



HEDGE FUNDS

Betting Against Beta

January 1, 2014

A basic premise of the capital asset pricing model (CAPM) is that all agents invest in the portfolio with the highest Sharpe ratio, or expected excess return per unit of risk, and leverage or de-leverage this portfolio to suit their risk preferences.

However, many investors — such as individuals, pension funds and mutual funds — are constrained in the leverage that they can take, and therefore overweight risky securities instead. This behavior of tilting toward beta suggests high-beta assets require lower risk-adjusted returns than low-beta assets. Indeed, the security market line for U.S. stocks is too flat relative to the CAPM and is better explained by the CAPM with limited borrowing.

This raises several questions: What is the magnitude of this anomaly relative to the size, value and momentum effects? Is betting against beta rewarded in other countries and asset classes? How does the return premium vary over time and in the cross section? How does one bet against beta?

We address these questions by considering a dynamic model of leverage constraints and by presenting consistent empirical evidence from stock, bond, credit and futures markets in 20 countries. (We found relative flatness in 18 of 19 international equity markets, in many asset classes.)

We show how this deviation from the standard CAPM can be captured using betting-against-beta factors. The return of the BAB factor rivals those of all the standard asset-pricing factors — value, momentum and size — in terms of economic magnitude, statistical significance, and robustness across time periods, sub-samples of stocks and global asset classes.

This document is not intended to, and does not relate specifically to any investment strategy or product that AQR offers. It is being provided merely to provide a framework to assist in the implementation of an investor's own analysis and an investor's own view on the topic discussed herein.

This document has been provided to you solely for information purposes and does not constitute an offer or solicitation of an offer or any advice or recommendation to purchase any securities or other financial instruments and may not be construed as such. The factual information set forth herein has been obtained or derived from sources believed by the author and AQR Capital Management, LLC ("AQR") to be reliable but it is not necessarily all-inclusive and is not guaranteed as to its accuracy and is not to be regarded as a representation or warranty, express or implied, as to the information's accuracy or completeness, nor should the attached information serve as the basis of any investment decision. This document is not to be reproduced or redistributed to any other person. The information set forth herein has been provided to you as secondary information and should not be the primary source for any investment or allocation decision. Past performance is not a guarantee of future performance. Diversification does not eliminate the risk of experiencing investment losses.

This material is not research and should not be treated as research. This paper does not represent valuation judgments with respect to any financial instrument, issuer, security or sector that may be described or referenced herein and does not represent a formal or official view of AQR. The views expressed reflect the current views as of the date hereof and neither the author nor AQR undertakes to advise you of any changes in the views expressed herein.

The information contained herein is only as current as of the date indicated, and may be superseded by subsequent market events or for other reasons. Charts and graphs provided herein are for illustrative purposes only. The information in this presentation has been developed internally and/or obtained from sources believed to be reliable; however, neither AQR nor the author guarantees the accuracy, adequacy or completeness of such information. Nothing contained herein constitutes investment, legal, tax or other advice nor is it to be relied on in making an investment or other decision. There can be no assurance that an investment strategy will be successful. Historic market trends are not reliable indicators of

actual future market behavior or future performance of any particular investment which may differ materially, and should not be relied upon as such. Diversification does not eliminate the risk of experiencing investment losses.

The information in this paper may contain projections or other forward-looking statements regarding future events, targets, forecasts or expectations regarding the strategies described herein, and is only current as of the date indicated. There is no assurance that such events or targets will be achieved, and may be significantly different from that shown here. The information in this document, including statements concerning financial market trends, is based on current market conditions, which will fluctuate and may be superseded by subsequent market events or for other reasons.