

Preface

This book is concerned with the application of quantitative classification methods for the prediction of acquisition targets. We use publicly available data for a sample of EU banks to develop and compare a range of prediction models that distinguish the acquired banks from the non-acquired. As is presumed in the corporate finance literature, a model's ability to predict acquisitions is of major value to investors who could then decide on holding the target's portfolio of stocks in the expectation of high returns. Indeed, the empirical evidence is quite strong that shareholders of acquired firms earn abnormal returns around the announcement date of acquisition. From a managerial perspective, prediction models could be useful (to managers of acquirers) in examining cases of acquired firms that are close to the typical profile of the target firm. In a similar manner, managers could also determine whether their own firm is a potential target, allowing them to take appropriate steps to avoid a hostile takeover attempt.

From a purely academic perspective, researchers have employed a number of classification methods to develop prediction models for identifying takeover targets. Our survey of the literature (in Chapter 2) reveals that, over the last thirty years, about 30 studies have examined the prediction of takeover targets using financial or non-financial data, but all of these have focused on samples of firms drawn from the non-financial sectors (i.e. manufacturing, retail, hospitality, etc.) and excluded banks from their analysis. The present book distinguishes itself in being concerned with the development of prediction models specifically for the banking industry, and we utilize and evaluate a variety of classification methods on a common sample of banks covering

15 European Union countries (the former EU15). One reason for the exclusion of banks in previous studies on acquisition targets is the unusual structure of banks' financial statements suggesting that certain bank specific characteristics distinguish them from non-financial firms, and so most of the variables we have considered for developing prediction models are unique to the banking industry. We focus on the EU banking industry for three reasons. First, the recent trends of banks' M&As have not only significantly transformed the European banking industry but also provided an opportunity for collecting a broad-based sample with an adequate number of acquired banks, thus making an appropriate empirical basis for our study. Second, most of the previous studies relating to M&As in banking have focused on the US and, consequently, similar studies on EU banks are limited in number, these being more recent and focused on examining other aspect of banks M&As, such as the operating performance of banks (Vander Venet, 1996; Huizinga et al., 2001; Diaz et al., 2004), the impact of M&A announcement on the share prices of the merged banks (Tourani Rad and Van Beek, 1999; Cybo-Ottone and Murgia, 2000; Lepetit et al., 2004), and the takeover premium paid (Dunis and Klein, 2005). Finally, we also find that studies on the prediction of takeover targets have focused on individual countries, with the majority of them investigating the US and the UK. We have therefore sought to apply prediction techniques to the EU banking sector as a whole, given the emerging trends and the current academic interest on the subject. Indeed, our study fills a gap in the literature in attempting to develop prediction models for M&As in the banking sector, using a sample of banks for the EU countries.

The structure of this book has been designed to fulfill three main objectives. The first is to present an overview of the M&A trends in the EU banking industry and to survey the literature on the reasons and motives for M&As in banking, as well as the wider literature on the development of prediction models applied to M&As, with the intention of identifying the nature of underlying factors, financial as well as non-financial, influencing takeovers. Consequently, Chapter 1 begins with a discussion of recent M&As trends in the EU banking industry and goes on to review the evidence, referring to acquisition theories such as synergy, hubris and agency along with practitioners' views as outlined in

the reports of the European Central Bank (2000) and the Group of Ten (2001). We also review recent studies that deal with other aspects of banks' M&As as noted above. This is followed in Chapter 2 by an extensive study-by-study review of the literature on acquisition targets prediction, where we group studies according to three classification approaches (statistical, econometric, and various others including recently developed non-parametric multi-criteria and machine learning methods). The broader remit of these two chapters is intended to inform the reader to the wider range of issues making up the two strands of the literature we cover, one dealing with M&As specifically in the banking sector and the other with the empirical evidence on the predictions of M&As at large, although both these chapters provide the essential theoretical and empirical background to our study.

The second purpose for this book is to provide a methodological review of the classification procedures extant in the literature with an eye on presenting a proper evaluative basis for our empirical approach. Thus, in Chapter 3 we discuss the appropriate framework for the development and evaluation of prediction models, dealing extensively with issues such as sampling, variables selection techniques, available quantitative techniques used for classification problems and measures of evaluating models' performance in this respect. Although this chapter focuses mainly on the prediction of acquisition targets, the issues discussed are also relevant to other classification problems in finance and accounting, such as bankruptcy prediction, credit risk assessment and auditing. Our empirical analysis begins with Chapter 4, providing an account of the data sources and issues relating to sample selection and the choice of variables for model development. Here we explain, for example, how we construct a base sample of commercial banks covering 15 EU countries, and select financial variables measuring capital strength, profit and cost efficiency, liquidity, growth, size and market power, with data obtained in both raw and country-adjusted form (i.e. raw variables adjusted relative to the industry average for the corresponding country). In order to allow a proper comparative evaluation of models, we select common subsets of the base sample and input variables with high discriminatory power, dividing the sample

period (1998-2002) into training sub-samples for model development (1998-2000) and holdout samples for model evaluation (2001-2002).

While the methodology for prediction rests on identifying past cases of acquired firms and combining these with a sample of non-acquired firms, the predictive performance of the model depends on how accurately it classifies the proportions of the two groups of firms in a holdout sample (i.e. firms not used for model development). This leads to our third objective, dealt with in Chapters 5 and 6, which has been to conduct extensive empirical analysis involving a comparison of the prediction accuracies of various classification methods. In Chapter 5, seven different classification methods are employed (including two not previously applied to acquisition targets) to develop prediction models with raw and country-adjusted financial ratios, and these are evaluated on common holdout samples to provide a proper basis for comparison. Chapter 6 extends the analysis further to a comparison of two integrated methods of combining prediction models (i.e. multi-classifiers) in an attempt to investigate their predictive performance relative to the individual classification methods considered in Chapter 5. Integrated prediction models offer the advantage of counterbalancing relatively poor performance of some classification methods with good performance of others, but in doing so may not out-perform the individual classification methods. In general, our results tend to support the findings of most studies on non-financial firms, highlighting the difficulties in predicting acquisition targets, although the prediction models we develop show classification accuracies generally higher than chance assignment based on prior probabilities.

Although we limit our empirical study to commercial bank acquisitions in the EU, an important feature of the book is the methodological contribution we provide for a comparative evaluation of seven different classification methods, almost double in number compared to most previous studies.¹ Consequently, we believe that this book will serve as a basic reference for researchers and graduate students

¹ Of the 30 studies we review in Chapter 2, there are only eight that offer a comparison of various methods, of which four compare just two methods while the remaining four compare either 3 or 4 methods.

in the field of M&As and corporate takeovers, and indeed it could serve as a useful textbook for a specialist graduate course dealing with the application of classification methods in decision sciences. Furthermore, in the concluding chapter, while summarizing our main findings and suggesting possible extensions for further research, we seek to explain why prediction results differ with the use of different algorithms in solving classification problems.

F. Pasiouras

S. Tanna

C. Zopounidis

