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Purified Momentum

An equity selection strategy based on a momentum signal produces a very good long-term performance but is negatively affected by sudden reversals of market trends (the variation in the strategy's exposure to specific risks is the main cause). Losses can be reduced by isolating factors responsible for these reversals and purifying the stock selection of these factors. In general, the purified momentum is based on a price trend that is independent of previously determined factor returns. The technique called "residualization" filters out these factors and keeps only the characteristic peculiar to the momentum (idiosyncratic)[i]. Blitz, Huij and Martens (2011) are the firsts to find a significant improvement in the Sharpe ratio generated by the residual momentum. They find this result on the US stock market by removing the effect of Fama and French factors: Beta, magnitude (SMB) and value (HML). Drawing on their research, we tested this technique on the Canadian stock market.

The energy and materials sectors and more specifically the oil and mining (gold) companies make up a large portion of the Canadian market and the S&P/TSX Composite Index. The reversals in price trends associated with the commodities of these sectors (CL1 for oil companies and GC1 for gold) being difficult to predict, it is interesting to neutralize their effect on stock selection in Canada. Essentially, this implies selecting stocks that have a strong positive trend regardless of the price trend of oil or gold.

Table 1

	Period 2000-2017	Annualized Cumulative Returns	Standard Deviation	r/σ
Purified Momentum (PM)	CL1	10.8%	13.5%	0.83
	GC1	11.1%	16.5%	0.72
	Beta	10.2%	17.6%	0.61
	CL1 & Beta	10.8%	16.7%	0.70
	CL1, GC1 & Beta	11.5%	15.8%	0.67
S&P/TSX Composite		3.1%	13.6%	0.29
Momentum 12M-1M		3.4%	17.5%	0.28

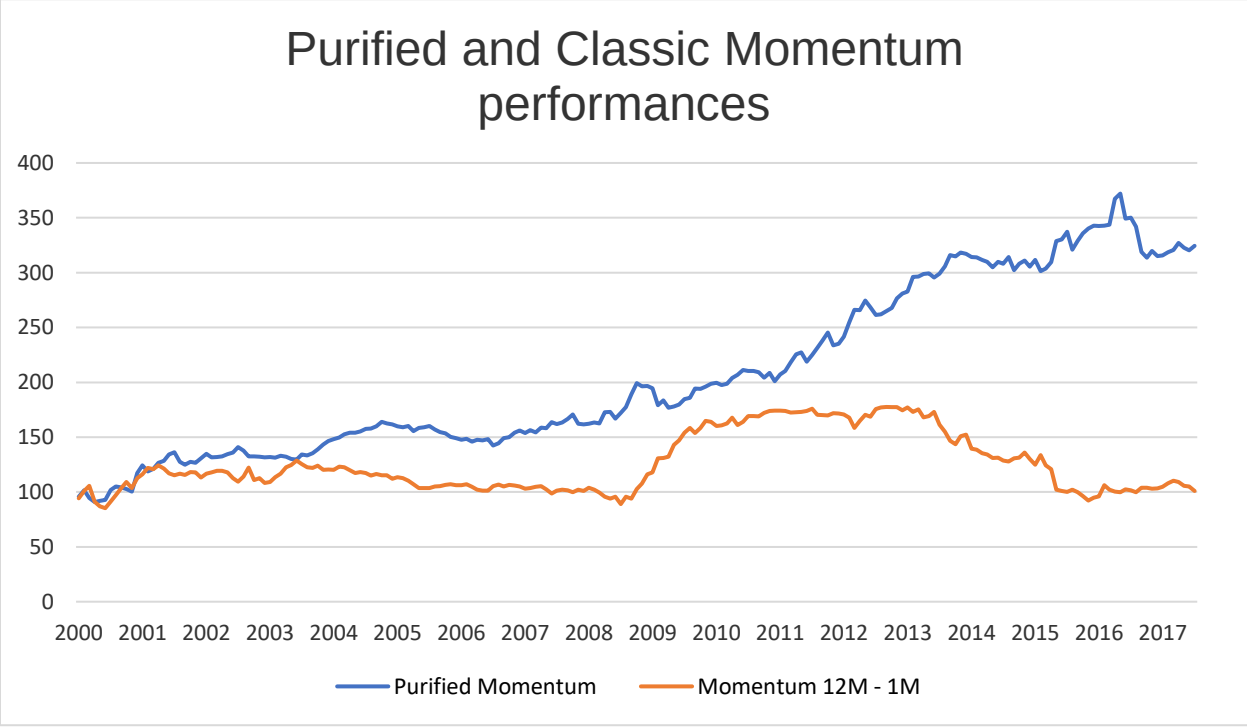
Table 2

		r/σ		
		1st period 00-08	2nd period 09-17	Total period 00-17
Purified Momentum (PM)	CL1	0.64	1.09	0.83
	GC1	0.61	0.87	0.72
	Beta	0.51	0.86	0.60
	CL1 & Beta	0.50	1.09	0.70
	CL1, GC1 & Beta	0.54	0.98	0.67
S&P/TSX Composite		0.07	0.64	0.29
Momentum 12M-1M		0.13	0.43	0.28

Table 1 presents the annualized cumulative returns, standard deviations and Sharpe ratio[ii] for each of the strategies as well as for the S&P/TSX Composite Index. The purified momentum selection universe includes the 150 stocks with the largest market capitalization listed on the S&P/TSX Composite. The strategy is rebalanced monthly and the selected securities are held for three months. There is a clear improvement in the returns generated by the purified momentum compared to the index and the classic momentum signal. While the index achieves a return of 3.1% over the period, the purified momentums generate performances of around 11% per year. In a similar manner to Blitz et al. (2011)[iii] the strategy boosts Sharpe ratios by a factor of 2.

Table 2 shows the Sharpe ratios for different periods of the S&P/TSX Composite Index as well as purified momentum generated using different factors. The periods used to identify trend changes are as follows: 2000-2008, 2009-2017 and 2000-2017. The financial crises of 2000 and 2008 weigh negatively on the returns of the first period which is reflected by the weakness of its Sharpe ratios. In most cases, the oil price filter generates the highest Sharpe ratio. Comparing the purified momentum with the classic momentum strategy (12M-1M), we observe a clear improvement of the returns per unit of risk. The neutralization of oil prices seems to have the greatest positive impact on the strategy.

The following chart shows the excess returns (yields less treasury bill rates) of the purified momentum (CL1) and the classic momentum strategy (12M - 1M). A trend favoring purified momentum is observable from 2011.



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[i] The purified momentum is represented by the following equations:

(1) $R_{i,t} - R_{f,t} = \alpha_i + \sum_{f=1}^{N} \beta_f \cdot R_{f,t} + \epsilon_{i,t}$, for $t = [t_0 - 36, \ \dots, \ t_0 - 1]$

(2) $MR_{i,t} = \sum_{t-12}^{t-2} \epsilon_{i,t} \Big/ \sqrt{\sum_{t-12}^{t-2} \left(\epsilon_{i,t} - \bar{\epsilon}_{i,t}\right)^2}$

[ii] Blitz, D., Huij, J., & Martens, M. (2011). Residual momentum. Journal of Empirical Finance, 18(3), 506-521.

[iii] The Sharpe ratio of a security is defined as the average return in excess of the Treasury bills rates on its standard deviation. It is an indicator of profitability based on risk. A high ratio indicates an effective selection.