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Credit Momentum added to Quant Equity Strategies

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- New addition to Momentum factor
- Building on Robeco's expertise in equities and credits research
- Added value on top of equity Momentum

We provide evidence for the existence of a momentum spillover from credits to equities, which we use to enhance traditional price momentum. A high-quality dataset allows us to study the international robustness of this effect, besides confirming recent academic work. From a strategic perspective it makes sense to look at a company-wide, combined momentum signal, as investors in different markets are likely to use different information on a certain company. We therefore add credit momentum spillover to the momentum factor in our stock selection models.

Since the start of our multi-factor stock selection models in the early nineties, the equity price momentum factor has been very important. All our quantitatively managed equity strategies include momentum as one of the factors. The finding that stock returns tend to persist over the medium term was documented decades ago, and subsequent research has aimed to understand this striking anomaly. The majority of that research focuses on equity markets, even though momentum is documented in many asset classes. In this note, we study how price information from other markets, in particular the corporate bond market, affects stock returns.

'Investors in different markets focus on different information of a company'

We show that not only equity momentum but also credit momentum has predictive power for equity returns. Companies with high medium-term bond returns tend to have higher stock returns in the subsequent month. Robeco's experience in quantitative corporate bond research goes back more than 15 years. Combined with Robeco's high-quality corporate bond research database, this enables us to study the international robustness of credit momentum's impact on equity returns, confirming and extending recent academic work.

Even though equity and credit momentum factors are positively correlated, both signals provide unique information, as the investors in both markets focus on different aspects of a company. The equity value of a company can theoretically increase without bounds, whereas the value of a corporate bond's future cash flows will be limited. As a result, equity investors typically focus more on the upside potential of a company, while credit investors focus more on the downside (avoiding default risk). We use these insights to enhance Robeco's quantitative equity strategies, by including credit momentum as a building block within the momentum factor as of the second quarter of 2017.

Momentum at a glance

The momentum effect was first documented by Jegadeesh and Titman (1993) in the US stock market. They show that winner stocks, which have shown strong performance in the recent past, on average tend to outperform other stocks. The opposite holds for loser stocks, whose weak returns tend to persist in the following months. Subsequent studies document this effect internationally (Rouwenhorst, 1998) and in other asset classes, for example in high yield credit markets (Jostova et al., 2013) and investment grade credit markets (Van Zundert, 2017).

Apart from a momentum effect within asset classes, there is also evidence that momentum has a spillover effect to other asset classes. Gebhardt et al. (2005) observe that when a firm's underlying abnormal equity returns are positive, subsequent bond returns tend to be positive as well. They argue that underreaction in the credit market to the information contained in past equity prices is a likely source of this effect, which is often dubbed (equity) momentum spillover. Robeco's credit selection models have been exploiting this equity momentum spillover since their inception in 1999.

A logical next question is whether the reverse also holds, that is, do equity investors underreact to information contained in past credit prices? Indeed, in a recent paper, Bittlingmayer and Moser (2014) show that within a sample of high yield bonds, abnormal price declines of bonds are likely to be followed by abnormal price declines in the corresponding stocks in the subsequent month. And one year later, Ben Dor and Xu (2015) create equity portfolios based on bond momentum looking back up to twelve months and show positive and significant returns, with lower drawdowns than traditional equity

momentum. These papers suggest slow diffusion of information between markets as a possible cause for the existence of the spillover effect, e.g. because investors specialize in certain types of information or because equity and credit markets are populated by different investors.

Building on Robeco's high-quality credit research database

Robeco's history in quantitative selection research goes back to the early nineties, when the first multi-factor equity models were developed. Our pioneering research on corporate bond markets followed at the end of the 1990s. This has evolved into a broad range of strategies in both quant equity and credit investing with over EUR 45 billion assets under management (as of end March 2017).

Because of our long history in credit research, we can make use of a rich global database containing detailed information on bonds in either Bloomberg Barclays U.S. or Euro Corporate Investment Grade or High Yield indices, going back to early nineties. The fact that bond data with such breadth and depth is much more difficult to obtain than equity data could be a reason why credit markets are relatively under-researched in the academic literature, making this research distinctive.

We carefully link credit information to the stock of the related company to study various cross-market effects, starting with momentum spillover. We observe that the data coverage is reasonably good: for the North American market, our database covers on average around 76% of the MSCI index market capitalization and for Europe around 69% of the MSCI index market capitalization over our sample period, increasing to 88% and 70% respectively at the end of our sample (December 2016).

