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Introduction

Exotic options are options for which payoffs at maturity cannot be replicated by a set of standard options. This is obviously a very broad definition and does not do justice to the full spectrum and complexity of exotic options. Typically, exotic options have a correlation component. Which means that their price depends on the correlation between two or more assets. To understand an exotic option one needs to know above all where the risks of this particular exotic option lie. In other words, for which spot price are the gamma and vega largest and at which point during the term of this option does it have the largest Greeks. Secondly, one needs to understand the dynamics of the risks. This means that one needs to know how the risks evolve over time and how these risks behave for a changing stock or basket price. The reason that one needs to understand the risks of an exotic option before actually pricing it is because the risks determine how an exotic option should be priced. Once it is known where the risks lie and the method for pricing it is determined, one finds that the actual pricing is typically nothing more than a Monte Carlo method. In other words, the price of an exotic option is generally based on simulating a large set of paths and subsequently dividing the sum of the payoffs by the total number of paths generated. The method for pricing an exotic option is very important as most exotic options can be priced by using a set of different exotic options and therefore saving a considerable amount of time. Also, sometimes one needs to conclude that the best way to price a specific exotic option is by estimating the price with a series of standard options, as this method better captures the risk involved with this exotic option. The digital option is a good example of that and will be discussed in Chapter 9.

Before any exotic option is discussed it is important to fully understand the interaction between gamma and theta. Although this book assumes an understanding of all the Greeks and how they interact, the following two sections give a brief summary of the Greeks and how the profit of an option depends on one of the Greeks, namely the gamma. A more detailed discussion of the Greeks and the profit related to them can be found in *An Introduction to Options Trading*, F. de Weert.

