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journal homepage: www.elsevier.com/locate/finmarMomentum lost and found in corporate bond returns [☆]Hwai-Chung Ho ^a, Hsiao-Chuan Wang ^{b,*}^a Department of Finance, National Taiwan University, and Institute of Statistical Science, Academia Sinica, Taiwan^b Department of Finance, National Taiwan University, No. 1, Sec. 4, Roosevelt Rd., Taipei 106, Taiwan

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ABSTRACT

In this paper, we propose an overreaction detection method to capture price reversals in the momentum cycle. Motivated by the absence of the momentum effect in investment-grade (IG) bonds, which is uncommon for most financial assets, we verify the method by showing significant improvements in the refined momentum portfolios of U.S. IG bonds from January 1994 to June 2014. The subsample of private or public firms and the relation to investor sentiment also indicate price momentum for both non-investment-grade (NIG) bonds and IG bonds. Our results carry important consistency implications for price continuations across financial assets and markets.

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1. Introduction

Although extensive studies have been conducted on testing the presence of momentum in many financial markets, little is known about momentum in the corporate bond markets. Only a few studies empirically find short- to intermediate-term reversals in the investment-grade (IG) corporate bond markets, raising questions regarding rational asset pricing models, as well as behavioral models. The aim of this paper is to re-examine the existence of price continuations in the U.S. corporate bond market and, more importantly, to prove a momentum effect in IG corporate bonds by incorporating an index to capture reversal risk. Based on the price underreaction and overreaction theory proposed by [Hong and Stein \(1999\)](#), we find that IG bonds underreact to news and provide momentum profits, if the possibility of corrections to the later price overreaction is taken into consideration.

The momentum effect emphasized in [Jegadeesh and Titman \(1993, 2001\)](#) has been widely exploited by investors to earn the cross-section of average returns that cannot be explained by the rational asset pricing model ([Fama and French, 1996](#)), resulting in a contradiction of the basic efficient market hypothesis ([Fama, 1970](#)).¹ After this, much effort has been made in

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E-mail addresses: hwaichungho@ntu.edu.tw (H.-C. Ho), d00723003@ntu.edu.tw (H.-C. Wang).¹ Under this hypothesis, investors should rationally update their beliefs according to all available information and make normatively acceptable decisions.

finding the momentum effect across different countries and financial asset classes² to support the consistent price behavior observed in equity markets. A branch of research also explores the various interpretations of the momentum profitability. Avramov et al. (2007) are among those who observe that the momentum anomaly is related to firm credit risk. Jostova et al. (2013) also find consistent results in corporate bonds.

Jostova et al. (2013) conduct a detailed study showing that momentum strategies generated abnormal returns in the U.S. corporate bond markets from January 1973 to June 2011. Their sample contains bonds of low credit quality, which were not often considered in earlier studies. The authors find that non-investment-grade (NIG) bonds can earn significant momentum returns that dominate the overall sample. They suggest that these returns are robust across bond characteristics and are not compensation for systematic risk. Furthermore, they argue that the momentum anomalies in bonds are not merely the result of spillover effects from equities, but they are also bond-specific.

In this paper, we focus on the issue of missing momentum among high credit corporate bonds rather than equities for two main reasons. The first reason is that the corporate bond markets are too large to ignore. The amount of worldwide outstanding debt securities was about US\$87.8 trillion at the end of 2014, which was larger than the total capitalization of the equity markets (US\$62.4 trillion) at that time. By country, the U.S. has largely dominated the bond markets, accounting for almost 41% of the total. Corporate bond debt is the second-largest category by size after Treasuries in the U.S. and it is about the same value as mortgage-related debt. Moreover, the average daily trading volume of U.S. corporate debt was US \$26.7 billion in 2014, an increase of approximately 50% over the past ten years, among which about 58% of the average daily trading volume consisted of IG bonds.³ IG bonds are regarded as a more common asset class than IG equities. The second reason is that credit risk is an important factor in bond pricing. As a matter of fact, unrated bond issuance is much less than unrated stock as a portion of the overall market. Most of firms in the U.S. use the corporate bond market as a main source of long-term funding, which induces firms to issue rated bonds to attract investors.

