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Research Article

The Game and Impetus Analysis of Ecological Enrichment of Corporate Citizens

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Ecological enrichment is not the growth of the economic value of a business entity and the use of surplus to fund deficits, but the coordinated growth of corporate citizens' ecological value and economic value, which is conducive to the positive evolution of ecological beauty and economic vitalization. Through the game model, this paper makes a game analysis of various possibilities of the game of ecological enrichment and further gives a balanced solution to the impetus of ecological enrichment. Positive-sum return, return equilibrium, and dynamic equilibrium are all the necessary conditions for the positive selection of repeated games for corporate citizens' ecological enrichment and play a decisive role in the impetus of ecological enrichment.

1. Introduction

Ecological enrichment corresponds to a beauty economy, that is, a beautiful ecological environment and high flow and wealth stock. Ecological enrichment is high-quality development and a distinctive feature of a double carbon economy and harmonious economy in the new era. Ecological enrichment guided by ecological value in post rich areas (coincrease of ecological value and economic value) is conducive to giving full play to the ecological value advantage of post rich areas, solving the reverse evolution of economic value and ecological environment and promoting the positive evolution of beauty and economy, to achieve the dual long-term goals of beautiful China (double carbon) and rural vitalization (common prosperity).

2. Ecological Enrichment and Its Impetus

2.1. Ecological Enrichment and Its Superiority. Compared with the goal of double carbon and common prosperity, low-quality development has two limitations: firstly, the process of economic value growth in post rich areas is a process of pollution transfer. The economic value and the ecological environment evolve in an opposite direction, causing the post rich areas to fall into the trap of environmental pollution with an upturn in the economy and sacrifice ecological beauty for economic growth, in which the cost of pollution transfer goes against the original intention of development; secondly, the process to fund deficits with the surplus of economic value in post rich areas is a process of value transfer. The use of surplus to fund deficits, regardless of transfer payment of wealth or preferential allocation of resources, belongs to wealth granting and does not create any wealth by itself. And the longer the principal-agent chain, the higher the dissipative value of wealth in funding deficits with a surplus, and the lower the effectiveness. [1].

To achieve the goal of double carbon and common prosperity, it is necessary to reconstruct the evolutionary relationship between GDP (economic vitalization, which corresponds to low-quality development) and GEP (gross ecosystem product, which corresponds to ecological enrichment). Ecological Enrichment, also known as ecological value-oriented vitalization, refers to giving full play to the ecological value advantages of the post rich areas, transforming the role of business entity to the corporate citizen, realizing the positioning of the ecological industry chain and ecological value chain, and realizing the coordinated growth

of ecological value and economic value, to achieve the win-win goal of ecological beauty and wealth creation teaching. [2].

The two advantages of ecological enrichment make up for the two limitations of low-quality development well: firstly, on the basis of preserving ecological enrichment and giving full play to the ecological value advantages of the post rich areas, material civilization and ecological civilization of the post rich areas evolve in the same direction, avoiding the transfer of pollution; secondly, ecological enrichment does not mean using the surplus of economic value to fund deficits; instead, it realizes the positive correlation and evolution between economic value and ecological value, while teaching how to get rich, with the positioning of ecological industry chain and ecological value chain. In addition, ecological enrichment is conducive to the realization of the long-term goal of harmony between man and man and harmony between man and nature of a community of shared future for mankind. So, ecological enrichment of ecological value-oriented is equal to the ecological revitalization of environmental value-oriented + rural revitalization of economic value-oriented, which has more economic value than ecological revitalization and more environmental value than rural revitalization.

2.2. Impetus of Ecological Enrichment. The subject of environmental enrichment is enterprises, which, by dichotomy, are divided into the business entity and corporate citizens. From the perspective of the human nature hypothesis, business entity refers to the economic man taking economic value as guidance to pursue the goal of maximizing economic value (prioritizing profit rate and taking into account the amount of profit) of self-worth; corporate citizens refer to the self-actualizing man and social man taking ecological value as guidance to pursue the goal of maximizing ecological value (prioritizing economic value and taking into account the environmental value) of stakeholders. Corporate citizens are the first business entity, which has positive externalities. At the same time, corporate citizens are social men and should avoid negative externalities [3].

