

A Mathematical Model for Opportunistic Timing and Manipulation in Australian Federal Elections

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In this paper we develop a mathematical model for election timing using stochastic dynamic programming and game theory approach. In many Majoritarian Parliamentary Systems, the government has a constitutional right to call an early election. This right can give the government an advantage to remain in power for as long as possible by calling an election when its popularity is high. This problem can be compared with the determination of early exercise for American options in finance. This election timing is considered as a zero-sum game between the government and the opposition. Our analysis is based on the two-party-preferred data which measure the popularity of the government and the opposition. We propose a Stochastic Differential Equation (SDE) to describe the behaviour of the poll process and use a Maximum Likelihood Estimation (MLE) method to estimate its parameters. We assume that the government can call an early election and use controls termed ‘boosts’ to raise its popularity in the poll by introducing policy or economic actions. On the other hand, the opposition can also use boosts to pull the government’s popularity down by introducing policy and economic responses. Results are given in terms of the expected remaining life in power, call and boost probabilities at each time at any level of popularity. We are particularly interested in the Australian Federal Election for House of Representatives and perform a case study.

[This is a joint work with Elliot Tonkes and Kevin Burrage]