It is generally agreed in the literature that momentum strategies fail in IG bonds, but profit significantly in NIG bonds. Most of the studies even show strong reversal patterns in IG bonds.⁴ While the reasons are not always understood, this finding motivates us to investigate whether the absence of momentum in IG bonds is sufficient justification to conclude that IG bonds do not underreact to fundamental information because they are efficiently priced. In this paper, our answer to this question is negative due to the lack of consideration of the momentum cycle when the conventional momentum strategies are implemented.

Opinions in the literature diverge on the issue of corporate bond market efficiency. Corporate bond trades are mainly dominated by more sophisticated institutional investors (Bessembinder et al., 2009; De Franco et al., 2009; Ronen and Zhou, 2013), but they are also infrequent and incur higher transaction costs (Edwards et al., 2007). An increase in the number of informed traders speeds up the diffusion of private information, but a decrease in trading frequency slows it down. Corporate bonds may be more or less efficient than equities, depending on which situation dominates. By studying the lead-lag relation of price returns between different markets, some researchers suggest that there is an underreaction in bond prices relative to the same news incorporated in stock prices (Kwan, 1996; Gebhardt et al., 2005; Downing et al., 2009), but others document a similar information efficiency between bonds and equities, or even the predictive ability of bond returns for stock returns (Hotchkiss and Ronen, 2002; Bittlingmayer and Moser, 2014).

Rather than trying to study the relative information efficiency of the corporate bond and equity markets, we focus on the differences in the information diffusion between the two bond markets, IG and NIG bond markets, to account for the empirical findings that momentum is observed in equities and NIG bonds but not in IG bonds. Price momentum usually implies that the historical returns of a security can be used to predict the security's future performance and prices in the financial markets do not reflect all available information efficiently; but, instead, they convey the irrational behavior of investors.⁵

On the other hand, Hong and Stein (1999), who do not emphasize behavioral biases, claim that prices are driven by interactions between two groups of traders: newswatchers and momentum traders. Since private information owned by newswatchers is slowly incorporated into prices, this underreaction process generates momentum. Momentum traders then add to the momentum to profit from price continuations by conditioning based on recent price changes. Since momentum traders maintain the trend even after the end of the information diffusion, the prices reflect overreactions and eventually

² Early research on non-U.S. markets was conducted by Rouwenhorst (1998, 1999). Chan et al. (2000) examine the profitability of momentum in international stock market indices instead of individual equities, Okunev and White (2003) examine the momentum effect in the foreign exchange markets, and such an effect in the commodity futures markets is proven by Miffre and Lallis (2007). Moreover, Moskowitz et al. (2012) study time series momentum in various futures markets. Recently, Asness et al. (2013) investigate the momentum portfolios of individual stocks across countries and asset classes.

³ The data about the size of the debt markets (as of 2014) is from the websites of the Bank for International Settlements, the World Bank, the Securities Industry, and the Financial Markets Association (SIFMA).

⁴ One of the earlier papers exploring the asset price patterns in the U.S. corporate bond markets is that by Khang and King (2004). Unlike equities, their sample, which consists of IG corporate bonds from 1978 to 1998, shows strong reversals over the short to intermediate horizons. Similar results are found in Gebhardt et al. (2005). Pospisil and Zhang (2010) not only confirm the reversal effect in IG corporate bonds, but also show price continuations in high-yield bonds from 1998 to 2009.

⁵ Daniel et al. (1998) explain that the price momentum is generated by initial overconfidence followed by even greater overconfidence due to attribution bias. Barberis et al. (1998) argue that investors initially underreact to new information due to conservatism bias and then become overconfident due to representativeness bias.

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