2.3. Impetus Theory of Ecological Enrichment. Contract Theory analyzes the impetus of ecological enrichment from the perspective of written contracts and psychological contracts. The written contract corresponds to the rigid impetus of ecological enrichment, while the psychological contract corresponds to the flexible impetus of ecological enrichment. Utilitarianism analyzes the impetus of ecological enrichment from the perspective of pursuing "the greatest happiness" and holds that the impetus of ecological enrichment depends on whether the choice of environmental enrichment can bring corporate value, namely, whether the marginal benefit is greater than marginal cost. The theory of human nature assumption includes four human nature hypothesis such as economic man, self-actualizing man, social man, and complex man hypothesis, which analyzes the impetus of ecological enrichment from different human nature assumptions. For example, the economic man assumption implies that human nature is evil, which corresponds to the impetus of a business entity. Self-actualizing man assumption implies that human nature is good, and social man assumption implies that human nature is group identity, corresponding to the mission impetus of corporate citizens. Stakeholder theory studies the impetus of ecological enrichment from the diversified enterprise goals and holds that enterprises, customers, employees, government, and other stakeholders pursue different interest goals, such as enterprise value maximization, customer value maximization, employee value maximization, ecological value maximization, and so on. The multiple goals of stakeholders jointly determine the combined impetus of corporate citizens' ecological enrichment [4]. Generally, the theory of human nature hypothesis is the theory that best determines the impetus of ecological enrichment.

2.4. Definition of Impetus of Ecological Enrichment. The impetus of ecological enrichment comes from corporate niche, the more favorable the chosen ecological enrichment is to the material or spiritual niche of an enterprise, the greater the impetus of ecological enrichment. The physical niche corresponds to an explicit written contract and determines the rigid impetus of ecological enrichment, and the spiritual niche corresponds to an implicit psychological contract and determines the flexible impetus of ecological enrichment. At the same time, the corporate niche is influenced by both the external public among the stakeholders and the internal public, so the impetus of environmental enrichment can be divided into external impetus and internal impetus. As a result, ecological enrichment has four impetuses, that is, an external rigid impetus (third-party coercive impetus), an external flexible impetus (third-party ethical impetus), an internal rigid impetus (economic impetus of business entity), and an internal flexible impetus (mission impetus of corporate citizens) [5].

3. Game Analysis of Ecological Enrichment

3.1. Ecological Industry Chain and Ecological Value Chain. From the perspective of positioning among businesses, enterprises achieve ecological enrichment mainly by positioning the ecological industry chain. The analyses on environments (macro environment, industrial environment, and competitive environment), missions (corporate citizens' ecological value mission and business entities' economic value mission), and strengths (corporate resources and corporate value chain) jointly determine the positioning of the corporate ecological industry chain. In the practice of positioning among businesses, there are two game strategies, positioning the economic industry chain of business entities and positioning the ecological industry chain of corporate citizens [6].

From the perspective of positioning internal business, enterprises achieve ecological enrichment mainly by positioning the ecological value chain. The four links, including green research and development (dark green technology and light green technology), green production (clean production

and virtual production), green marketing (green logistics and network direct marketing), and green brand (low-carbon certification and ecological brand), jointly constitute the ecological value chain positioning of enterprises. In the practice of positioning internal business, there are two game strategies, positioning the economic value chain of business entities and positioning the ecological value chain of corporate citizens [7–9].

In the practice of ecological enrichment game, the choice of ecological enrichment not only depends on the expected return of individuals, but also depends on the influence of the expected return of individuals from other enterprises choosing or not choosing ecological enrichment in post-rich areas. In the theory of ecological enrichment game, the game and impetus of ecological enrichment of corporate citizens are the cooperation-competition game and impetus positioning of ecological industry chain and ecological value chain.

3.2. Game Model Hypothesis and Element Definition. In order to construct the game model, the following four assumptions are made:

(1) The total number of players in the post rich areas who choose or do not choose ecological enrichment is N.

