Endogenous Risk of Stock Collapse and the Great Fish Pact

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The risk of stock collapse is an intuitive motivation for cooperative fisheries management. This study analyses the effect of an endogenously determined risk of stock collapse on the incentives to cooperate in a Great Fish War model. We numerically solve the model and find harvest strategies which are non-linear in stock. The model uses symmetric players and tests the Internal Stability of Grand Coalitions over a parameter space of stock growth and discount rates. The results show that the Grand Coalition is stable for a two-player game across all parameterisations. For 3 or more players, Grand Coalitions are stable for slower growing stocks, especially at low discount rates. Between 3 and 36 players, increasing the number of players reduces the number of parameterisations for which the Grand Coalition is stable. For more than 36 players, Grand Coalitions are stable for some parameterisations with slow growing stocks and the number of players no longer has an effect on Grand Coalition stability. The results thus show conditions under which a Great Fish War is in fact a Great Fish Pact.




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