# Predicting Chinese Stock Returns

## The Largest Single-Factor Study of China's Stock Markets

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# Introduction

China's equity markets, the second largest in the world, have long confounded Western investors. Outside observers paint China's stock markets as a casino, where picking stocks requires as much skill as roulette, and investors avoid the country in their portfolio allocations. Patterns exist, however, if you know where to look.

In their paper, "On the predictability of Chinese stock returns" Chen, Kim, Yao, and Yu – a collaboration of finance professors from US and Chinese universities – examined 18 firm-specific variables known to predict stock returns in the US and their accuracy in predicting stock returns in China. The authors note that their study fills the gap in a Chinese asset pricing literature that focuses only on "a small set of predictive variables." By comparison, this analysis documents the predictive power of a list of over 400 factors, the largest single-factor study of China's stock markets.

This whitepaper begins by summarizing the dataset followed by a few intuitions about China's stock markets. We then delve into a top-performing factor from the dataset, followed by an exploration of how China-specific quirks in liquidity and short sale constraints impact factor returns. Finally, you will find an appendix documenting the returns of every factor we examined.

# Factor Summary

The DataYes China Equity Factors dataset includes 14 classes of factors determined by factor type and data source. Factor classes include moving average, profitability quality, trend, and solvency. Each class includes between 12 and 60 factors, which are updated daily.

| CLASS | COUNT | TYPE | EXAMPLES |
|---|---|---|---|
| Overbought Oversold | 60 | Technical | RSI, KDJ |
| Derive | 40 | Fundamental | EBITDA, Revenue TTM |
| Profitability Quality | 37 | Fundamental | ROE, ROA |
| Return | 35 | Technical | Beta, Alpha |
| Volume | 30 | Technical | Klinger Oscillator |
| Trend | 28 | Technical | Hurst Exponent |
| Per Share Indicators | 24 | Fundamental | EPS |
| Solvency | 24 | Fundamental | Quick Ratio |
| Valuation and Size | 22 | Fundamental | PE, Total Assets |
| Cash Flow | 17 | Fundamental | Cash Flow to Price |

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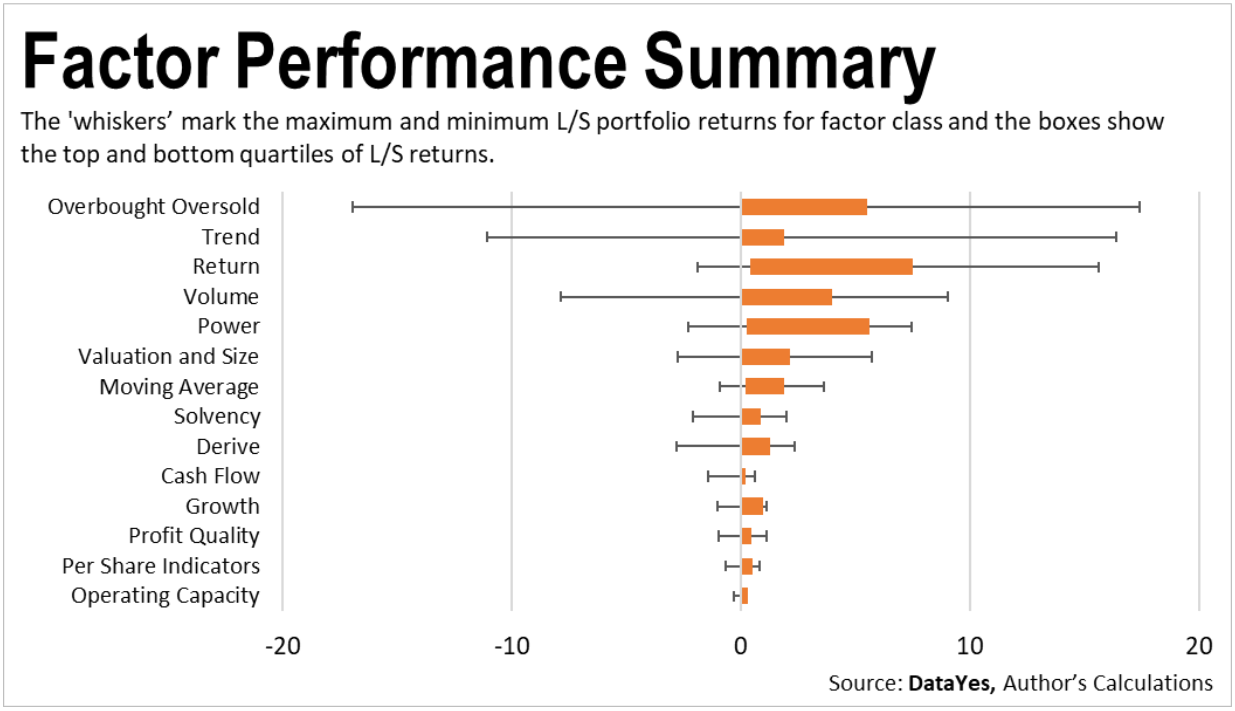
|---|---|---|---|
| Moving Average | 16 | Technical | N Day Exponential Moving Average |
| Growth | 15 | Fundamental | Net Assets Growth Rate |
| Power | 14 | Technical | Elder-Ray Index |
| Operating Capacity | 12 | Fundamental | Accounts Receivable Turnover Ratio |