(2) Player choosing ecological enrichment strategy means corporate citizens in the post rich areas implement the positioning of the ecological industry chain and ecological value chain, and the player not choosing ecological enrichment strategy means business entities in the post rich areas implement the positioning of the economic industry chain and economic value chain.

(3) With the increase of the number M of the players in the post rich areas who choose ecological enrichment, namely, positive selection, the expected return of corporate citizens shows an increasing trend, and the positive selection return curve PS inclines upward to the right.

(4) With the increase of the number N-M of the players who do not choose ecological enrichment, namely, adverse selection, the expected return of business entities shows a decreasing trend, and the adverse selection return curve AS inclines downward to the left.

Based on such assumptions, "PARTS," the five elements of ecological enrichment game are defined as follows: Player refers to the rational decision-making subject that takes its own value maximization as the criterion, that is, all the enterprises in the post rich areas that choose or do not choose ecological enrichment. Added values refer to the economic or ecological value added by the game choice, that is, the achievement of the dual goals of maximum corporate value and maximum ecological value by the player by choosing ecological enrichment. Rules refer to the game decision procedure and value allocation agreement, that is, the distribution of benefits or risks corresponding to added value by players according to written contracts and psychological contracts. Tactics means the specific decision method game choice, that is, the players establish a common vision and choose ecological enrichment, or they do not trust each other and do not choose ecological enrichment. Scope refers to the quantitative boundary of each element of the game, that is, the industry chain scope, game time, game times, and other conditions of the players in ecological enrichment game.

3.3. Game Model Analysis. Among the five elements of an ecological enrichment game, the change of any element may lead to different strategies for the players. The following is an analysis of various game possibilities of ecological enrichment in post rich areas.

3.3.1. Smooth Slope Model. Figure 1 is a smooth slope model. N is the number of players in the post rich areas, M is the number of players making a positive selection, N-M is the number of players making an adverse selection, and the vertical axis represents the expected return of positive or adverse selection. Positive selection return curve PS inclining upward to the right and adverse selection return curve AS inclining downward to the left cannot make the players in the ecological enrichment game be motivated by positive selection or tempted by adverse selection. When the expected return of the players' adverse selection exceeds that of their positive selection, the curve PS is located below the curve AS, and at this time, the players may collectively make an adverse selection to obtain higher returns.

In the game practice of ecological enrichment in post rich areas, many situations will lead to smooth slopes. For example, due to the change in the macro environment and industry environment, the dual goal of maximizing enterprise value and ecological value (added value change) cannot be achieved by choosing ecological enrichment; there are many disputes about the expected return and risk distribution of environmental enrichment in the written contract or psychological contract, or the information of positive and adverse selections is asymmetric (rules misleading); the players use each other rather than trusting each other and have different views on the expected return and the prospect of choosing ecological enrichment (tactical loopholes); in the process of choosing ecological enrichment, the variables such as the industry chain scope, game time, and game times of players change (scope variables). Because the return of point F is higher than that of point B, curve AS is the rational choice of players, and the collective adverse selection of players eventually leads players to slide down the smooth slope to point E of curve AS [10]. In the smooth slope model of ecological enrichment, the players can obtain a higher expected return from adverse selection than that from positive selection, and the number of players who choose ecological enrichment declines along the smooth slope, ultimately causing ecological enrichment only with slogans and lacking motivation.

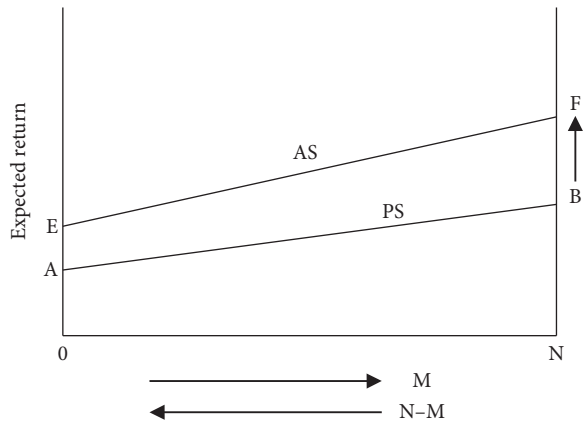

Figure 1: Smooth slope model.

