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## Momentum profits and conditional time-varying systematic risk



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### ABSTRACT

The predictability of security prices and the ability to develop profitable trading strategies is of great interest in the financial world. This paper examines momentum profits over the period January 1980 to December 2010 in the UK stock market, and attempts to explain whether such profits can be attributed to time-varying systematic risk based upon the conditional CAPM. Time-varying betas are estimated from time-varying conditional variances and covariances, where conditional information is incorporated by modelling variances and covariances using ARCH, GARCH and GARCH-M models. For the majority of momentum trading strategies winner portfolios show higher systematic risk than loser portfolios, and in some cases this difference is found to be statistically significant.

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## 1. Introduction

In recent years there has been growing interest over the predictability of future security prices, and the adoption of investment strategies, based upon such predictions, producing abnormal returns. Momentum trading is one such investment strategy based upon the examination of past security prices. Momentum trading exploits the serial correlation present in security returns. It is a strategy based upon the notion of positive serial correlation, assuming that those securities that have performed well in the past will continue to do so in the future. The strategy simply involves buying securities that have performed well over differing time horizons and selling underperforming securities. Clearly, if positive serial correlation exists in security returns adopting such a trading strategy will be profitable to investors. Much of the research to date in this field has generally taken the approach of examining

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such a strategy, and in many cases profitable momentum-trading strategies have been found. However, no unique explanation has been provided to explain the existence of momentum profits. This paper attempts to address this important issue by asking the question as to whether the higher returns found with momentum securities results from higher conditional time-varying systematic risk.

There have been a number of studies examining momentum trading in order to attain whether such strategies do indeed generate momentum profits. Momentum studies to date have examined different stock markets over short, medium and long-term horizons. Short-term investment is generally regarded as up to three months, medium-term between 3 and 12 months, and long-term up to five years. Early studies by [Jegadeesh and Titman \(1993\)](#) examining both the New York Stock Exchange (NYSE) and the American Stock Exchange (AMEX) over the period 1965–1989 found evidence of momentum profits over a medium-term horizon on the US stock market. [Conrad and Kaul \(1998\)](#) also examining the NYSE and AMEX, though over a longer time period, 1926–1989, found similar evidence of momentum profits over a medium-term horizon. A recent US study by [Wang and Wu \(2011\)](#) found significant momentum profits confirming the findings of [Jegadeesh and Titman \(1993\)](#). The finding of momentum profits has not just been restricted to the US. Studies by [Rouwenhorst \(1998\)](#) and [Doukas and McKnight \(2005\)](#) examining a number of European stock markets, both found evidence supporting the existence of momentum profits over the medium-term horizon, as too did [Richards \(1997\)](#), [Chan et al. \(2000\)](#), [Griffin et al. \(2003\)](#) and [Balvers and Wu \(2006\)](#) on examining a wide range of global stock markets. With respect to the UK market, an extensive study by [Hon and Tonks \(2003\)](#) examining securities over the period January 1965 to December 1996, found that the application of momentum trading provided significant momentum profits over the short to medium term horizon. [Liu et al. \(1999\)](#), [Galariotis et al. \(2007\)](#) and [Li et al. \(2008\)](#) also found evidence of momentum profits for various medium-term horizon trading strategies when examining the UK market. The application of momentum trading in further afield global markets has also produced similar findings. A study of the Asian stock markets by [Hameed and Kusnadi \(2002\)](#) and later studies by [Demir et al. \(2004\)](#) on the Australian stock market, [Wang and Chin \(2004\)](#) and [Naughton et al. \(2008\)](#) on the Chinese stock markets, all found strong evidence of momentum profits. Such findings across many of the world markets support the notion of positive serial correlation. In light of these findings, it seems that securities which have performed well in the past may continue to perform well over short to medium-term horizons. Thus, the application of momentum trading, namely buying these well performing securities and selling underperforming ones, may have the capacity to generate momentum profits.

It is clear to see from previous studies that momentum profits exist. The important question arises as to how such profits can be explained. One could argue that the ability to create profitable trading strategies on the basis of past performance is a sign of market inefficiency. An efficient market, in the sense of weak-form efficiency, is one in which the current price of a security reflects all available past information and thus security prices follow a random walk. The ability to generate significant momentum profits from a trading strategy based upon past performance is a blow to weak-form market efficiency.

Another argument could be that the market is actually efficient and the profits arising from the trading strategy are simply the result of compensation for higher risk, a simple case of positive risk–return relationship. If this is the case then winner portfolios would have a higher risk than loser portfolios. There exists much evidence to suggest that momentum profits are not a consequence of higher risk exposure. [Jegadeesh and Titman \(1993\)](#) examined the US markets using an unconditional CAPM to estimate systematic risk and found no evidence to suggest that profitability of momentum strategies is attributable to their systematic risk. The UK study by [Hon and Tonks \(2003\)](#), similarly adopting the unconditional CAPM to examine the risk–return relationship, found that the returns associated with momentum trading strategies could not be explained by systematic risk given that no difference was found between the risk of the winner and loser portfolios. Similar findings were found by [Galariotis et al. \(2007\)](#), also on the UK market, and [Demir et al. \(2004\)](#) on the Australian market again using an unconditional market model to examine the risk–return relationship. Similar conclusions were reached when using the [Fama and French \(1993\)](#) three-factor model to explain the risk–return relationship. Studies by [Chan et al. \(1996\)](#) and [Fama and French \(1996\)](#) on the US Market and [Galariotis et al. \(2007\)](#) on the UK market all failed to explain momentum profits through the risk–return relationship based upon the [Fama and French \(1993\)](#) three factor model. The [Griffin et al. \(2003\)](#) unconditional

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