To evaluate factor performance, we create ranked decile portfolios, which we back-tested over a six-year period, rebalanced monthly. In other words, we calculated 'long-short portfolio' returns by ranking all stock by factor values each month, and constructed a portfolio long the top decile of stocks and short the bottom decile of stocks.

The chart below summarizes DataYes Equity Factor performance by class. Specifically, the chart is a box-and-whisker plot showing the minimum, maximum, and top and bottom quartile of monthly returns for a long-short portfolio constructed using every factor in the dataset. The lines represent the maximum and minimum L/S returns, while the boxes depict the top and bottom quartiles of L/S returns. Wider boxes and 'whiskers' means that more factors within the class offer predictive power of future stock market returns.




From the chart, we can see that fundamental factors underperform technical factors when rebalanced monthly. For example, the L/S portfolios based on factor classes that reflect balance sheet and income statement data (e.g. operating capacity, profit quality, cash flow) generated monthly returns only comparable with the market return. Conversely, technical factors did quite well. Many L/S portfolios based on factors from the technical classes (e.g. overbought oversold, trend, return), generated monthly returns of over 10%.

This intuition will come as no surprise to experienced Chinese investors given that the country's stock markets are populated primarily with retail investors. For investors looking for factor constructions that

yield the best return, the included appendix lists L/S returns for every factor in the DataYes China Equity Factor dataset.

