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Full length article

## Is there momentum in factor premia? Evidence from international equity markets

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### ABSTRACT

This study examines the momentum effect in the returns of factor premia representing a broad set of stock market strategies. Using cross-sectional and time-series tests, we investigate the performance persistence of market, value, size, momentum, low-risk, and quality premia within a sample of 24 international equity markets for the years 1990–2016. We provide strong evidence that the top performing factors continue to outperform the worst performing factors both in individual equity markets and in the cross-country framework. The momentum in factor premia is largely explained by the classic stock-level momentum effect.

### 1. Introduction

The momentum effect is the tendency of assets with good past performance to continue to overperform in the future and of assets with poor past performance to continue to underperform. It is one of the most robust and pervasive stock market anomalies ever discovered. The effect has been documented across many stock markets (Chui et al., 2010) and asset classes (Asness et al., 2013). It is a strategy that has worked well for more than two centuries. Chabot et al. (2008) proved that momentum was profitable even in the Victorian age, and Geczy and Samonov (2016) have made a tremendous research effort to demonstrate that momentum has been present in the U.S. equity market since 1800.

This paper examines the momentum effect in a novel environment: equity factor premia. We show that the factors that drive returns in equity markets are not random: they are determined by an underlying pattern stemming from the momentum effect.

We thus examine returns on six asset-pricing factors which are widely recognized and backed up by solid theoretical and empirical evidence: market excess return (MKT), small minus big (SMB), high minus low (HML), up minus down (UMD), betting against beta (BAB), and quality minus junk (QMJ). These factors correspond with equity market risk premia and numerous anomalies related

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to company size, value effect, momentum effect, low-volatility effect, and quality effects, respectively.<sup>1</sup> All of these have been examined in numerous international markets and asset classes, and represent a broad panel of cross-sectional effects in equity markets.

To assure the comprehensiveness of our results, we base our investigations on data from 24 individual, developed equity markets for the years 1990–2016. Our study relies on a series of cross-sectional and time series tests. We build zero-investment long-short portfolios assuming long (short) positions in factors which performed best (worst) in the past, and evaluate their performance against the four-factor asset-pricing model (Carhart, 1997) and against a naive benchmark of all of the factors. We examine the factor momentum using three approaches: (a) in the returns on the six factors in individual countries, (b) in the returns on factors of one type across the 24 countries, and (c) in a pooled sample of 144 assets (i.e., the six factors across the 24 countries).

The paper aims to contribute in three ways. First, we reexamine the concept of momentum in styles (Chen and De Bondt, 2004; Teo and Woo, 2004; Tibbs et al., 2008; Clare et al., 2010; Chen et al., 2012; Kim, 2012; Chao et al., 2012) and anomalies (Zaremba and Szyszka, 2016; Zaremba, 2018; Avramov et al., 2017). We rework and generalize this approach: instead of testing the performance persistence of individual anomalies, we investigate the momentum in the returns on popular factor premia—which explain the abnormal returns on a broad spectrum of cross-sectional patterns. The returns on individual anomalies might be derived from common sources and would therefore display significant correlation in returns. Meanwhile, a number of studies have indicated that the large number of cross-sectional patterns can be reduced to a smaller number of dimensions; a plethora of anomalies could therefore be explained by a small number of relatively uncorrelated asset-pricing factors (see Fama and French, 1996; Hou et al., 2015).

Second, we markedly extend the geographical scope of earlier studies. We study the momentum effect in factor premia (later called the factor momentum) in international equity markets. Most equity anomalies and return patterns have been discovered and initially documented in the U.S. market. Meanwhile, they usually fare poorly in out-of-sample studies (Welch and Goyal, 2008; McLean and Pontiff, 2016). In particular, Li et al. (2016) and Jacobs (2016) show that only a fraction of them prove profitable in international markets. Thus, by examining the robustness of the momentum in factors, our goal is to provide new insights into international asset pricing.

Third, we offer a new explanation of the factor momentum. Despite the existing research, there is no single, broadly accepted explanation for the momentum found across investment strategies. Barberis and Shleifer (2003) suggest that some investors categorize risky assets into different styles and allocate funds based on relative past performance. Thus, the investors move into styles that have provided good returns in the past and finance this shift by withdrawing funds from styles that have underperformed. Barberis and Shleifer (2003) also assume that these fund flows affect prices and imply an autocorrelation in style returns. Peng and Xiong (2006) argue that due to limited attention, investors tend to focus more on market-level and sector-level information than on firm-specific information, whereas Teo and Woo (2004) attribute style momentum to performance chasing. On the other hand, Kim (2012) interprets the style momentum as being consistent with underreaction models. Finally, Avramov et al. (2017) indicate that due to investors' learning as well as improvement in liquidity, the profitability of investment strategies may decline with time. Thus, the momentum strategy might be used as a tool to select the most robust cross-sectional patterns.

In contrast with these views, we hypothesize that factor momentum is a manifestation of the standard momentum effect. In other words, we assume that if the momentum effect is present in the returns on individual stocks, then one should rationally expect the momentum phenomenon to also exist in the portfolios of these stocks, including factor portfolios.

The major findings of this study can be summarized as follows. First, we provide strong evidence for the factor momentum in international markets. In the majority of the investigated countries, the past top performing factors continue to outperform the worst performing factors. The phenomenon is significant throughout the entire period, in sub-periods, and under various breakpoints, weighting schemes, and ranking periods (although admittedly, it is the strongest for the 12-month ranking period). Despite this significance, however, the factor momentum portfolios do not outperform the naive benchmark of all the anomalies on a risk-adjusted basis. Furthermore, the application of the four-factor model reveals that the returns on the standard momentum UMD factor are the key drivers of the momentum in factor premia. In other words, the factor momentum proves to be a manifestation of the standard momentum effect.

Second, we document the strong momentum effect across countries when a single factor or multiple factors are considered. The phenomenon exists in the returns on MKT, SMB, HML, and QML, and is particularly strong in the BAB returns. It is not present in UMD, however. In other words, we find no “momentum in momentum,” which is consistent with our hypothesis that the factor momentum is a manifestation of the classic stock-level momentum. The cross-country factor momentum effect is also as robust as the momentum in individual countries, but this can still be largely explained by the UMD factor. With the notable exception of the BAB factor, the application of the four-factor model dramatically diminishes the abnormal returns, thus making them predominantly insignificant. Even when we consider all of the 144 international factors (six factors in 24 countries), the adjusted returns are more than 50% lower than the raw returns and retain their significance only in the equal-weighting scheme.

To sum up, this paper contributes in two ways. First, we document the momentum effect in factor premia in a comprehensive international sample. Second, we provide an explanation for this phenomenon by showing that it is a manifestation of the standard stock-level momentum pattern. The results are important from both an academic perspective and a practitioner's perspective.

The rest of the article has the following structure. The next section, Section 2, provides a description of the data and the methods

<sup>1</sup> For size, value, and momentum, see Fama and French (2012), de Groot et al. (2012), Cakici et al. (2013), and Asness et al. (2013). For low-volatility, see Baker and Haugen (2012) and Frazzini and Pedersen (2014). Finally, for quality, see Asness et al. (2014).

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