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Paper profits or real money? Trading costs and stock market anomalies in country ETFs☆

Adam Zaremba[a,b,*], Laura Andreu[c]

[a] University of Dubai, United Arab Emirates
[b] Poznan University of Economics and Business, Poland
[c] University of Zaragoza, Spain

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ABSTRACT

Are the quantitative equity strategies for country selection robust to implementation costs? To answer this question, we conduct a comprehensive examination of the country-level strategies so far. We review, classify, and replicate 120 equity anomalies within a sample of 42 country equity indices for the years 1996–2017. Next, using ETF price and spread data, we test the effect of real-life conditions and trading costs on the anomaly performance. We also examine three cost-mitigation strategies: infrequent rebalancing, capitalization-based weighting, and focus on low-cost securities. We find that 46% of the long-only monthly rebalanced anomaly portfolios display significant alphas, concentrated strongly among strategies based on value, momentum, and liquidity. The effect of transaction costs proves largely lethal to returns, leaving only a handful of anomalies profitable. Less frequent rebalancing (annually) helps to regain the effectiveness of the strategies, increasing the monthly alphas on the long-only anomaly portfolios to 0.44% on average.

1. Introduction

Paper profits are sometimes very difficult to turn into real money, and the story of the self-defeating success of Value Line may serve as a classic example. For decades, this company offered equity investors highly successful stock rankings (Salomon Jr., 1998). The stock-picking system had striking predictive abilities, and even Fischer Black, a strong believer in the efficient market hypothesis, admired the system for its efficiency (Black & Kaplan, 1973).[1] In 1979, Value Line decided to establish a mutual fund that invested in the stocks it was recommending to its readers. Alas, the results were at best disappointing. Not only did the real money portfolio fail to keep pace with the system's paper returns, it did not even outperform the market. In the years 1979–1991, the Value Line paper portfolio delivered an annualized return of 26.2%, but the fund produced only 16.1% per annum (Leinweber, 1995). What went wrong? Admittedly, part of the difference could be attributed to Value Line readers purchasing the same stocks at the same time. But a significant portion of the drag could be explained by trading and implementation costs (Leinweber, 1995; Perold & Salomon Jr, 1991; Salomon Jr., 1998).

Naturally, the markets now are not the same as they were in the 1990s. Among other changes, we have seen a huge proliferation of exchange traded funds (ETFs) and index funds, which have given investors cheap, liquid, and efficient access to international equity markets. Now, more easily than ever before, investors can allocate their money around the world. With just one click of the mouse, they can quickly move capital from one country to another. This index revolution was quickly followed by the development of quantitative country-level investment strategies that could be employed to pick the best performing ETFs and country indices. Recent studies show that well-known return patterns, such as value, momentum, size, and low-risk, are present not only at the stock level, but also at the index level.[2] The academic community has once again delivered an array of strategies, which—at least on paper—work very well. Still, even in the new reality,

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* Corresponding author at: Department of Investment and Capital Markets, Poznan University of Economics and Business, al. Niepodleglosci 10, 61-875 Poznan, Poland.
E-mail addresses: adam.zaremba@ue.poznan.pl (A. Zaremba), landreu@unizar.es (L. Andreu).

[1] Recently, Zhang and Alexander (2016) reviewed 60 academic studies on Value Line from the years 1967 to 2015, confirming its forecasting abilities.

[2] See, e.g., for value: Kim (2012); for momentum: Balvers and Wu (2006), Bhojraj and Swaminathan (2006); for size: Keppler and Traub (1993), Keppler and Encinosa (2011); for low-risk: Frazzini and Pedersen (2014), de Boer, Campagna, and Norman (2014), and Umutlu (2015).

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the old questions remain: can these paper profits be translated into true money? Do they withstand the implementation-shortfall reality check? The main aim of this research is to try to answer these questions. In other words, we would like to find out which of the stock-level anomalies are present in country equity indices tracked by ETFs, and to what extent they can be translated into successful country-picking strategies that survive the effect of trading costs.

Our study aims to contribute in three ways. First, we conduct the most comprehensive test ever done of return patterns in country equity indices tracked by ETFs. We aim to determine which of the stock-level return predictive variables also work at the country level. To this end, we review, classify, and replicate 120 equity anomalies at the country level. We use sorting to form long-only and long-short portfolios, and test their performance within a sample of 42 equity indices for the years 1996–2017. This is by far the broadest examination to date of the cross-sectional return patterns in equity indices; earlier studies focused on a single variable, such as size (Keppler & Traub, 1993), momentum (Balvers & Wu, 2006), or reversal (Baltussen, van Bekkum, & Da, 2016; de Groot, Huij, & Zhou, 2012; Spierdijk, Bikker, & van den Hoek, 2012), or considered only a small number of strategies together (Umutlu & Bengitöz, 2017; Zaremba, 2016a). Our research not only re-examines all the patterns already discovered, but also extends the array of potential return patterns.

Second, we test to what extent these country-level equity anomalies could be translated into profitable true-money strategies using ETFs. Thus, we replicate the anomalies with ETFs, accounting for trading costs and using real market spread data. Subsequently, we evaluate their post-cost performance. In this aspect, our study is related to the strain of research that aims to assess the effect of trading costs on quantitative equity strategies, including Korajczyk and Sadka (2004), Lesmond, Schill, and Zhou (2004), Frazzini, Israel, and Moskowitz (2012), and Novy-Marx and Velikov (2016). As far as we know, with the exception of the examination of momentum in ETFs (e.g., Andreu, Swinkels, & Tjong-A-Tjoe, 2013; Tse, 2015), this issue has not been comprehensively investigated so far.