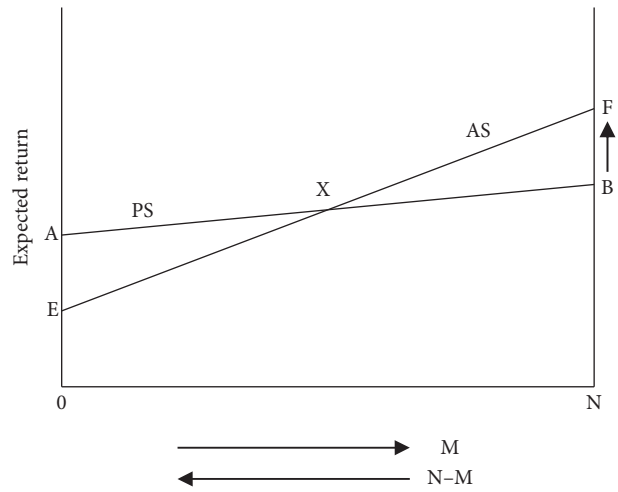

Figure 2: Self-resistance slope model.

3.3.2. Self-Resistance Slope Model. Figure 2 is a self-resistance slope model. The differences from Figure 1 are that the expected return of adverse selection decreases and adverse selection return curve AS moves down, intersecting with the positive selection return curve PS at point *X*; the lowest point A of curve PS is higher than the lowest point *E* of curve AS, and the highest point B of curve PS is lower than the highest point F of curve AS. On the right side of point *X*, the return of point F is higher than that of point B, indicating that adverse selection is the best policy for the players; on the left side of point *X*, the return of point A is higher than that of point *E*, indicating positive selection is the best policy for the players. In the self-resistance slope model of ecological enrichment, the written contract and psychological contract of ecological enrichment cannot effectively restrain every player, and point *X* instead of point B (the optimal scale boundary) becomes the scaled boundary of the number of players making the positive selection.

In the game practice of ecological enrichment, compared with oligopoly industries with a small number of players, monopolistic competitive industries with a large number of players face more uncertainties of the returns from choosing ecological enrichment with the increase in the number of players, and some players may make an adverse selection to reach the critical scale boundary at point X. The self-resistance slope can be set by "PARTS" to change the expected return of choosing ecological enrichment and that of not choosing ecological enrichment, so that the number of players not choosing ecological enrichment will be blocked at a certain number, instead of falling completely or even bringing the strategy of choosing ecological enrichment to collapse [11–13]. When curve AS slides down to point *X*, the choice of ecological enrichment will become favorable, and the dominant strategy of the players will change to choosing ecological enrichment from not choosing ecological enrichment. In the self-resistance slope game, when an adverse selection strategy occurs at point *X*, the initiator of ecological enrichment can strengthen the external negative reinforcement of adverse selection through the setting of the five elements of the ecological enrichment game, so as to prevent the probability of adverse selection by the players and move point *X* to the right. In the Internet + era, external positive reinforcement or negative reinforcement can be made to rectify deviations, prevent the self-resistance slope from becoming a smooth slope, and increase the rightward displacement scale of point *X* of the self-resistance slope model and thus increase the number of corporate citizens who choose ecological enrichment in post rich areas.

3.3.3. Viscous Slope Model. Figure 3 is a viscous slope model. The differences from Figure 2 are that the positive selection return curve PS and adverse selection return curve AS exchange their places. The best collective policy of the players is at point B of curve PS. On the left side of *X*, the expected return of choosing ecological enrichment is less than that of not choosing ecological enrichment, and players show a trend of the smooth slope. On the right side of point *X*, the expected return of choosing ecological enrichment is greater than that of not choosing ecological enrichment, and at point B, players are motivated to collectively make a positive selection, avoiding the vicious slope from becoming a smooth slope.

