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Simulation of Nordhaus Model (1975) in the Economy of Iran: Optimal Control Approach

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EXTENDED ABSTRACT

INTRODUCTION
The effect of economy on politics and the effect of politics on economy has always been considered by economists and politicians. A significant question in this area is related to the effects of elections on economy and the effect of the current economy status on individual choices. According to Nordhaus model, governments can provide political developments, especially victory in elections using economic policies, leading to economic instability. The empowered party selects economic policies during its tenure of office to maximize its popularity on the eve of the next election. Voters are influenced by the performance of macroeconomic variables, persuading officials to manipulate economic variables so that they can achieve desirable outcomes on the eve of election. Inflation and unemployment are among the most critical economic variables considered by voters and observed in their utility function.

Unemployment is considered as a destructive social, economic, and cultural phenomenon and its elimination has always been one of the main concerns of planners. In addition, unemployment has negative and adverse consequences in different fields. Unemployment is considered as a highly significant economic phenomenon for governments which always attempt to solve the socio-economic problem of unemployment. Furthermore, inflation, as one of the main variables, plays a considerable role in economic performance at the macroeconomic level. In general, unemployment and inflation are two target variables in economic policies and policymakers often have to sacrifice one of them to achieve the other one. Inflation and unemployment variables are more sensitive to electoral candidates and voters compared to other variables.

METHODOLOGY
This study simulated the optimal path of inflation and unemployment based on Nordhaus model in GAMS software for eight years during 1981-2029 and compared to their actual values during 1981-2020. Comparing the simulated

values and actual values of inflation and unemployment, the strengths and weaknesses of different governments, as well as their opportunism rate are identified and can be used as a policy recommendation.

FINDINGS

The results of this study indicated that governments have often attempted to increase voter satisfaction and the possibility of their re-election by adopting different economic policies. In addition, the average inflation during the eight-year periods have been mostly lower in the first half than the second half. Further, it can be regarded as evidence of Nordhaus model, although proving this claim requires further investigation in the economic policies of different governments and may not be intentional.

CONCLUSION

In order to separate from this opportunism by governments, achieve ideal inflation and unemployment, and increase their likelihood of re-election, it is necessary to accurately identify the parameters affecting the Phillips curve and having information about the type of policy, implementation, policy size, and effectiveness of policy. Selecting the policy type can only be a necessary condition while implementation, policy size, and the effectiveness of policy are considered as sufficient conditions.

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