Third, we check to what extent the effect of trading costs could be avoided with the use of cost-mitigation strategies. Hence, we test three well-known techniques—less-frequent portfolio rebalancing, capitalization-based weighting, and focusing on low-cost securities—and examine their efficiency for quantitative ETF strategies. Although this question has been researched with regard to anomalies in individual equities (e.g., by Agyei-Ampomah, 2007, Lesmond et al. (2004), Hanna and Ready (2005), Novy-Marx & Velikov, 2016, and Chen & Velikov, 2017), it has never come under scrutiny in the universe of single country ETFs or indices. We also compare the practical cost-adjusted efficiency of long-only and long-short portfolios. Thus, we also contribute to the literature discussing whether long-short or long-only implementation is preferable (e.g., Briere & Szafarz, 2017; Huij, Lansdorp, Blitz, & van Vliet, 2014).

The key findings of this paper can be summarized as follows. First, of the 120 tested anomalies, 55 and 22 could be translated into positive and significant anomalies on long-only and long-short portfolios of country equity indices, respectively. The mean monthly alphas on these strategies amount to 0.41% for long-only portfolios and 0.52% for long-short portfolios. The profitable anomalies concentrate largely in the categories of value, momentum, and liquidity strategies.

Second, the influence of trading costs on the returns from monthly rebalanced anomaly portfolios proves largely lethal. In particular, in the case of high-turnover momentum strategies, the significant gains are forgone and transform into structural and significant losses. In fact, only a few strategies survive the deadly effect of transaction costs—and these include liquidity-driven strategies, which are characterized by very low turnover.

Third, infrequent rebalancing proves the most successful cost mitigation strategy. Reducing the portfolio-reforming frequency from one month to one year dramatically reduces the portfolio turnover and, in consequence, the implementation costs. Hence, as many as 49 of the 55 long-only anomaly portfolios that worked well with equity indices on the pre-cost basis continue to overperform with ETFs, even after accounting for trading costs: the anomalies produce a mean alpha of 0.44% per month. The two other approaches—capitalization-based weighting and discarding the most expensive securities—do not lead to any further improvement in performance.

The remainder of the paper is organized as follows. Section 2 presents the data sources and sample. Section 3 focuses on the replication of the equity anomalies at the country level, and Section 4 examines the impact of trading costs on their performance. Section 5 investigates cost mitigation strategies, and, finally, Section 6 concludes the paper.

2. Data

This research is based on stock market and accounting data obtained from the Bloomberg database. We conduct our examinations within two samples: a) 42 MSCI equity indexes calculated and tracked by single country-ETFs, and b) 42 single-country ETFs. We use iShares ETFs managed by BlackRock because they provide the broadest geographical coverage. The study relies on monthly observations, and the sample period runs from April 1996 to April 2017.[3] An MSCI index is included in the sample at month t when it is possible to compute all its returns in month t, its stock market capitalization in t-1, and when the ETF return is available for the same period. This unification provides consistency between the index and ETF return samples. An overview of the sample is presented in Table A1 in the Appendix.

The initial data on equity indices are collected in their local currencies and subsequently converted to U.S. dollars to obtain a pooled international sample. Analogously, our sample includes ETFs denominated in U.S. dollars. We examine total gross returns that are the returns adjusted for distributions, but not adjusted for taxes on dividends. To ensure consistency with the U.S. dollar approach, the risk-free rate is the one-month Treasury bill rate.[4]

Some of the strategies tested in this paper rely on country-level fundamental variables and financial ratios. To obtain these, we weight the characteristics of individual components according to the index weighting scheme.[5]

3. Replicating anomalies at the country level

This study relies on a sample of 120 international equity strategies which replicate stock-level anomalies at the country level. The selection of the anomalies was motivated by previous research studies on cross-sectional return patterns and specifically includes the selections made by Hou, Xue, and Zhang (2017) and Jacobs and Müller (2017). We also apply additional screens. For inclusion, an anomaly has to be computable using accounting and market data from standard databases, such as Bloomberg. The anomaly strategies must be replicable with the use of long-short portfolios based on cross-sectional rankings of securities. Furthermore, they must be implementable using the data, which could be transformed to the country level.[6] Finally, we test only strategies

[3] The sample period of returns is dictated by data availability, including ETF prices and spreads, in particular. Nonetheless, we also use earlier data when it is necessary to calculate some return predicting variables, for instance, historical index returns for price-based strategies (e.g., momentum or reversal).

[4] We thank Kenneth R. French for providing this data at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[5] The index-level ratios are computed by Bloomberg. Furthermore, when a strategy relies on accounting data, to calculate the return in month t we use data from month t-5 to avoid look-ahead bias.

[6] In a few cases, we have slightly modified the original anomaly computation procedures to overcome the difficulties with data availability in emerging markets. For example, we substituted default Bloomberg credit risk evaluations for the (unavailable) formal agency credit ratings when replicating the strategies of Avramov, Chordia, Jostova, and Philipov (2007, 2009). All these cases are clearly described in Table A2 in the Appendix.