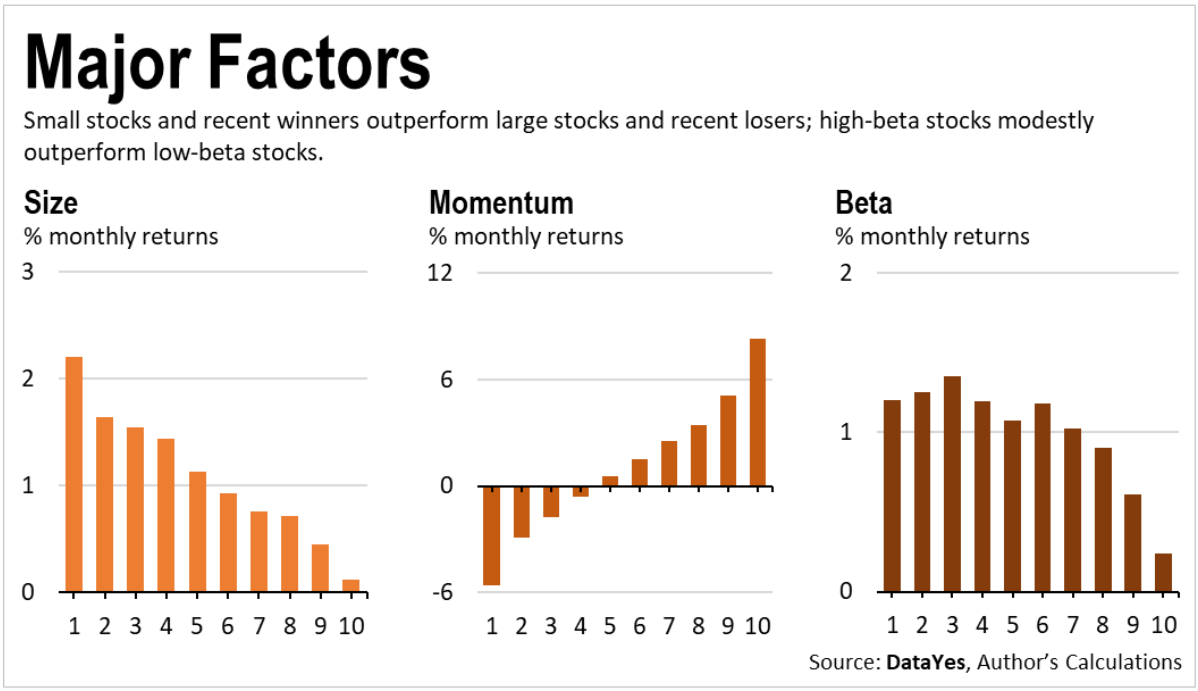
In the next section, we review basic intuitions about China's stock markets, and challenge the assumption that stock prices move unpredictably.

# Intuitions about China's Stock Markets

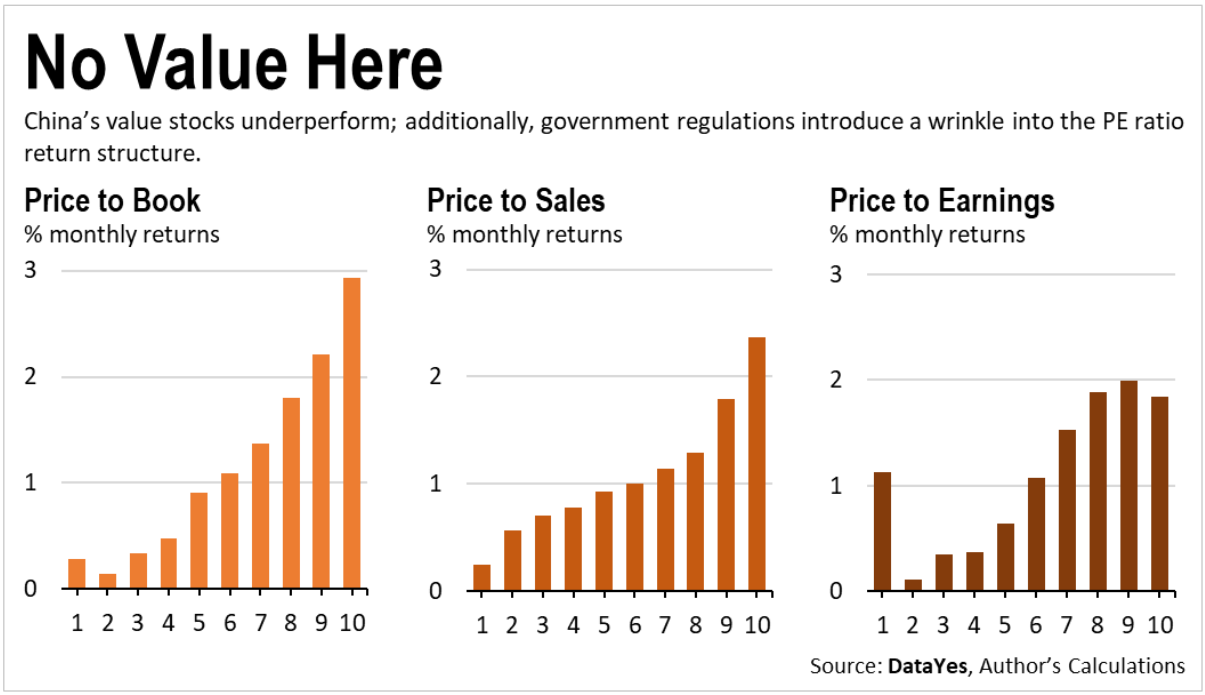
Western observers commonly compare China's stock markets to a casino, where stock picking requires as much skill as a turn at the roulette wheel. While it's true that, the 'house' always wins in China, several observable patterns in stock prices exists.

