sulfur dioxide, dependence on foreign trade and support on foreign investment

Suppose	Eigenvalue	Statistic	5% key value	Probability
Assumption 1	0.3905	18.6523	35.5722	0.5825
Assumption 2	0.3877	10.6335	41.5923	0.5505
Assumption 3	0.1827	31.1362	13.7554	0.6582

The import and export trade and foreign direct investment increase in China's trade liberalization have always affected China's environmental quality. In the investigated period, foreign exchange is related to the discharge of environmental pollutants. Foreign direct investment also aggravates China's environmental load. The reason is that most foreign direct investment in China has a low level of investment. With the continuous increase of foreign investment, its production scale is also expanding, thus aggravating the pressure of environmental pollution.

The impulse response function test is mainly used to describe the system's dynamic characteristics, that is, the impact of the change or effect of each endogenous variable on itself and all other endogenous variables. GIRF (generalized impulse response function) is a commonly used method, so this method is used for the analysis below. The impact response period is set to 100, and the analysis results obtained after the simulation are shown in Figure 4.
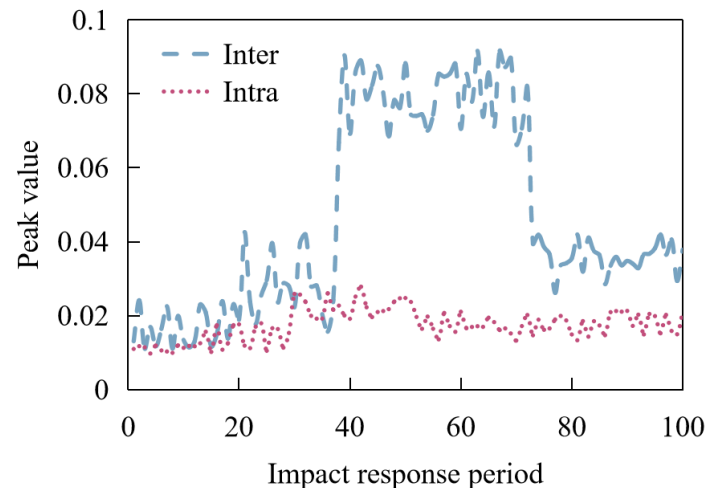

Fig. 4 - Impact response function diagram

For a new impact of foreign capital dependence in the current period, the response value of sulfur dioxide emissions in the first 20 periods was small. The sulfur dioxide emissions increased slowly, and the growth rate accelerated from the 40th period to the 50th period and then increased extremely slowly from the 80th period to the 90th period. There was a slight decline from the 90th to the 100th period, but the range was very small. On the whole, the change from the 50th to the 100th period was very small, which was relatively stable. From the cumulative response value of sulfur dioxide emissions caused by the impact of foreign trade dependence and foreign investment dependence in the whole response period, the influence of foreign trade dependence on pollution emissions is relatively large. In contrast, that of foreign investment dependence is much smaller.

It can be inferred that the increase in dependence on foreign trade will aggravate China's environmental pressure, and its negative effects are constantly increasing. Still, this trend is gradually slowing down in the later period. That is, the impact of foreign direct investment on environmental pollution is smaller than that of import and export trade. There is a long-term stable equilibrium relationship among the variables. The increase in imports can reduce the emission of industrial sulfur dioxide to a certain extent, which is beneficial to the environment. In contrast, the increase in exports will bring more industrial sulfur dioxide emissions, which will worsen our country's environment, consistent with our theoretical analysis.

