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The world price of sentiment risk

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ABSTRACT

This paper examines whether sentiment can be considered a priced source of risk on international financial markets. We investigate whether residual sentiment is rewarded with a risk premium if added to a model with macroeconomic fundamentals and analyze the time-variation of the respective risk premia. The analysis is performed in the framework of a conditional multiple-beta pricing model and focusses on the excess returns of the G7 stock markets in the period from February 1999 to February 2012. The obtained results indicate that sentiment indeed earns a significant risk premium of around 2% p.a. on the considered markets.

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1. Introduction

Risk premia play an essential role in finance since they are an important component in widely used beta-pricing models such as the Capital Asset Pricing Model (CAPM) or Arbitrage Pricing Theory (APT) models as well as a necessary input for the determination of optimal portfolio weights in strategic asset allocation. The significance of risk premia is also insofar obvious as investors are usually willing only to take on risk if it is rewarded with a certain risk premium.

In the traditional approach these sources of risk are assumed to reflect the systematic changes in the state of the economy. In CAPM, for example, this source of risk is given by a single factor which represents the market portfolio. For our study we follow another class of beta-pricing models, the APT models, which allow several factors and thus it is possible to examine the influence of several sources of risk on asset returns. This approach was also used, for example, by [Chen, Roll, and Ross \(1986\)](#); [Ferson and Harvey \(1991\)](#) and

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Ferson and Korajczyk (1995) for the analysis of the US returns. Brown and Otsuki (1993) and Ferson and Harvey (1995) are examples for the application of this concept in an international setting.

The present paper also considers an international context, however, we extend the traditional models with macroeconomic fundamentals by a new aspect that was gaining on significance over the last decades. This aspect concerns the influence of investor sentiment on financial markets and in particular on asset returns. Since 1990s there was a variety of studies that examined the role of investor sentiment along with the classical macroeconomic variables for the explanation of returns. Some of these papers deal with the theoretical implications and modeling of sentiment (for example Barberis, Shleifer, & Vishny, 2012; Dumas, Kurshev, & Uppal, 2009; Hong & Stein, 1999) whereas the majority examines the relationship between sentiment and asset returns empirically (see for example Baker & Wurgler, 2006, 2007; Baker, Wurgler, & Yuan, 2012; Brown & Cliff, 2005). In general, these studies find a negative relationship between sentiment and future returns which can be supported by the results of the present paper.

Contributing to this latter strand of the literature the purpose of the present paper is to study the influence of sentiment on asset returns in an international multiple-beta pricing model. However, we are going further than most of the previous studies and pay closer attention to the corresponding risk premium of sentiment which has found little attention by the academic research so far. We model the time-variation of the sentiment risk premium (as well as of the risk premia of the other macroeconomic factors) which allows for tracing the development of the risk premia over time. Our approach focuses on aggregate country-level returns of the G7 countries in the period from February 1999 to February 2012. We consider survey-based measures as proxies for sentiment. In particular, the Consumer Confidence Indicator (CCI) and the Business Confidence Indicator (BCI) from OECD, as well as the first principal component of these indicators are employed in course of the analysis.

In general, empirical studies report a negative relationship between sentiment and future asset returns. However, we focus on contemporaneous returns in order to calculate the corresponding risk premia. For instance, the contemporaneous approach can also be found in Lee, Jiang, and Indro (2002) or Baker and Wurgler (2007). Usually, the contemporaneous relationship between sentiment and asset returns is found to be positive although theoretical considerations support both positive as well as negative correlation. The ultimate direction of the relationship, i.e. the sign of the beta, depends on the respective dominance of the underlying effects such as 'hold-more' or 'price-pressure' effects that were first introduced by De Long, Shleifer, Summers, and Waldmann (1990).

We find a strong significant negative relationship between both CCI and the first principal component with the considered contemporaneous G7 asset returns. These results indicate that the 'price-pressure' effect dominates the relationship between sentiment and contemporaneous asset returns in our analysis. Hence, bullish sentiment rises the demand for risky assets leading to higher prices and consequently lower returns. Notably, the inclusion of sentiment does not offset the significance of other relevant macroeconomic factors compared to the benchmark model. This finding supports the view that the chosen sentiment proxies indeed represent a valid risk factor that is not yet covered by the selected macroeconomic variables. The most remarkable result of the present study is, however, that the calculated sentiment risk premia are found to be significant and of exceptional relevance for the respective risk compensations of the G7 countries.

There is a variety of papers that examine the influence of different sentiment measures for single countries using various models (e.g. multiple-beta model as in our case or EGARCH models). The majority of these studies analyzes the U.S. market (see for example Da, Engelberg, & Gao, 2015; Lee et al., 2002) but there are also research papers for Europe (e.g. Cibulskienė & Grigaliūnienė, 2010; Jansen & Nahuis, 2003) and Asia (e.g. Dash & Mahakud, 2013). The incorporation of sentiment as an additional risk factor in an international context can also be found, for example, by Schmeling (2009) or Baker et al. (2012) although they focus more on particular stocks (such as growth or value stocks) and not on aggregate country returns as in our case. Bathia and Bredin (2013) examine the influence of both survey-based and market-based measures of sentiment on the aggregate returns of the G7 stock markets which is similar to our work. However, as for most of the empirical sentiment papers, they only focus on sensitivities, i.e. betas and not on the corresponding risk premia. The purpose of the present paper is to address this gap in the literature therefore we do not only analyze whether sentiment is a significant source of risk on international stock markets. We also examine how this risk is compensated with expected return on the one hand and how this compensation varies over time on the other hand. To our

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