In the game practice of ecological enrichment, if a certain number of players choose ecological enrichment in post rich areas, ecological enrichment will enter a virtuous cycle and the expected return of players from choosing ecological enrichment will be greater than that from not choosing ecological enrichment; however, if the certain number is not reached, the ecosystem of ecological enrichment will not enter a virtuous cycle and the expected return of players from not choosing ecological enrichment will be greater than that from choosing ecological enrichment.

By "PARTS" setting, the initiator of ecological enrichment can make the return from positive selection greater than that from adverse selection and correct adverse selection motivation. When players collectively strive for point B, ecological enrichment becomes a rational solution. However, before the rational expectation of choosing

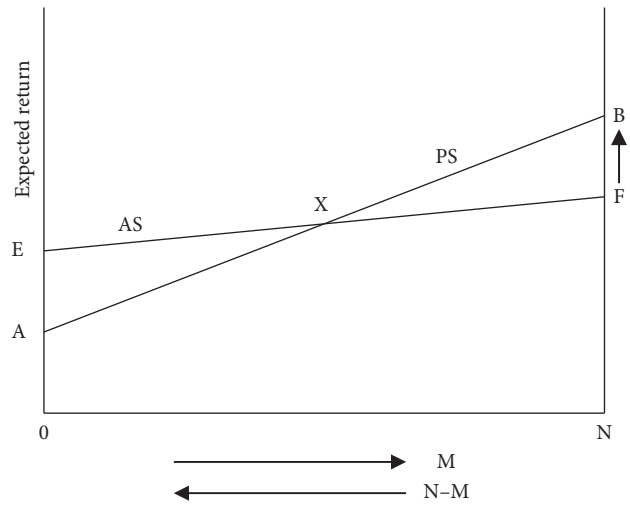

Figure 3: Viscous slope model.

ecological enrichment is established, if the ecological value chain has nothing to do with enterprise income or the positive selection suffers a loss, players will be tempted to abandon the income at point A and choose the income at point *E*, and finally all players make an adverse selection. In the vicious slope model, the turning point of the game is the critical number of players choosing ecological enrichment; when it is less than the critical number, players will pursue the range of not choosing ecological enrichment at the left side of point *X*; when it is larger than the critical number, players will pursue the range of choosing ecological enrichment at the right side of point *X* [14–16].

3.3.4. Cycle-Step Model. Figure 4 is a cycle-step model. From point A, the expected return from choosing ecological enrichment is greater than that from not choosing ecological enrichment, to choose ecological enrichment is a dominant strategy taken by players, and positive selection return curve PS controls adverse selection return curve AS. When reaching point B where curve AS and curve PS intersect, the expected return from choosing ecological enrichment changes in direction, and the return of curve AS is greater than that of curve ps (curve ps and curve PS have opposite expected returns). At point B, curve AS becomes a smooth slope and players slide down to point A. The cycle step starts from point A and the expected return from the positive selection is solid line PS; if the cycle step starts from point B, the expected return will become dotted line ps. In the cycle-step game model, the apex of positive selection is the beginning of adverse selection when the expected return from choosing ecological enrichment changes in direction [17].

In an ecological enrichment game, players are always rational and believe that the other parties are rational too. Under the conditions of repeated games and failure of external correction, if a player makes an adverse selection before ending the last cooperative game, the strategy of "Like for Like" fails, at least for this game. The group game logic of players is the same as that of the individual game: each game is subject to reverse reasoning, the best strategy taken by players in the group game

		Enterprise B	
		Not choose	Choose
Enterprise A	Not choose	0, 0	$0, -I_0\lambda_2$
	Choose	$-I_0\lambda_1, 0$	$£¨P_0 - I_0£\lambda_1©, £¨P_0 - I_0£\lambda_2©$

Figure 4: Static game return matrix of ecological enrichment.

is to make an adverse selection from the first game and players may be trapped in the cycle steps if they choose ecological enrichment. Therefore, in order to prevent the opposite party's adverse selection in the last round of the ecological enrichment game, each player may cause the positive selection to fall short. In the practice of ecological enrichment, the policies of economic vitalization and ecological enrichment alternate with each other, and ecological enrichment is often trapped in cycle steps in case of regional transfer and protection of polluting enterprises. The initiator of ecological enrichment should adjust the group expectation when the expected return of environmental enrichment is likely to reverse (at point B), so as to avoid the failure of positive selection.

