

Evolutionary game of green manufacturing mode of enterprises under the influence of government reward and punishment

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ABSTRACT

Green production mode is an advanced manufacturing mode. However, due to the environmental externality of green production, it is different for a pure market mechanism to promote the evolution of green operation mode of manufacturing enterprises. Government regulation is very important. This paper establishes an evolutionary game model of whether manufacturing enterprises choose to implement green production mode when the government implements two different mechanisms of reward and punishment. Considering the complexity of strategy selection of enterprises' green production behaviour under market competition, the method constructs the simulation analysis model of enterprises' green product production behaviour with multi-subject participation. We can simulate the influence of these factors on the strategic choice of both parties (enterprises and governments) by changing the different influence factors, and studying the evolutionary law of different government guidance and regulation strategies on the production behaviour of green products. These factors include government incentives, penalties, reputations, costs, differences in the cost of implementing green production on the corporate side, corporate reputation, and false rewards or penalties. By the computer implementation of multi-subject modelling, the results show that enterprises' green product production behaviour needs the government's guidance and regulation. When formulating relevant policies, the government should combine various guidance and regulation strategies and fully consider the influence of market competition.

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Evolucijska igra za preučevanje zelene usmeritve proizvodnih podjetij pod vplivom vladnih nagrad in kazni

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POVZETEK

Čeprav je zeleni način proizvodnje napreden način, tržni mehanizmi zelenega načina delovanja proizvodnih podjetij ne spodbujajo. Za to je potrebna vladna regulacija. Ta prispevek opisuje evolucijski model, s pomočjo katerega se ugotovi, ali se proizvodna podjetja odločijo za uvedbo zelenega načina proizvodnje, ko vlada izvaja mehanizma nagrajevanja in kaznovanja. Za analizo vpeljave zelene proizvodnje v podjetja na konkurenčnem trgu smo vpeljali večkriterijski simulacijski model. Vpliv dejavnikov na strateško izbiro obeh strani (podjetje in vlada) smo simulirali s spremenjanjem različnih vplivnih dejavnikov, ki vključujejo vladne spodbude, kazni, stroške, razlike v stroških izvajanja zelene proizvodnje na strani podjetja, ugled podjetja in lažne nagrade ali kazni. Rezultati računalniške simulacije kažejo, da podjetja potrebujejo vladne smernice in predpise za usmeritev v zeleno proizvodnjo. Pri oblikovanju ustreznih politik bi morala vlada združiti različne strategije usmerjanja in regulacije ter v celoti upoštevati vpliv tržne konkurence.

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PODATKI O ČLANKU

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