THE USE OF FINITE ABSORBING MARKOV CHAINS IN CAPACITY PLANNING IN A GRADUATE SCHOOL

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ABSTRACT

While much of the research that is conducted by academics is aimed at business and industry, there are also significant amounts conducted for their institutions. This Special Session is devoted to such institutional research. The author's Graduate School has as its major higher degree the DBA which has around sixty candidates requiring thesis supervision. This has placed strain on the School's capacity to provide the appropriate amount of supervision and thus great care is required in determining the commencing numbers into this degree. As a result of this planning imperative, the School has adopted the use of a finite absorbing Markov chain model to assist in the planning of intake numbers into the DBA program. The DBA program is a part-time one only and can take up to eight years to complete. The first year is devoted entirely to course work with the second and remaining years having an increasing research (thesis) component requiring a larger amount of supervision from academic staff each year. Given the likely staffing levels (of full-time academic staff and adjuncts available), the School needed to plan intake numbers and ensure that the total DBA population was at the correct level. Account also had to be taken of the supervision time required for PhD and Master of Business (Research) candidates' supervision requirements given the capacity of the Graduate School. These two latter degrees have much smaller populations with small intakes each year.

In order to plan the intake numbers of the DBA around the supervision capacity for the next, say, eight years, a finite Markov chain was defined and applied to the Graduate School's DBA program. The Markov chain facilitated the determination of appropriate intake numbers given the expected supply of supervisors and also provided a mechanism that permitted internal and competitive benchmarking of program attributes. Additionally, a simplified method of determining the expected duration prior to absorption into graduated or withdrawn absorbing states was developed. This latter development (along with the usual statistical information obtainable from such a model) allowed both internal and competitive benchmarking of the DBA to take place. It was found that the DBA compared very well with other part-time doctoral programs. The use of a simple finite absorbing Markov chain proved to be of significant benefit to the Graduate School in determining its DBA intake numbers and also fine tuning its DBA program to attempt to reduce the average time taken to complete the degree. Much of this work was reported in Nicholls [1].

REFERENCES

[1] Nicholls, M.G., The Development of a Markov Chain Model to Facilitate Planning and Benchmarking in a DBA Program, *38th Annual Meeting of the Decision Sciences Institute*, Phoenix, Arizona, USA, 19th – 22nd November, 2007, 291–296.