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**TOWARDS THE IDENTIFICATION OF A  
COST-EFFECTIVE SECURITY FOR  
BIOTECHNOLOGY COMPANIES**

**A Dissertation presented in partial fulfilment of the requirements  
for the degree of Doctor of Philosophy  
in Finance at  
Massey University**

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## **THE DETERMINATION OF A COST-EFFECTIVE SECURITY FOR BIOTECHNOLOGY COMPANIES**

### **ABSTRACT**

When biotechnology companies have a drug ready for submission to a regulatory authority issuer-investor aspects of security selection become important. If approval to market the drug is received then the company may wish to consider an alternative to their Equity and/or Option/Warrant type of financing. The successful issue of any security will require the approval of and the acquisition by interested investors as well as a guarantee that it is cost-effective as far as the issuer is concerned.

The research was divided into two parts: firstly, a questionnaire was sent to those institutional investors in Australia and the UK who were analysing pharmaceutical/biotechnology companies; and secondly, based on the results obtained from the questionnaire, six securities were selected for further investigation. The research then centred on determining which security would have the greatest benefit for the companies. In this part of the study cash flows and net present values (NPV) were calculated for each security. Spreadsheets using these data then formed the foundation for conducting a Monte Carlo simulation. The results of these simulations highlighted those variables which had the greatest impact on the end of year cash flows and company NPVs. Finally, a decision tree model was developed to ascertain which security was the optimal one for the company to use during the first five years of marketing its first drug.

The results demonstrate that during this first five year period the type of funding for the companies included in the study would be the same as those currently employed. However, by the end of five years the dominance of options/warrants as a form of financing was declining in favour of other equity-type securities. Therefore, the implications are that even though some positive cash flows were being generated during this period, the cash outflows associated with servicing and refunding fixed interest-type securities mean that they are not the most cost-effective source of funds for these companies.

## **DEDICATION**

To my husband David who has been my source of encouragement throughout my studies and for his patience and motivation when the obstacles seemed insurmountable.

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