Our analysis begins by studying the performance of a few well-known factors for predicting future returns. This includes the size effect, where small stocks outperform large stocks; the momentum effect, where recent winners continue to outperform; and the beta effect, where high-beta stocks outperform low-beta stocks. See the end of this section for a glossary defining factor construction.

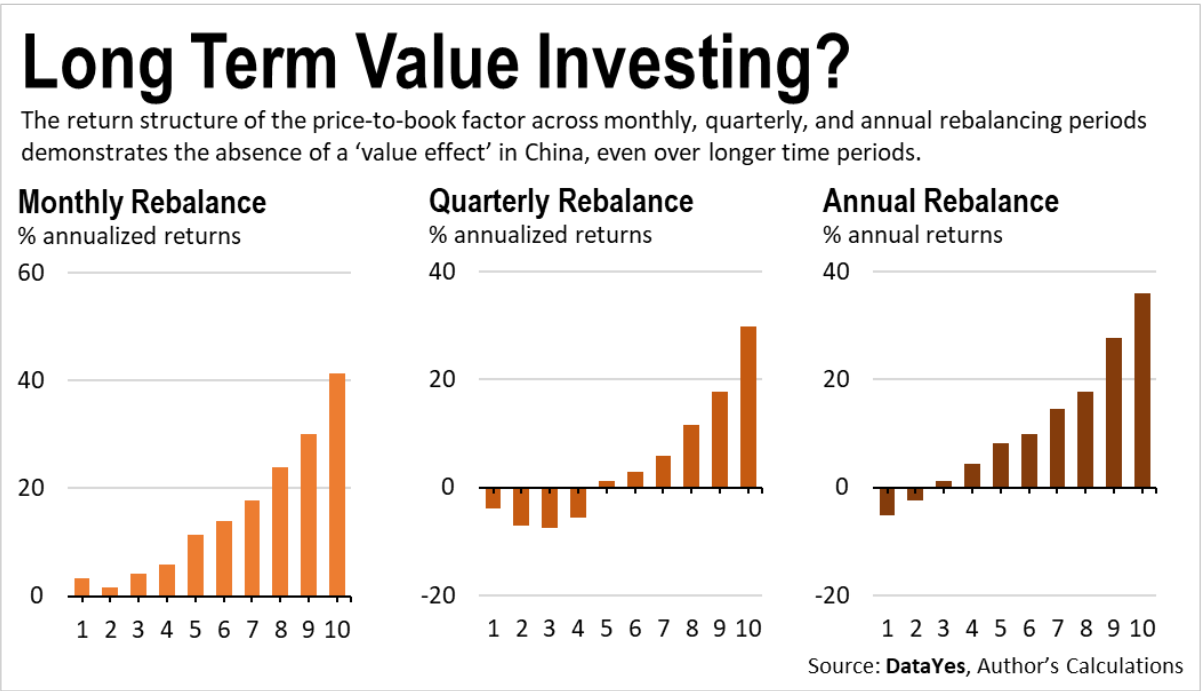
Our research found that small stocks and recent winners consistently perform the best in China's stock markets. We also found that high-beta stocks underperformed low-beta stocks, though modestly.




