

The Quality of Low-Risk Credits

- Quality firms are safer, more profitable, and more conservatively managed; their bonds historically had higher risk-adjusted returns
- Quality is qualitatively and quantitatively similar to Low-Risk
- Quality variables have been in our factor models since inception

Patrick Houweling,
PhD
Jeroen van Zundert,
CFA
Frederik Muskens,
CFA
Mark Whirdy

Factor investing is a rules-based and evidence-based style of active investing that has rapidly gained popularity in recent years. Well-known and proven factors in the academic literature are Low-Risk (stocks or bonds with lower volatility), Value (securities that are undervalued vs. fundamentals), Momentum (recent outperformers), and Size (smaller firms). A more recent addition to the literature is the Quality factor. What constitutes Quality is less well defined than the other factors, but companies that are safer, more profitable, and more conservatively managed are generally perceived as high quality.

In this article we describe how we define and apply the Quality factor in our credit factor models. We show empirical evidence that Quality investing in credit markets is rewarded with higher long-term returns. Next, we argue and demonstrate that companies that score well on Quality tend to score well on Low-Risk too. In fact, some of our Low-Risk variables are called Quality variables by others. We provide empirical evidence that Quality and Low-Risk portfolios show similar behavior, but also that Quality has added value beyond Low-Risk. Finally, we describe how we have been using Quality variables in our credit factor strategies since their inception and how we have gradually expanded their use over the years.

What is Quality investing?

Although Warren Buffet is known as the ultimate Value investor, a recent study shows that his superior returns can in fact be explained by investing in stocks that are not only cheaper (Value factor), but also safer and of higher quality (Low-Risk and Quality factors).¹ The definition of Quality in this study is comprised of over 20 variables, grouped into four themes:

- profitability, e.g. gross profits, earnings, cash flow and accruals
- growth, e.g. change in gross profits and cash flow
- safety, e.g. equity beta, leverage and default risk measures
- payout, e.g. equity issuance and debt issuance.

Other academic studies investigated specific Quality variables, such as earnings quality (measured by accruals), profitability (measured by gross profits) and investments (measured by asset growth or equity growth).² Recently, several index providers have launched Quality equity indices, including S&P, MSCI and FTSE. Although these indices each have their own set of Quality variables, they all contain profitability measures and risk measures. From these academic studies and market indices it becomes clear that Quality is a less well-defined factor, which may encompass various themes. It also becomes clear that risk/safety/conservatism is often one of the Quality themes. At Robeco, we define high-quality firms as firms with high profitability, high earnings quality, and conservative behavior.

One may wonder why a Quality portfolio generates a premium versus the market. After all, who does not like profitable, cash flow-generating, well-managed companies? Academic researchers³ investigated two possible explanations: the risk view and the behavioral view. These studies concluded that a risk-based explanation is unlikely, because a Quality portfolio has lower volatility than the market and tends to outperform in market downturns. Therefore, a behavioral explanation is more likely: although investors are willing to pay up for stocks and bonds of high-quality firms, the market is underpricing these securities versus low-quality firms. Bouchaud et al. (2016) argue that “investors systematically underweight the information contained in Quality-like signals; they are too focused on other indicators such as Earnings per Share (EPS), even though the accounting conventions that lead to the calculation of EPS paint a less reliable picture than the cash flow statement”.

‘I like buying
quality
merchandise
when it is
marked
down’,
Warren Buffet

¹ Frazzini, Kabiller & Pedersen (2013) find that after controlling for the Value, Low-Risk and Quality factors – in combination with the use of leverage – the alpha of Warren Buffet’s strategy becomes insignificant.

² For accruals on equity markets, see Sloan (1996). For accruals on credit markets, see Crawford, Perotti, Price & Skousen (2015). For gross profitability, see Novy-Marx (2015). For investments using asset growth, see Fama & French (2015), or using equity growth, see Pontiff & Woodgate (2008). For an empirical comparison of various Quality measures see the recent paper by our colleagues Kyosev, Hanauer, Huij & Lansdorp (2016).

