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Do bond credit ratings lead to excess comovement?

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ABSTRACT

We investigate whether non-fundamental comovement results from investors using credit ratings to group assets into different "styles". We find that bonds that join a new rating class start comoving more with the bonds in this class, even when fundamental factors suggest otherwise. We show that this comovement effect varies according to the nature of the bond considered, and the modalities of the rating action. Downgrades have a larger impact than upgrades, and rating reviews matter as much as actual movements. Finally, rating changes between grades BBB and BB, which lead bonds to be reclassified as either "high-yield" or "investment grade" assets, seem to be of particular importance.

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1. Introduction

Financial crises occur when asset values grow in excess of "fundamentals". Preventing such crises thus requires distinguishing such fundamentals from "human" factors, notably from the "instincts" of investors. Yet this task has proven very difficult, as human and fundamental factors are often entangled. For instance, investors grow overconfident in good times and panic in bad times, which makes it difficult to empirically distinguish "real" growth from changes in risk aversion. Nevertheless some human features appear quite independent of fundamentals, which makes them easier to detect.

Our natural tendency to classify is one of those features. To reduce the complexity of the portfolio allocation problem and the cost of gathering information on each asset, investors classify assets into different groups according to their industries, size, book-to-market ratios, for example. The resulting classes are called "styles", and trading strategies based upon these classes are called "style investing". Style investing will lead assets to be bought and sold together as part of a similar style, which will create excess comovement between them.

The goal of this paper is to investigate the presence of such style-driven comovement over what is arguably the most followed classification scheme in the markets: bond credit ratings. We study the impact of downgrades/upgrades on the comovement of a bond with both the rating index it leaves and the one that it joins, controling for the influence of fundamentals. We find evidence supportive of style-driven comovement in bond ratings.

The paper places itself within a small but conclusive literature on style investing. An important contribution comes from Boyer (2011), who finds that stocks that are reclassified between growth and value indices according to their book-to-market ratio start comoving much more (less) with the index that they join (leave).[1] Vijh (1994) and Barberis and Shleifer (2005) find a significant rise in comovement for stocks that join the S&P500, while Greenwood (2009) obtains even stronger changes in betas when studying movements in and out of the Nikkei 225. Barberis and Shleifer (2003) also provide a theoretical model in which style investing leads a given style to exhibit momentum and mean reversion, in addition to the comovement effect.

More generally, the paper belongs to a wide and heterogeneous literature on movement in asset prices that results from "investor-driven" factors rather than fundamental factors. This includes, for instance, Froot and Dabora (1999) who find evidence of two stocks that refer to a similar cashflow but behave inde-

[1] To discard the possibility that the change in comovement simply reflects the underlying change in the book-to-market ratio, the author focuses on stocks that were reclassified as growth (value) even though their book-to-market ratio had risen (fallen). Such cases occur because the agency that classifies the stocks wants each index to represent 50% of total market cap.

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pendently, or Ye (2012) who suggests that comovement patterns change with the share of active investors. We may also relate this dichotomy to some models of financial contagion that predict that endogenous factors may drive correlations above their fundamental values (Raffestin, 2014).

Finally, the paper may also be linked to the literature on the impact of rating actions, although to the best of our knowledge, this literature has focused on prices rather than comovement. Studies such as Norden and Weber (2004) find a strong impact of rating actions on bond or stock prices. Micu et al. (2006) add that investors tend to react more to downgrades, and are as sensitive to outlook announcements as they are to actual rating actions.

The contribution of this paper is threefold:

1) *We focus on bonds*
   Style investing may be particularly strong in the fixed-income market, for several reasons.
   First, ratings are probably the most scrutinized classification on the markets. The recent financial crises have highlighted this importance. Downgrades of important nations triggered angered reactions at the highest levels during the European sovereign debt episode. Practitioners and academics agree that over-reliance on credit ratings played a large role in the subprime crisis, by fueling the building up of AAA graded CDOs.
   Second, external factors may give investors an incentive to "buy the grade rather than the asset" in the fixed-income market. From a regulatory perspective, ratings are an important input for computing capital surcharges in the Basel agreements. From an operational perspective, bonds are usually traded more as a way to diversify portfolio risk than to earn large returns. Thus, on average, investors may have less benefit from gathering idiosyncratic information on a given bond, compared to equities.
   Finally, casual observation strengthens our suspicions. The last 15 years have seen a large rise in the number and size of exchange traded funds (ETF) in the fixed-income market. ETFs constantly need to adapt to the index that they replicate. Therefore, we may expect them to buy and sell large quantities of assets, using some type of classification.
2) *We efficiently control for fundamental comovement*
   Our identification strategy is based on the following argument: low-graded bonds are on average more risky and thus should have larger market betas. Mathematically, a high market beta asset must comove more with any other bond or index than must a low-beta one. Therefore, from a fundamental perspective, following a downgrade, a bond should start moving more both with the index it leaves and the one that it joins. Conversely, an upgraded asset should see its comovement with both indexes fall.
   From a style investing perspective, however, a given bond should start being bought and sold as part of the index that it joins following a rating action. This implies that its comovement should rise with the class that it joins, and fall with the index that it leaves.
   This naturally leads fundamental factors and style investing to have opposite predicted effects in certain cases. In such cases, finding a total change in comovement that is consistent with style investing, and in contrast to fundamental factors, indicates that style investing is present.
3) *We provide a qualitative analysis of style investing by studying comovement across notches, types of bonds, and/or rating actions*
   First, we study whether rating changes between notches BBB and BB, which lead bonds to be reclassified as investment or high-yield bonds, have a particular impact on comovement. This distinction is extremely popular, and casual observation suggests that different types of investors operate in each ensemble, which could translate into a comovement premium. We find suggestive evidence that BBB/BB movements indeed have a larger-than-average impact.
   Second, we document a larger effect for downgrades compared to upgrades. We argue this comes from the fact that investors tend to turn away from downgraded assets, especially when they concern firms on which they have little information. This leads style investing to represent a large share of the demand for downgraded assets. We also find that the comovement effect of rating reviews is comparable to that of actual rating actions, consistent with the view that investors are quick to react to new public information.

Section 2 outlines the intuition behind the test that we conduct. Section 3 presents the data and how we implement the test. Section 4 provides results and robustness tests. Section 5 is dedicated to a more detailed analysis of the patterns of style investing in the fixed-income market.

2. Design of the test

We explain the identification strategy of the paper, which rests upon a simple economic/statistical argument. The reasoning is presented in words, but a model formalizing the logic is provided in appendix A.

2.1. The fundamental impact of ratings

As ratings are an economically meaningful classification, we expect the comovement within a rating class to reflect fundamental factors. In particular, ratings are an indicator of credit risk, and thus, we expect bonds of the same class to move together through their correlated discount factor. Different ratings may also signal different liquidity conditions, which should lead assets of the same risk class to have correlated liquidity premia. The dependence of bond yields upon economic activity and liquidity conditions has been established empirically, for instance by Lin et al. (2014).

The simple premise of our test is that lower-grade assets are by definition more fragile, and thus, their sensibility to such risk factors should be higher, on average. Therefore, *the exposure of a given bond to risk factors, such as credit or liquidity, should be rising on average as its grade decreases.* In other words, we expect low-graded bonds to have higher market betas.

Less "fundamental" factors may add to this larger yield response for lower-grade bonds. In particular a negative fundamental shock may increase the level of risk aversion of investors, leading them to lower their exposure to risky assets. Investors may also prefer to hold liquid assets, which tend to be safer in times of market turmoil. Laborda and Olmo (2014) show that investor sentiment does matter for bond pricing.

2.2. Fundamentals-driven comovement

Consistent with the above, let us assume that a rise in global credit risk drives up the yield spread of high-grade assets by 1% and that of low-grade assets by 2%. A 1% rise in the high-grade asset then corresponds to a rise of 2% in the low-grade asset, which implies that the beta of a regression of the low-graded asset j on the high-grade index will be 2. Conversely, the beta of the high-graded asset i on the low-grade index will be 0.5 (a rise of 2% in x results in a rise of 1% in y). The expected betas are summarized in the following table, with the independent variables in the columns and the dependent variables in the rows:

	high grade index	low grade index
high-grade asset	1	0.5
low-grade asset	2	1

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