Strong predictive power for credit Momentum spillover

We start our analyses by considering the stand-alone performance of a credit momentum spillover signal. For each month in the period from January 1994 to December 2016, we rank all stocks in our universe (MSCI constituents and liquid off-benchmark names) for which we have both stock and bond return data available over the past 12 months (resulting in approximately 800 ranked companies on average).

Table 1 reports the top-minus-bottom decile performance for a number of strategies. The first column confirms the traditional 12-month equity momentum (excluding the most recent month) effect in our sample, with high momentum stocks outperforming low momentum stocks by 10.4% per year. The second column presents the result for the credit momentum spillover effect. Information from credit markets also matters for future stock returns: stocks from companies with a high credit momentum, as defined by 12-minus-1 month excess return, outperform low credit momentum stocks by 5.8% in the subsequent month. The top-

minus-bottom outperformance is not as high as for equity momentum, but with a lower tracking error this leads to a similar information ratio.

Table 1: Annualized performance statistics of credit and equity momentum in predicting stocks returns (top-minus-bottom 10%) over the period 1994 to 2016.

Momentum source:	Equities	Credits	Credits	Credits	Credits
Lookback	12-1m	12-1m	12-0m	6-1m	6-0m
Outperformance	10.4%	5.8%	8.3%	5.7%	9.9%
Tracking error	19.7%	11.7%	11.8%	10.6%	11.0%
Information ratio	0.53	0.50	0.70	0.54	0.90

Source: Robeco Selection Research. Back-test performances of portfolios containing the top-minus-bottom 10% stocks per region-sector group based on equities and credit momentum with a one-month holding period. Based on companies in the Bloomberg Barclays Corporate US and Euro, Investment Grade and High Yield indices with equity coverage. Sample period: January 1994 to December 2016.

Most equity momentum strategies do not include the most recent month to avoid the short-term reversal effect. We therefore also investigate whether we observe such an effect for credit momentum spillover. Interestingly, Table 1 illustrates that including the most recent month of credit returns leads to a stronger spillover signal, as the outperformance increases from 5.8% to 8.3% per year for a 12-month lookback window, with an information ratio of 0.70. In other words, we observe that short-term credit returns correlate positively with future equity returns. Therefore the short-term reversal is absent in the spillover signal. In fact, inclusion of the most recent month of credit returns improves the spillover effect.

The last two columns in the table show the results for 6-1 month and 6-0 month credit momentum spillover respectively. We again observe strong results and a similar effect when including the most recent month, which shows the robustness of our findings. We see it as an advantage that credit momentum can incorporate company specific momentum over the past month, which lowers the correlation with equity momentum.

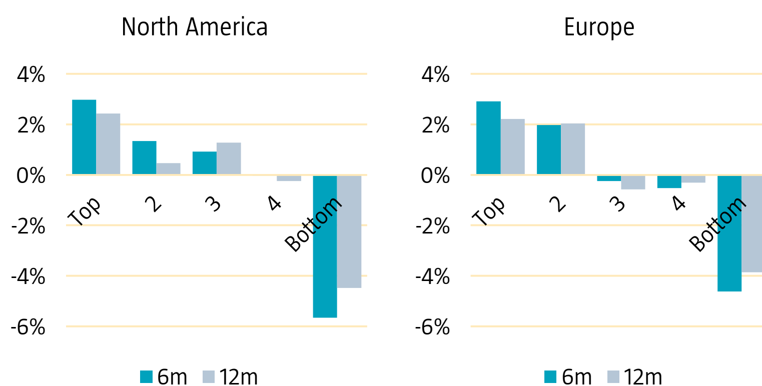
Out-of-sample evidence across regions

To the best of our knowledge, the academic evidence for the credit momentum spillover effect is limited to the United States. Our proprietary global credit database allows us to study the effect of credit momentum in European markets, as we have sufficient coverage in euro denominated bonds dating back to 2002. Our results, which can therefore also be seen as an out-of-sample test of the existing academic work, show that the credit momentum effect is also present in Europe.

Figure 1 shows the relative performance of 6- and 12-month credit momentum spillover of the quintile portfolios versus the respective universe within North America and Europe, the two regions with the highest historical coverage. We use quintile returns to keep the groups

well populated. In both regions, we see a top-minus-bottom return spread of around 8%. Although the top also outperforms the universe, the spillover signal seems to be more bottom-driven. Intuitively, this relates well to the higher focus on downside risk that is present in bond markets.

Figure 1: Annualized quintile performance of credit momentum in North America (1994-2016) and Europe (2002-2016).



Source: Robeco Selection Research. Performance of five equal-weighted quintile portfolios per sector based on 6- and 12-month credit momentum, with a one-month holding period. Based on companies in the Bloomberg Barclays Corporate US and Euro, Investment Grade and High Yield indices with equity coverage. The sample period for North America is January 1994 to December 2016 and for Europe is January 2002 to December 2016.