4. Impetus Analysis on Ecological Enrichment

According to the game analysis on ecological enrichment, the initiator of ecological enrichment should adjust the five-game elements. Only when the expected return of game parties from the positive selection is greater than that from adverse selection, will the parties be motivated to make ecological enrichment, and then the strategy of ecological enrichment will enter a virtuous circle. So that the relationship between the game analysis and impetus analysis of environmental enrichment is that before there is the impetus of ecological enrichment, there will be the revenue increment by the rational game analysis of ecological enrichment. All parties in the ecological enrichment game seek to maximize their returns, which include not only short-term return and absolute financial income but also long-term income and relative competitiveness. Especially when game parties of ecological enrichment are in a competitive or potential competitive relationship, knowing each other under repeated games that the positive feedback and negative feedback laws will lead to the increase and decrease of the returns and the competitiveness. Therefore, game players of ecological enrichment not only pay attention to the absolute returns of ecological enrichment but also pay more attention to its relative returns [18]. The following is a balanced solution to the impetus of ecological enrichment from the perspective of the absolute return of static game and the relative return of dynamic game, respectively.

4.1. Static Impetus of Ecological Enrichment

4.1.1. Static Game Assumption. In order to construct a static game return matrix of ecological enrichment, the following two assumptions are made:

(1) There are only two enterprises, A and B, in post rich areas, which play a game or repeated games under the condition of constant relative competitiveness

(2) When these two enterprises obtain positive-sum total returns from ecological enrichment (namely $1 + 1 > 2$), they distribute the returns according to the proportion of resources invested in ecological enrichment

4.2. Static Impetus Equilibrium. Figure 5 is the static game return matrix of players' ecological enrichment. In a static game, the players' return function has nothing to do with the relative return gap. I_0 is the total investment in ecological enrichment; P_0 is the total returns of enterprises A and B from ecological enrichment; λ_1 and λ_2 are, respectively, the proportion of the agreed investment (distribution) of enterprises A and B in ecological enrichment to the total investment (total return), $\lambda_1 + \lambda_2 = 1$, and suppose $\lambda_1 \neq \lambda_2$. Among the two pure-strategy Nash equilibriums of the static return matrix, the lower right corner of Figure 5 where they both choose ecological enrichment is the positive-sum total return, which is the only pure-strategy Nash equilibrium [19]. In ecological enrichment practice, the greater the absolute return in the lower right corner of the return matrix, the more motivated players are to choose ecological enrichment.

4.3. Dynamic Impetus of Ecological Enrichment. Figure 5 is the dynamic game return matrix of players' ecological enrichment. In a dynamic game, the players' return function is related to the relative return gap. Industry correlation coefficient of players is δ ($\delta \in [0,1]$); P_1 and P_2 are, respectively, the returns of Enterprise A and B from ecological enrichment: $P_1 = P_0\lambda_1 + (\lambda_1\text{-}\lambda_2)\, P_0\delta\text{-}I_0\lambda_1$ and $P_2 = P_0\lambda_2 + (\lambda_2 - \lambda_1)\, P_0\delta - I_0\lambda_2$. In the dynamic return matrix, there are two pure-strategy Nash equilibriums too, and the lower right corner where they both choose ecological enrichment is a deterministic solution. Because the conditions of the deterministic Nash equilibriums where they both choose ecological enrichment are $P_1 \geq 0$ and $P_2 \geq 0$, the conditions under which the investment allocation ratio meets ecological enrichment demand are worked out, namely,

$$\lambda_2 \geq \frac{P_0\delta}{P_0 - I_0 + 2P_0\delta}. \quad (1)$$

By setting the return on investment in ecological enrichment as α, $P_0 = I_0(1 + \alpha)$, equation (1) can be further simplified, namely,

$$\lambda_2 \geq \frac{\delta}{\alpha/1 + \alpha + 2\delta}. \quad (2)$$

Four deductions can be drawn from equation (2): (1) when the industry correlation coefficient δ is constant, players can adjust the investment (distribution) ratios λ_1 and λ_2 through contract or external correction, so as to establish the condition equation of environmental enrichment and motivate all players to make ecological enrichment; (2) when

Enterprise A \ Enterprise B	Not choose	Choose
Not choose	0, 0	$0, -I_0\lambda_2$
Choose	$-I_0\lambda_1, 0$	P_1, P_2

Figure 5: Dynamic game return matrix of ecological.