³ Assness, Frazzini & Pedersen (2015) and Bouchaud, Ciliberti, Landier, Simon & Thesmar (2016).

Corporate bond portfolio of Quality firms has superior Sharpe ratio

We evaluate the Quality factor over the period from January 1994 until December 2015 in the USD Investment Grade and USD High Yield corporate bond markets. In each month we compute per firm and per Quality theme (profitability, earnings quality, conservatism) a score and average them to get to a firm's total Quality score. Then we create five equally populated corporate bond portfolios based on this score: Q1 contains the 20% bonds of the highest-quality firms, Q2 contains the next 20%, and so on, until Q5, which contains the 20% bonds of the lowest-quality firms. Note that this does not mean that, for example, Q5 always contains loss-making firms. This will vary over time with the business cycle. Quality is a relative measure to assess whether a firm is more or less profitable than other firms. We use a holding period of 12 months. The returns⁴ and volatilities of each quintile portfolio are shown in Figure 1.

Figure 1 | Risk-return plot of Quality quintile portfolios for USD Investment Grade and USD High Yield



Source: Robeco, Barclays, FactSet. Sample period January 1994 – December 2015.

We observe that high-quality firms (Q1) have higher returns and lower volatility than low-quality firms (Q5). As a result, the high-quality portfolio has a much higher Sharpe ratio than the low-quality portfolio: 0.22 vs. -0.01 in Investment Grade and 0.37 vs. -0.01 in High Yield. Moreover, the five quintile portfolios display a monotonous increase in risk and a near-monotonous decline in return. This empirical evidence clearly shows that the Quality factor is useful in a factor investing framework, both in Investment Grade and in High Yield credits.

Quality factor compares well with other factors

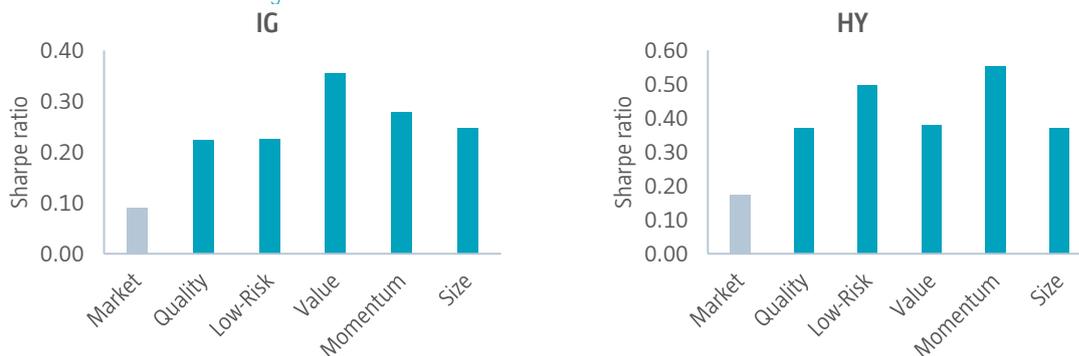
Next we compare Quality with other proven factors: Low-Risk, Value, Momentum and Size. These four factors were previously documented for credit markets.⁵ Figure 2 shows the Sharpe ratio of the top quintile portfolio for each factor, constructed using Robeco's

⁴ We use excess returns over duration-matched Treasuries to remove the interest rate component from corporate bond returns.

⁵ See our academic paper "Factor Investing in the Corporate Bond Market" (2014) or our white paper "Smart Credit Investing: Harvesting Factor Premiums" (2015).

enhanced factor definitions.⁶ The charts show that all factors indeed generated higher Sharpe ratios than the market. It also shows that the Sharpe ratio of the Quality factor is of similar magnitude as the Sharpe ratio of the other factors.

