

Chapter 6

Estimating the CAPM Beta for Public and Private Firms: Challenges and Solutions

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ABSTRACT

This chapter presents solutions to some challenges when calculating CAPM Beta. Three methods for calculating traditional beta are presented and illustrated through the case of Facebook. Different choices of market index, data frequency, and sample size result in different values of beta; however, in all cases beta was greater than one. The chapter explores ordinal beta as an alternative measure to treat outliers in both developed and thin markets. Using a sample of 84 US stocks, there was no statistical difference between median traditional and ordinal betas. This was not the case for a sample of 47 Colombian stocks, which questions the usefulness of traditional beta in thin markets. In contrast with median traditional beta, median ordinal beta did not change significantly as a result of irregular data series. The contrary occurred when the observation (sampling) period was reduced; this leaves open the question of subjectivity when defining such period. Finally, the process of valuing a private company was illustrated through the case of Palmoil Ltd., a Colombian company.

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INTRODUCTION

Beta is one of the vital variables in company valuation. It is a component to calculate the cost of equity within the Capital Asset Pricing Model (CAPM). However, estimating beta has become among the challenging issues due to lack of universal criteria in determining the estimation variables such as: historical sample size, data frequency, outliers and portfolio market returns. In this chapter, an attempt is made to outline and discuss these challenges and suggest some possible remedies for both public and private companies.

The chapter does not intend to reach conclusions about solutions to the challenges. Instead, it extends the existing debates in the literature on practical issues to be considered in order to overcome the estimation challenges. Specifically, these practical challenges are addressed contextually, utilizing real company cases as well as taking into account contrasting circumstances between developed markets and thin markets (emerging markets or infant markets). The chapter focuses on the following specific aspects:

1. It gives a brief theoretical background of the CAPM, its practical limitations and the role of beta.
2. Second, it describes the general procedure in estimating CAPM beta, with specific emphasis on data requirements, challenges and possible solutions. On this aspect a clear distinction is made between practical problems in developed markets and emerging markets. Here, the US is used to represent developed markets, whereas Colombia represents thin markets.
3. It addresses the issues of outliers by introducing an alternative beta estimate, hereafter referred to as ordinal beta. In this aspect, a contrasting analysis is made between the traditional CAPM beta and the ordinal beta, focusing on their suitability in developed markets and thin markets.
4. It presents a method of estimating beta for private companies based on beta of comparable public companies, while highlighting limitations and solutions.

Background

In company valuation, one of the crucial ingredients in estimating the value of equity is the cost of equity, which is usually calculated using the CAPM. The CAPM, which is nested on the risk-return trade-off hypothesis (Markowitz, 1959; Sharpe, 1964; Lintner, 1965; French et al., 1987, Fama & French, 2004), contends that an investor is expected to earn higher than ‘normal’ returns for investments with higher risks, following the finance principle of “the higher the risk the higher the return”. Therefore, return on equity depends solely on the risk that cannot be eliminated through diversification (i.e.: systematic risk, which is measured by beta).

The CAPM is based on the following assumptions: First, investors are well diversified on individual assets (unsystematic risk) through portfolio investments. Therefore, their expected rate of return depends only on the systematic risk (beta) of their portfolios. Second, there is a Single-period transaction horizon because all investors are myopic: they have only one and the same holding period. Third, investors can borrow and lend at the risk-free rate of return. Fourth, capital markets are perfect. Hence, all securities are priced correctly.

However, CAPM has some limitations, which contradict its assumptions. First, the perfect market assumption cannot truly apply in real-world capital markets, even in advanced and well-developed stock markets. Moreover, as pointed out by Reilly and Brown (2003), transaction costs in the real world do not allow investors to correct all the mispricing because transaction costs tend to offset any potential excess

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