Although Chinese investors worship Warren Buffett, there isn't an obvious case for value investing in China's public equity markets. In fact, the most expensive stocks, by measures such as price-to-book or price-to-sales, often outperform their cheaper counterparts. We don't believe that this implies an "inverse" value effect, but rather that momentum and size effects swamp out the value effect, which we will examine later in this paper.

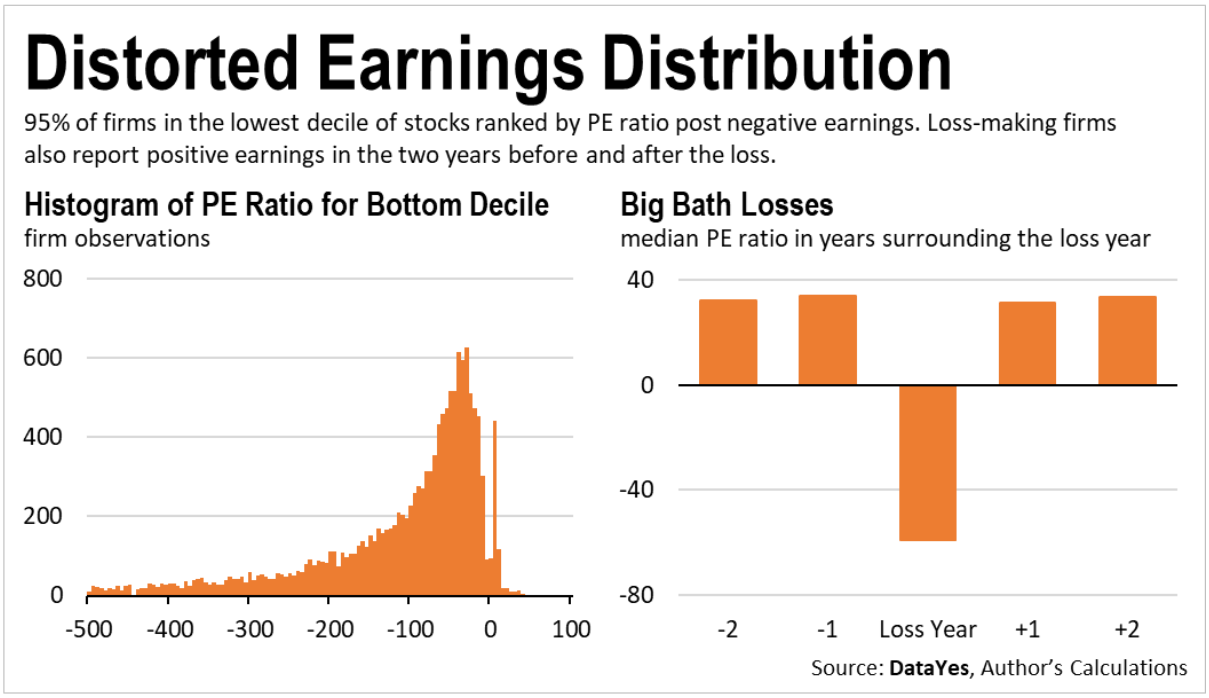


Critics may argue that value investing does not produce returns monthly. We therefore back-tested the value class of factors using quarterly and annual portfolio rebalancing – limited data history precluded longer rebalancing periods. Even then, value factors fail to generate returns consistent with a 'value effect' in China. In fact, the return structure for the price to book factor is remarkably consistent across rebalancing periods.




As you can see, the price-to-earnings factor produces a return structure with a wrinkle on the low end indicating that the cheapest decile of stocks outperformed each of the next five deciles. This pattern may appear spurious, but is a predictable distortion caused by government intervention.

Specifically, the CSRC delists firms posting three consectutive years of losses which incentivizes firm management to book multiple years of losses in a single accounting year. This explains why 95% of stocks in the lowest decile of price-to-earnings post negative earnings, and the tail is much fatter than implied by a normal distribution or in comparison to US markets. Additionaly, bottom-decile firms posted positive earnings in the two years perfious to and following their loss-making year. Local market participants are aware of the accounting legerdemain employed by firm management in response to the CSRC regulation, which explains why the news of massive losses does not meaningful impact stock price.