Figure 2 | Sharpe ratios of the market and top quintile Quality, Low-Risk, Value, Momentum, and Size portfolios for USD Investment Grade and USD High Yield



Source: Robeco, Barclays, FactSet. Sample period January 1994 – December 2015.

Similarity between Quality and Low-Risk: Comparing characteristics

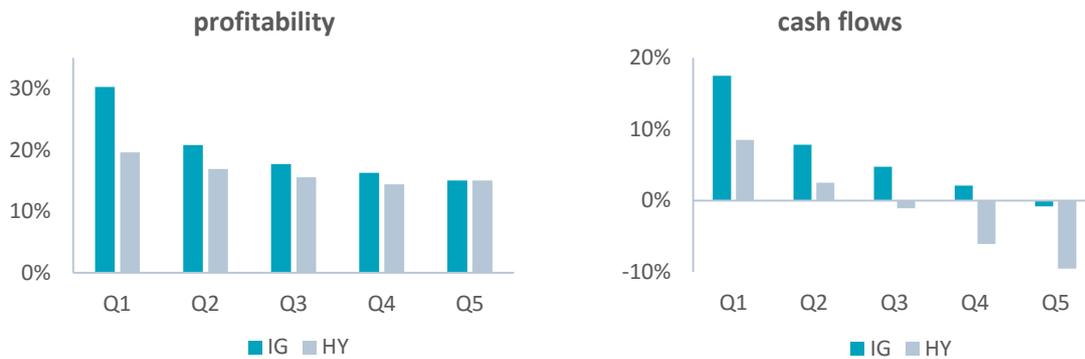
Above we described that safety is often part of the Quality factor definition, but clearly safety is also important in defining the Low-Risk factor. For instance, Quality has a preference for companies with low leverage, but this is also a useful variable to construct a Low-Risk corporate bond portfolio: firms that use less leverage tend to have lower default risk (as indicated by a higher credit rating). Leverage has been part of our Low-Risk factor ever since we started researching it.

Even without using overlapping variables in their definitions, it is intuitively clear that Quality is similar to Low-Risk. For example, Quality dislikes loss-making firms and it is not hard to imagine that unprofitable firms are also more risky. Further, Quality favors firms that are conservatively managed, e.g. firms that prefer redeeming their debts to aggressive investments. It is clear that debt reduction also reduces default risk.

We find strong empirical evidence for the intuitive similarity between Quality and Low-Risk when analyzing Quality-characteristics of Low Risk-sorted portfolios in Figure 3: the low-risk portfolio (O1) is invested in companies which are more profitable and generate more cash flows, and the high-risk portfolio (O5) contains firms which are less profitable and have lower cash flows.

⁶ For a fair comparison with the Quality factor, we only use *company* risk measures – and not *bond* risk measures - to construct the Low-Risk portfolios. Specifically, we do not take bond maturity into account, which is a proven and strong part of the Low-Risk factor. Also, for this analysis we have excluded the Quality variables from our Low-Risk definition. Therefore, the Sharpe ratios of the Low-Risk portfolios are lower than in our previous papers.

Figure 3 | Average profitability and cash flows for Low-Risk sorted portfolios for USD Investment Grade and USD High Yield



Source: Robeco, Barclays, FactSet. Sample period January 1994 – December 2015.

Similarity between Quality and Low-Risk: Comparing returns

Next, we provide evidence on the similarity between Quality and Low-Risk by analyzing returns. We already saw in Figure 1 that the lower the ranking on the Quality factor, the larger the realized return volatility. Hence, the Quality of a firm is predictive of the future volatility of its bonds.

To investigate the similarity more formally, we analyze the outperformance versus the market of the Quality and Low-Risk Q1 portfolios. In Panels A and B of Table 1 we first regress these outperformances on the market return. We observe that both factors generate statistically significant alphas. For Quality, the alphas are 0.49% for Investment Grade and 1.83% for High Yield, and for Low-Risk they are 0.44% for Investment Grade and 2.34% for High Yield. Moreover, Panels A and B show that the outperformances of both factors are negatively related to the market, because their market beta is negative. For Quality, the beta is -0.16 for Investment Grade and -0.17 for High Yield. For Low-Risk, the betas are more strongly negative: -0.26 for Investment Grade and -0.35 for High Yield. So, both Quality and Low-Risk typically outperform in a bear market and underperform in a bull market.

