Chapter 9
Algorithmic Trading and Transaction Costs

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ABSTRACT

“Algos” are algorithmic trading strategies that are meant to optimize the execution quality of the trades in terms of transaction costs and market-timing. This chapter presents the transaction costs taxonomy and popular algorithmic execution strategies. Authors empirically examine a dataset of hedge fund transactions. Our results suggest that implicit transaction costs are characterized by a significant buy-sell asymmetry. To get some insight about the possible determinants of Implicit Transaction Costs, authors investigate the algo type and stock characteristics such as market capitalization, relative volume, inverse prior close, price momentum, buy indicator and trade duration. Both in-sample and out-of-sample tests show that a significant portion of transaction costs can be anticipated before the trade execution. Results show that high-level execution strategies can be constructed to optimize the algo choice.

INTRODUCTION

Superior investment performance is the result of a meticulously planned process that involves the concurrent pursuance of multiple objectives. Although some among
these objectives are purely financial (e.g. estimating expected returns, quantifying market/credit risks and extreme losses, etc.), other – no less important - are operational in nature. Efficient trade execution belongs to the latter category and constitutes an undisputed key factor of success; one that can effectively “make or break” a successful investment process. For, it is common knowledge in the world of practitioners - especially in the quant investment fund business - that transaction costs can easily erode portfolio returns and destroy strategies, that looked – at least in theory – very promising and innovative.

This chapter presents a statistical-based framework for monitoring transaction costs. Specifically, we present an overview of algorithmic trading and of the related transaction cost measures. We estimate their impact on investment performance and propose heuristics that can be used for the improvement of trade execution strategies.

As case study, we empirically analyze the transaction costs of two - relatively small, yet very active in the global markets - long-short equity hedge fund businesses. We measure implicit trading costs using different types of measures and examine their distributional properties. We then investigate possible determinants of implicit trading costs, using regression-based models. Finally, we test the out-of-sample predictive power of the explanatory models.

The rest of this chapter is organized as follows. Section 2 defines transaction costs and their components. In section 3 we discuss issues related to algorithmic trading including popular strategies. Section 4 provides a brief review of the literature on transaction costs. Section 5 describes the data and section 6 presents the empirical results. Finally, section 7 summarizes and concludes.

TRANSACTION COSTS

In market microstructure, liquidity is commonly defined as the ease with which market-users can trade (buy/sell) the asset of exchange, once they decide to do so. For that reason, market-users are typically called the “buy side” of the market – since they “buy” liquidity services, whereas the providers of such services (brokers/dealers/market-makers/standing limit orders) are known as the “Sell side”. Within this context, transaction costs are the premia paid by the “buy side” to the “sell side” as compensation for the liquidity the latter provide.

Transaction costs are divided into two broad categories: Explicit and Implicit costs. Explicit costs are pre-determined, often fixed, and relatively easy to calculate. These include commissions, fees, taxes and bid-ask spreads. Implicit costs, on the other hand are more subtle, and as such they need to be inferred from the observed prices only after making specific assumptions. Implicit costs include investment delay, market impact costs, opportunity costs and market timing costs.
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