Regulatory effect of legal text

According to the model fitness analysis and the preliminary hypothesis test results, the original model is adjusted to construct a reasonable model with fitness up to standard. The difference between the alternative and original models is that there is no direct relationship between environmental participation and green purchase intention in the optimized alternative model. The alternative model is a complete intermediary model composed of green purchase attitude and environmental self-efficacy as intermediary variables. On this basis, continue to analyze the relationship among environmental participation, green buying attitude, environmental self-efficacy and green buying intention in different groups. The analysis results are shown in Figure 5.
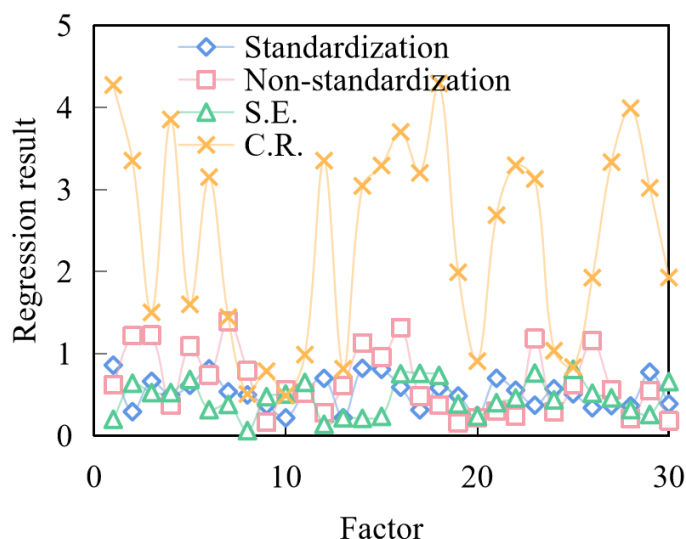
Fig. 5 - Regression analysis results

It can be seen that, without any emotional stimulation, environmental participation at the significance level of 0.05 has a significant positive impact on green purchasing attitude and environmental self-efficacy, green purchasing attitude has a positive impact on green purchasing intention, and environmental self-efficacy has a positive impact on green purchasing intention. The standardization effect of environmental participation on environmental self-efficacy indicates that positive emotions can regulate the positive relationship between environmental self-efficacy and green purchasing intention.

See Table 4 for a summary of the regulatory effects of legal texts on public emotional perception. As can be seen from Table 8, compared with negative emotions, positive emotions have a greater impact on green buying behavior, both in the two dimensions of buying green products and resisting non-green products.

Table 4

The moderating effect of legal texts on Public emotional Perception

Path description	Direct influence effect	Indirect influence effect	Total influence effect
Emotion → Buying Green Products	0.53575	0.00803	0.0684
Negative emotions → Buying green products	0.35919	0.01892	0.34878
Positive Emotion → Resist Non-Green Products	0.21096	0.00544	0.35766
Negative emotions → Resistance to non-green products	0.41975	0.03665	0.42338

This study holds that cognition is shallow, transient and low-involved, while emotion is profound, persistent and high-involved. It significantly regulates two paths: income positive emotion → buying green products and positive emotion → resisting non-green products.

Emotion is more conducive to expanding people's attention, cognition and behavior, enabling individuals to obtain and analyze information more effectively and make more appropriate action choices.

It also has the long-term and sustained effect of enhancing personal resources, such as strengthening people's physical strength, intelligence, psychological adjustment ability and social coordination. From a qualitative point of view, taking behavioral externalities as the criterion, buying green products can increase the positive externalities of behaviors, while resisting non-green effects can reduce the negative externalities of behaviors.

Regardless of the differences between different types of positive emotions, first examine consumers' general reaction to the overall positive emotions. Table 5 lists Pearson correlation coefficients of perceived green efficacy, perceived green responsibility, green buying behavior, emotional arousal and moderate values.

Table 5

Correlation test between different variables

	Mean value	Standard deviation	Perceived green efficacy	Perceived green responsibility	Green purchasing behavior	Emotional arousal degree	Mean values
Perceived green efficacy	5.67101	1.84112	1				
Perceived green responsibility	5.50558	1.40546	0.638	1			
Green purchasing behavior	5.20061	1.56629	0.701	0.668	1		
Emotional arousal degree	5.73771	1.82754	0.441	0.504	0.638	1	
Mean values	5.62312	1.59013	0.739	0.619	0.641	0.618	1

It can be found that under the test level of 0.01, consumers' perceived green efficacy, perceived green responsibility, green buying behavior, emotional arousal and moderate values are significantly positively correlated. Among them, the R value of perceived green effectiveness and green purchasing behavior is 0.701, and the R value of perceived green responsibility and green purchasing behavior is 0.638, which indicates that the degree of correlation between perceived green efficacy, perceived green responsibility and green purchasing behavior is highly correlated.