Finally, in Panel C we provide a direct comparison between the Quality and Low-Risk factors by regressing their outperformances on each other. We see that the betas are around 0.6 and that they are highly statistically significant. This is more evidence that the Quality and Low-Risk factors are similar. We stress that the factors are not identical, because the betas are not equal to 1. Furthermore, the alphas in Panel C are still sizeable: 0.21% for Investment Grade and 0.55% for High Yield. So, also after controlling for the Low-Risk exposure of Quality, it generates alpha. We do observe that the *t*-statistics are lower than the market-alphas of Panels A and B.

Table 1 | Panel A regresses the outperformance of Quality Q1 on the market; Panel B regresses the outperformance of Low-Risk Q1 on the market; Panel C regresses the outperformance of Quality Q1 on the outperformance of Low-Risk Q1; results for USD Investment Grade and USD High Yield

	Investment Grade		High Yield	
	α	β	α	β
A: Quality = α + β Market	0.49% (2.78)	-0.16 (-13.52)	1.83% (2.78)	-0.17 (-8.92)
B: Low-Risk = α + β Market	0.44% (2.75)	-0.26 (-24.14)	2.34% (4.18)	-0.35 (-21.08)
C: Quality = α + β Low-Risk	0.21% (1.52)	0.64 (21.55)	0.55% (1.00)	0.56 (15.49)

Source: Robeco, Barclays, FactSet. Sample period January 1994 – December 2015. Alphas are annualized. t-statistics are between parentheses.

To conclude, Quality and Low-Risk are both strong factors. We do see that they display similar behavior. Quality has added value beyond Low-Risk, but this is statistically weaker than the added value of both factors beyond the credit market risk premium.

Use of Quality and Low-Risk factors in Robeco's factor strategies

Because Quality and Low-Risk factors are both quantitatively and qualitatively similar, we combine them in a single Low-Risk/Quality basket in our factor models. So far, we have called this factor 'Low-Risk', even though it also contains Quality variables. For example, as mentioned above, leverage (which fits the safety theme of Quality) has been part of our Low-Risk factor since the inception of the factor strategies. In recent years, we have gradually added more Quality variables to the Low-Risk factor, such as profitability.

All our quantitative multi-factor ranking models contain the combined Low-Risk/Quality basket. The Robeco Conservative Credits strategy is tilted towards the Low-Risk/Quality factor and uses the Value, Momentum and Size factors as supporting factors. The Robeco Multi-Factor Credits strategy offers balanced exposure to all factors. Both strategies are driven primarily by quantitative models, with a fundamental overlay on non-quantifiable risks. The Robeco High Yield Bonds fund, on the other hand, is a predominantly fundamentally managed portfolio, in which we apply a multi-factor model to public small- and mid-caps. In all applications the use of Quality variables, next to pure Low-Risk variables, helps to tilt the portfolios towards safer, more profitable, and more conservatively managed companies.

Conclusions

Quality investing has recently become more popular in academic research and in the asset management industry, but there is no clear-cut definition of what Quality constitutes. We observe multiple themes being called Quality: safety, profitability, and conservatism, each theme being measured with multiple underlying variables.

What most Quality approaches have in common is an overlap with the Low-Risk factor. We find empirical evidence of this overlap, as Low-Risk firms tend to be more profitable and generate more cash flows. Moreover, part of the alpha of the Quality factor is subsumed by the Low-Risk factor, but not completely removed. Therefore, we see Quality as a natural extension of pure Low-Risk. In all our quantitative ranking models, we combine Quality with Low-Risk to tilt the portfolios towards safer, more profitable and more conservatively managed companies.

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