δ is constant, the greater the return on investment α, the higher the positive-sum returns of group game, and the greater the incentive for players to make ecological enrichment; (3) when δ and α are both constant, the larger the investment (distribution) ratio of an enterprise λ, the greater the incentive for an enterprise to make ecological enrichment; and (4) when δ, α,and λ are all constant, the bigger the relative return gap of an enterprise which is beneficial to itself, the greater the incentive for an enterprise to make ecological enrichment.

The same is true for repeated game analysis of ecological enrichment by multiple enterprises. In order to motivate the enterprises in the same or different industries and areas rich after foreign aid (wealth creation teaching) to make ecological enrichment in the process of dynamic repeated games, we should not only consider the equilibrium of absolute return distribution among players but also consider the adverse impact of the relative return gap on the impetus of ecological enrichment. The impetuses of ecological enrichment include static and dynamic impetus. The static impetus corresponds to positive-sum return and returns equilibrium, is the game source impetus, and is the single game impetus of ecological enrichment. The dynamic impetus corresponds to dynamic equilibrium, which is the repeated game impetus of ecological enrichment [20].

5. Conclusions

(1) Ecological enrichment is not the growth of economic value or the use of surplus to fund deficits, but the positioning of the ecological industry chain and ecological value chain and the dual achievement of ecological value and economic value. Contract, stakeholder, human nature hypothesis, and other theories should be jointly taken into account in defining the four impetuses of ecological enrichment: internal, external, voluntary, and compulsory. Generally, the four composite impetuses are the impetus for the ecological enrichment of corporate citizens.

(2) From the perspective of an ecological enrichment game, it is necessary to meet two conditions, including corporate citizens' positive-sum return (return condition) and return equilibrium (contract conditions), only under which can enterprises make a positive selection (choosing ecological enrichment), rather than an adverse selection (not choosing ecological enrichment).

(3) From the perspective of ecological enrichment impetus, it is necessary to meet two conditions, including the growth of corporate citizens' absolute return (static impetus equilibrium) and favorable relative returns (dynamic impetus equilibrium), only under which can enterprises be motivated to make ecological enrichment.

(4) Based on the above two perspectives, three conditions are needed in enhancing the impetus of ecological enrichment: positive-sum return, return equilibrium, and dynamic equilibrium. Positive-sum return is the game source impetus of ecological enrichment of corporate citizens, return equilibrium is the single game impetus of ecological enrichment of corporate citizens, and dynamic equilibrium is the repeated game impetus of ecological enrichment of corporate citizens.

The impetus of environmental enrichment is a complicated system. By establishing the model of the solution and describing the current situation of the solution with an axiomatic approach, the optimal solution of the impetus game of ecological enrichment players can be obtained. As a whole, positive-sum return, return equilibrium, and dynamic equilibrium are all the necessary conditions for the positive selection in the repeated games of environmental enrichment and play a decisive role in the impetus of ecological enrichment. Government citizens and society citizens can rectify the impetus for corporate citizens to make ecological enrichment through external positive reinforcement (ecological subsidies, ecological honor roll, and so on) and negative reinforcement (ecological taxes, ecological blacklists, and so on).

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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References

[1] M. Singhania and N. Saini, "Revisiting environmental degradation and economic growth nexus using autoregressive distributed lag approach," *International Journal of Productivity and Performance Management*, vol. 69, no. 8, pp. 1765–1796, 2020.

[2] F. Capra and O. D. Jakobsen, "A conceptual framework for ecological economics based on systemic principles of life," *International Journal of Social Economics*, vol. 44, no. 6, pp. 831–844, 2017.