To sum up, there is no significant difference in the perceived green efficacy of different positive emotions, but there are substantial differences in perceived green responsibility and green buying behavior; hypothesis 1 is not true, and hypotheses 2 and 3 are true. See Figure 6 and Figure 7 for the comparison of specific intuitive mean values. Yearning is higher than the average of other positive emotions.
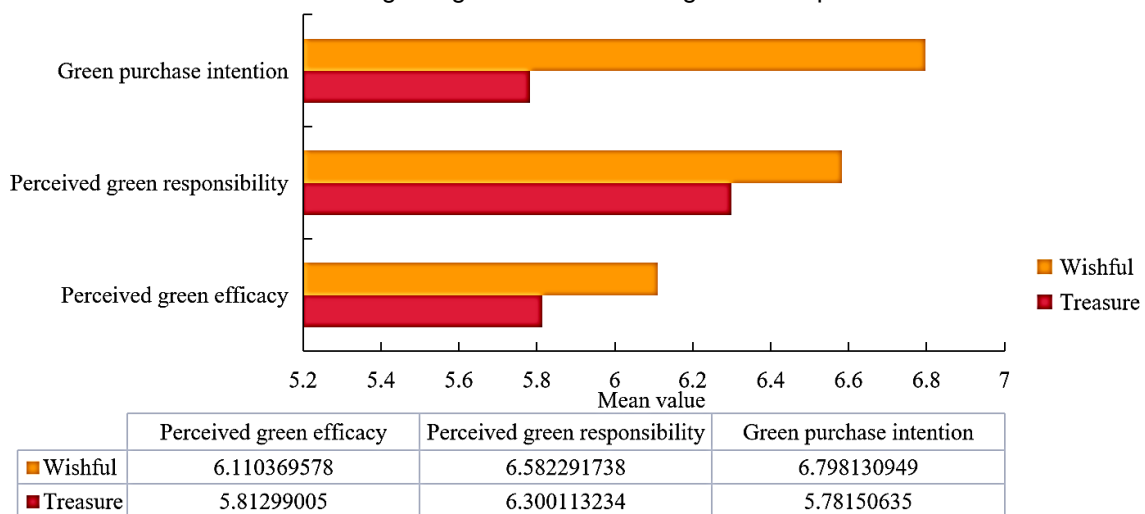

	Perceived green efficacy	Perceived green responsibility	Green purchase intention
Wishful	6.110369578	6.582291738	6.798130949
Treasure	5.81299005	6.300113234	5.78150635

Fig. 6 - Comparison of the mean values of different positive emotions

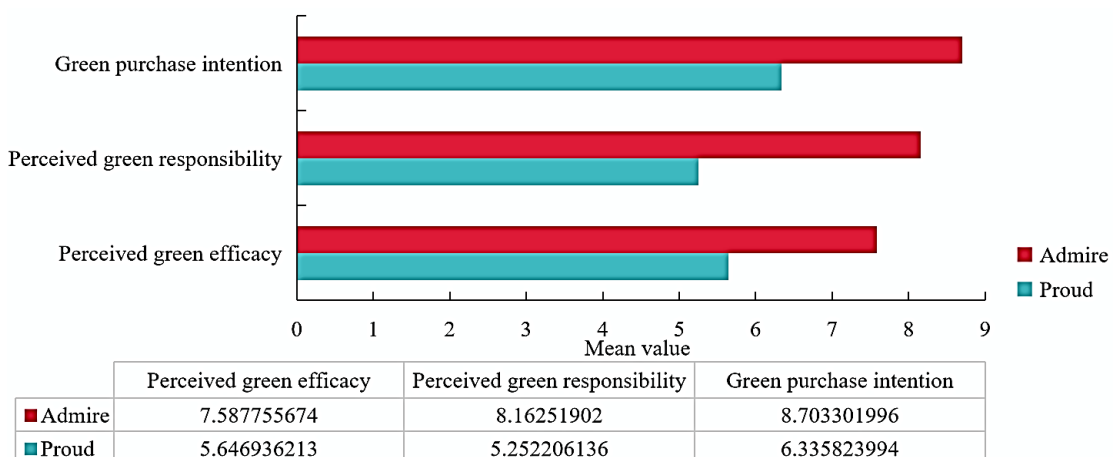|	Perceived green efficacy	Perceived green responsibility	Green purchase intention
Admire	7.587755674	8.16251902	8.703301996
Proud	5.646936213	5.252206136	6.335823994