More than equity Momentum

The positive stand-alone performance of credit momentum spillover is encouraging, but the main question is whether credit momentum contains information beyond equity momentum. The existence of a momentum effect is frequently attributed to slow diffusion of information. It could well be that both equity and credit momentum capture the same pieces of information simultaneously, instead of unique information flowing from credit to equity markets.

In order to examine the added value of credit momentum spillover on top of traditional equity momentum, we present a Fama-MacBeth (1973) regression analysis in Table 2. For each month in the sample, we regress the individual one-month ahead stock returns on the past credit momentum values of a company and other characteristics, among which past equity momentum. We then average all coefficients over time and investigate whether these are statistically significantly different from zero by presenting the t-statistics. If the coefficient of a characteristic is significantly positive, this means that a higher portfolio exposure to this characteristic leads to higher expected returns. The advantage of using Fama-MacBeth regressions is that we can simultaneously control for multiple other factors that might affect the relation between credit momentum and stock returns. A positive coefficient for credit

momentum would thus imply that credit momentum contains value on top of these other factors.

Table 2 confirms that well documented factors such as value (BP) and equity momentum (Eq_12-1) are priced and lead to higher expected returns (positive and significant coefficient). Market risk (Beta) is not rewarded with higher returns, in line with the low-volatility effect. The first regression adds credit momentum (CR_12-0) next to other factors. We find that 12-month credit momentum has a lower coefficient than equity momentum, but it is highly significant. This indicates that the credit momentum spillover signal has informational content above that contained in traditional equity momentum. The second regression shows that this added value comes from both the most recent month (Cr_1-0) and the spillover signal over the rest of the past year (Cr_12-1).

We thus see that the added value is twofold. First, we now incorporate company-specific events in the past month in our momentum signal, without going against the short-term equity reversal factor. Second, by relying on different markets with different market participants, we can increase the informational content of a momentum signal.

Table 2: Fama-MacBeth regression analysis over the period 1994 to 2016

		Intercept	Beta	Size	BP	Eq_12-1	Cr_12-0	Cr_12-1	Cr_1-0
(1)	mean	1.71	-1.15	-0.78	1.32	2.62	0.86		
	t-stat	(0.32)	(-0.84)	(-1.66)	(2.24)	(2.57)	(3.20)		
(2)	mean	2.08	-1.07	-0.86	1.32	2.63		0.76	0.81
	t-stat	(0.39)	(-0.79)	(-1.86)	(2.26)	(2.56)		(3.36)	(3.16)

Source: Robeco Selection Research. Summary statistics of monthly Fama-MacBeth (1973) regressions of stock returns on credit momentum and other firm characteristics over the period January 1994 to December 2016. Regressions contain country-sector dummies. T-statistics are based on Newey-West standard errors incorporating 12 months lags. Based on companies in the Bloomberg Barclays Corporate US and Euro, Investment Grade and High Yield indices with equity coverage.

An enhancement of the Robeco Momentum factor

Based on all research findings, we add credit momentum spillover to the momentum factor of all our quantitative stock selection models of the Core Quant, Conservative Equities and Factor Investing strategies as of the second quarter of this year. By combining price information from stock markets as well as credit markets, we move towards a 'company momentum' signal. We have already seen that credit momentum adds to traditional momentum, and unreported results show the same for our residual momentum variable. This is confirmed by adding credit momentum spillover to our momentum factor, which leads to a slight increase in top-minus-bottom spreads. Insights from our price momentum factors, such as removing unrewarded risk factors at the variable level, are also applied to our definition of credit momentum.

We do acknowledge that not all stocks have credit data available. Due to the limited coverage, the effective weight for this factor in our equity selection models will be modest. Also for emerging markets, with 40% of the market capitalization covered in December 2016, we will use this unique source of information. The effective weight will increase with coverage. Even though the credit momentum factor does not have full coverage, it can help us make better investment decisions. The intuition here is that if two firms have similar equity momentum scores (and similar scores on the other existing model factors), we prefer the one that has a better credit momentum score.

Besides a good historical performance, we also see an advantage in signal diversification from traditional momentum variables, addressing overcrowding concerns. An investor who relies on both equity and credit momentum will buy different types of stocks than an investor solely using equity information. By incorporating credit momentum into our models, we distinguish ourselves even more from generic factor indexes or other managers that exploit momentum.

Conclusion

To summarize, we observe strong results for credit momentum spillover in predicting equity returns, on top of traditional equity price momentum. We therefore add the credit momentum spillover signal to the momentum factor in our stock selection models.

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