[3] R. Zackary Seitz, "Rubber ducks to ecological citizenship: a review of practitioner-oriented research on ecological issues in the social studies," *Social Studies Research and Practice*, vol. 15, no. 3, pp. 261–275, 2020.

[4] U. Tamayo and G. Vargas, "Biomimetic economy: human ecological-economic systems emulating natural ecological systems," *Social Responsibility Journal*, vol. 15, no. 6, pp. 772–785, 2019.

[5] Le Zhang, C. Chen, and C. Zhang, "Research on the driving force of economic growth under the new development pattern of "dual circulation"—based on the perspective of TFP decomposition," *Prices in China*, vol. 35, no. 1, pp. 28–32, 2022.

[6] D. D. Shin, A. Fotiadis, and H. Yu, "Prospectus and limitations of algorithmic governance: an ecological evaluation of algorithmic trends," *Digital Policy, Regulation and Governance*, vol. 21, no. 4, pp. 369–383, 2019.

[7] M. Franco and M. Rodrigues, "Sustainable practices in SMEs: reducing the ecological footprint," *Journal of Business Strategy*, vol. 42, no. 2, pp. 137–142, 2019.

[8] G. Qiao, J. Xu, L. Ding, and Q. Chen, "The impact of volunteer interaction on the tourism experience of people with visual impairment based on a mixed approach," *Current Issues in Tourism*, vol. 14, pp. 1–18, 2022.

[9] Y. Ban, M. Liu, P. Wu et al., "Depth estimation method for monocular camera defocus images in microscopic scenes," *Electronics*, vol. 11, no. 13, 2022.

[10] H. Ajmi, H. Abd Aziz, S. Kassim, and W. Mansour, "Adverse selection analysis for profit and loss sharing contracts," *International Journal of Islamic and Middle Eastern Finance and Management*, vol. 12, no. 4, pp. 532–552, 2019.

[11] S. Yan and X. Cheng, "Recommendation algorithm based on bayesian posterior probability and non-cooperative game," *Computer Applications and Software*, vol. 39, no. 3, pp. 270–276, 2022.

[12] L. Xu, X. Liu, D. Tong, Z. Liu, L. Yin, and W. Zheng, "Forecasting urban land use change based on cellular automata and the PLUS model," *Land*, vol. 11, no. 5, pp. 652–2, 2022.

[13] S. Lu, Y. Ban, X. Zhang et al., "Adaptive control of time delay teleoperation system with uncertain dynamics," *Frontiers in Neurorobotics*, vol. 16, Article ID 928863, 2022.

[14] X. Liu and W. Zhou, "Complex dynamic behavior analysis of two-stage service game model," *Journal of Hebei Normal University (Philosophy and Social Sciences Edition)*, vol. 46, no. 2, pp. 158–166, 2022.

[15] G. Zhang, C. L. Wang, J. Liu, and L. Zhou, "Why do consumers prefer a hometown geographical indication brand? Exploring the role of consumer identification with the brand and psychological ownership," *International Journal of Consumer Studies*, vol. 46, 2022.

[16] L. Zhou, F. Jin, B. Wu, X. Wang, V. Lynette Wang, and Z. Chen, "Understanding the role of influencers on live streaming platforms: when tipping makes the difference," *European Journal of Marketing*, vol. ahead-of-print(ahead-of-print), 2022.

[17] S. Nenonen, J. Gummerus, and A. Sklyar, "Game-changers: dynamic capabilities influence on service ecosystems," *Journal of Service Management*, vol. 29, no. 4, pp. 569–592, 2018.
[18] J. Y. L. Forrest, J. Buttermore, and T. A. Wajda, "At Nash equilibrium when new market competitions appear?" *Kybernetes*, vol. 46, no. 2, pp. 256–271, 2017.
[19] M. Raoufinia, V. Baradaran, and R. Shahrjerdi, "A dynamic differential oligopoly game with sticky price and advertising: open-loop and closed-loop solutions," *Kybernetes*, vol. 48, no. 3, pp. 586–611, 2019.
[20] T. Mariyanti and A. A. Mahfudz, "Dynamic circular causation model in poverty alleviation," *Humanomics*, vol. 32, no. 3, pp. 275–299, 2016.