Fig. 7 - Comparison of the mean values of different positive emotions

Pride and appreciation are the same in consumers' perceptions of green effectiveness. Still, there are substantial differences between pride and gratitude in the perception of green responsibility and green purchasing behavior. When analyzing the four positive emotions, different levels of emotional arousal will affect consumers' perception of green efficacy, green responsibility and green purchasing behavior; Compared with consumers with low arousal, consumers with high arousal can produce higher perceived green effectiveness, perceived green accountability and green purchasing behavior. That is to say, consumers with higher emotional arousal have higher perceived green energy, perceived green responsibility and green purchasing behavior, and differences in perceived green efficacy, perceived green responsibility, and green purchasing behavior can also be generated by different degrees of moderate values.

To show the influence of the relationship strength between nodes on the public conditional green purchasing behavior more straightforwardly, this section adds two modes: the relationship strength and the behavior potential difference for comparative analysis. In a random relational network, the relational power of all nodes in the network is randomly selected between (0,1). By analyzing the diffusion trend of public conditional green buying behavior and network equilibrium, it can be seen that in the consumption network under the weighted small-world network structure, using the potential difference priority mode to select the sender whose conditional green buying behavior diffuses with the receiver will make the conditional green buying behavior selection of all individuals in the network be optimized quickly.

According to the previous empirical results, the positive and negative moderating effects of the perceived effectiveness of environmental protection behavior on the three paths coexist, and the positive moderating effect is obviously higher than the negative moderating effect. As can be seen from Figure 8, at the initial stage of simulation, whether in random mode, intensity priority mode or potential difference priority mode, the average level of conditional green purchasing behavior in the network has increased slightly with the enhancement of the perception of the effectiveness of environmental protection behavior, but the network balance has deteriorated.
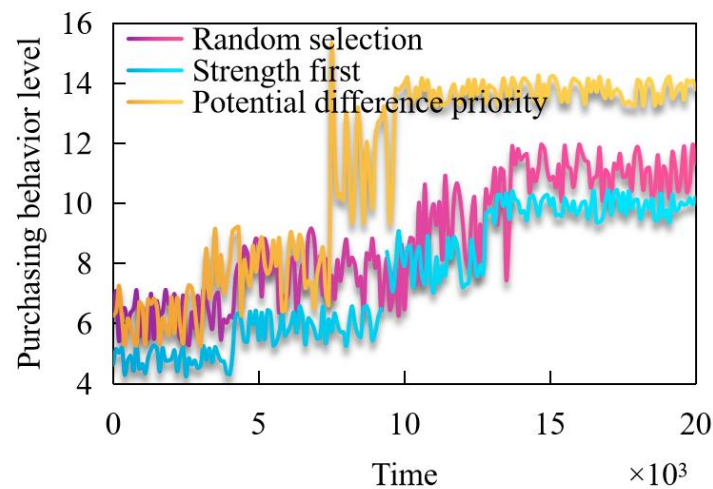

Fig. 8 - The changing trend of conditional green purchasing behavior under the intervention of environmental protection effectiveness perception

In addition, in the early stage of simulation, the variance of conditional green purchasing behavior of all nodes in the network in different modes drops rapidly. It enters a channel of steady decline in the middle and late stages. At the same time, the network balance begins to show signs of optimization, and the network balance in the strength priority mode and the potential difference priority mode is equivalent.

As can be seen from Figure 9, after the government's environmental protection investment intervention, the individual conditional green purchasing behaviors in the network all show a downward trend, and the network balance becomes worse. At the initial simulation stage, the growth rate of the potential difference priority mode is higher than that of the intensity priority mode. With the increase of the simulation step, the growth rate of the behavior of the two modes approaches and the number of individuals with "poor conditional green purchasing behavior" becomes smaller and smaller.
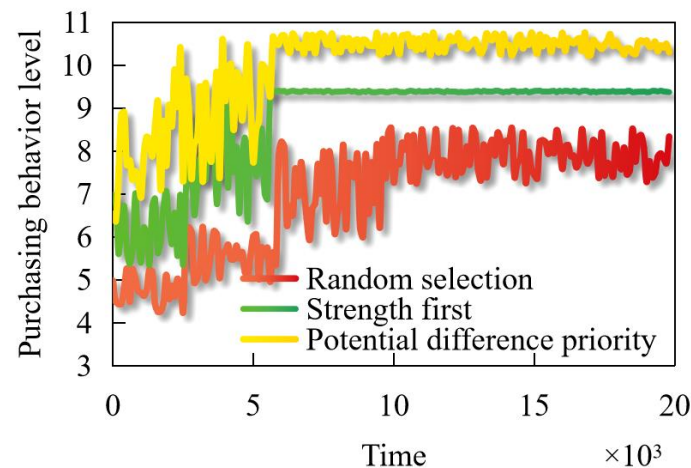
Fig. 9 - Change trend of conditional green purchasing behavior under the intervention of government environmental protection investment

From the increment of conditional green purchasing behavior in the simulation process, the diffusion of conditional green purchasing behavior in the potential difference priority mode is weakly interfered with by the government's environmental protection investment, and the network balance is relatively good. The network balance also worsens. At the middle and late stage of the simulation, the average conditional green purchasing behavior of all individuals in the network began to increase slightly. At the same time, in the initial simulation stage, the variance of conditional green purchasing behavior of all nodes in the strength priority mode and potential difference priority mode network decreased sharply. Still, the network balance became worse, And the random pattern is the smallest. From the variance of network nodes' conditional green purchasing behavior, under the potential difference priority mode, when the urban noise pollution takes the value of 7, the variance of all nodes' dependent green purchasing behavior decreases the most in the middle and late period, and the network balance is achieved as quickly as possible.

The level of consumer ethnocentrism and conformity psychology directly impact the purchase intention of foreign products. The total effects of consumer ethnocentrism, attitude towards foreign products, the impact of country of origin and conformity psychology on the purchase intention of foreign products have all passed the parameter significance test. The quality of consumers' perception of foreign products and their willingness to buy depend largely on the above three factors. The country-of-origin effect has the greatest influence on the perceived quality of foreign products. In addition, domestic enterprises should actively seek ways to establish joint ventures with developed countries while introducing alien advanced technology and learning from foreign advanced manufacturing technology and management experience to improve product quality and technical content.

A country's optimal strategic environmental tax rate is always lower than its domestic marginal environmental damage; the government is motivated to implement environmental dumping to help domestic enterprises make profits. Try to improve the comprehensive utilization rate of wastewater, gas and waste materials in enterprises, comprehensively utilize all kinds of construction and industrial wastes, and comprehensively consider the recycling of urban domestic sewage and the resource utilization of household wastes. Emotion is the psychological reaction of consumers. When consumers experience an intimate and pleasant experience in purchasing, they are more likely to stimulate their desire to buy. Therefore, green food manufacturers should communicate and communicate with consumers from the perspective of consumers when conducting related marketing activities. They can be more willing to pursue a healthier, more scientific and more civilized way of consumption. Therefore, when green products are given environmental protection characteristics, they are more able to meet consumers' needs, and they are willing to make green purchases.

CONCLUSIONS

This paper constructs a theoretical hypothesis model to explore the moderating effect of policy and legal texts on the relationship between public emotional perception of environmental policies and trade in green products. After an empirical test, all the research hypotheses of this study are supported. It is found that the development of international trade inhibits the emissions of these two environmental pollution indicators and has a significant role in promoting environmental quality.

The increase in dependence on foreign exchange will aggravate the pressure on China's environment, and its negative effects are constantly increasing. Still, this trend is gradually slowing down in the later period. This study holds that cognition is shallow, transient and low-involved, while emotion is profound, persistent and high-involved. From a qualitative point of view, taking behavioral externalities as the criterion, buying green products can increase the positive externalities of behaviors, while resisting non-green effects can reduce the negative externalities of behaviors. When the value of urban noise pollution is 7, the variance of conditional green purchasing behavior of all nodes decreases the most in the middle and late periods, and the network balance is achieved as soon as possible.

COMPETING OF INTERESTS
The authors declare no competing of interests.

AUTHORSHIP CONTRIBUTION STATEMENT
Guoli Han: Writing-Original draft preparation, Conceptualization, Supervision, Project administration.
Shuming Ma: Methodology, Software, Validation.

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