The left side of the chart above shows the distribution of PE ratios for all firms in the lowest decile. Take special notice of the discontinuity around a PE ratio of zero, which reflects firms massaging earnings to avoid losses, and subsequently booking *giant* losses when one is unavoidable.

The right side of the chart shows the median PE ratio in the years surrounding the loss year. For all firms that posted negative earnings, we calculated the median PE ratio for not only the loss-making year, but also the two years before and after. Notice how profitable firms are suddenly unprofitable and then bounce right back. This points further to the predictability of the effect caused by the CSRC delisting requirement, and explains the wrinkle in return patterns.

Although China's stock markets behave differently from developed markets, stock prices do not move randomly. Patterns govern the behavior of stock prices in China.

| FACTOR | DEFINITION |
|---|---|
| Size | Natural log of total assets |
| Momentum | Current stock price divided by last year's stock price |
| Beta | Beta relative to the CSI 300 index |

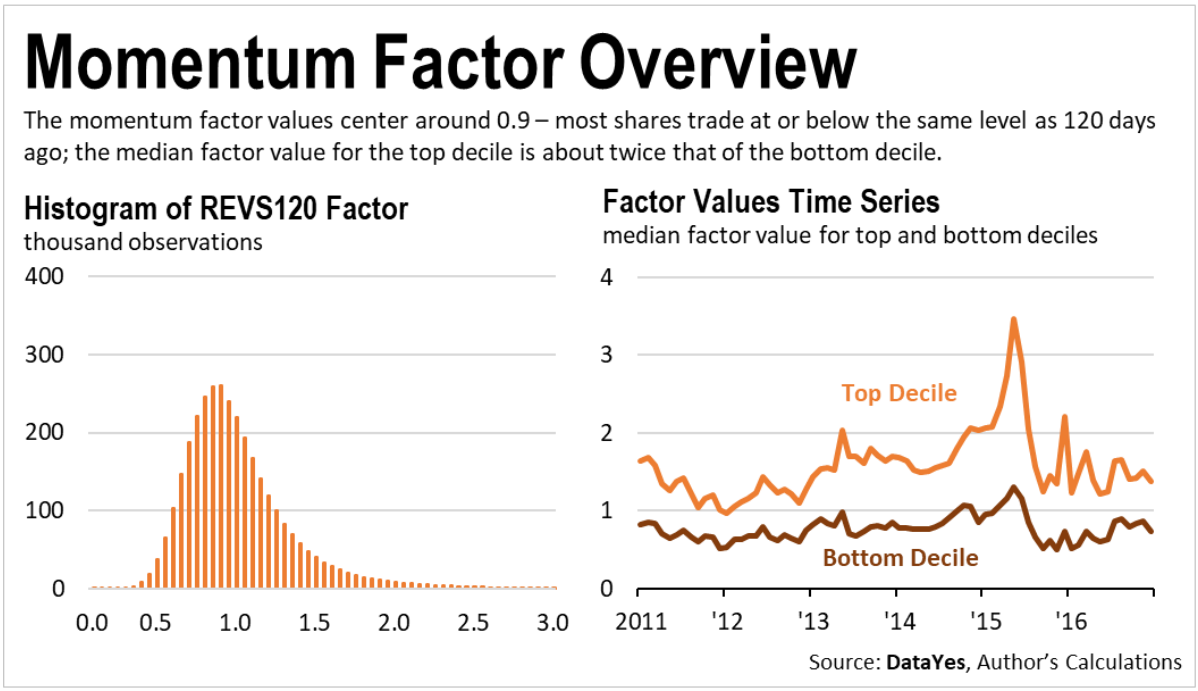
# A Detailed Look at Momentum

Given that China's stock markets are populated primarily by retail investors; therefore, it comes as no surprise that momentum factors generate the largest returns in our single-factor study.

## Overview

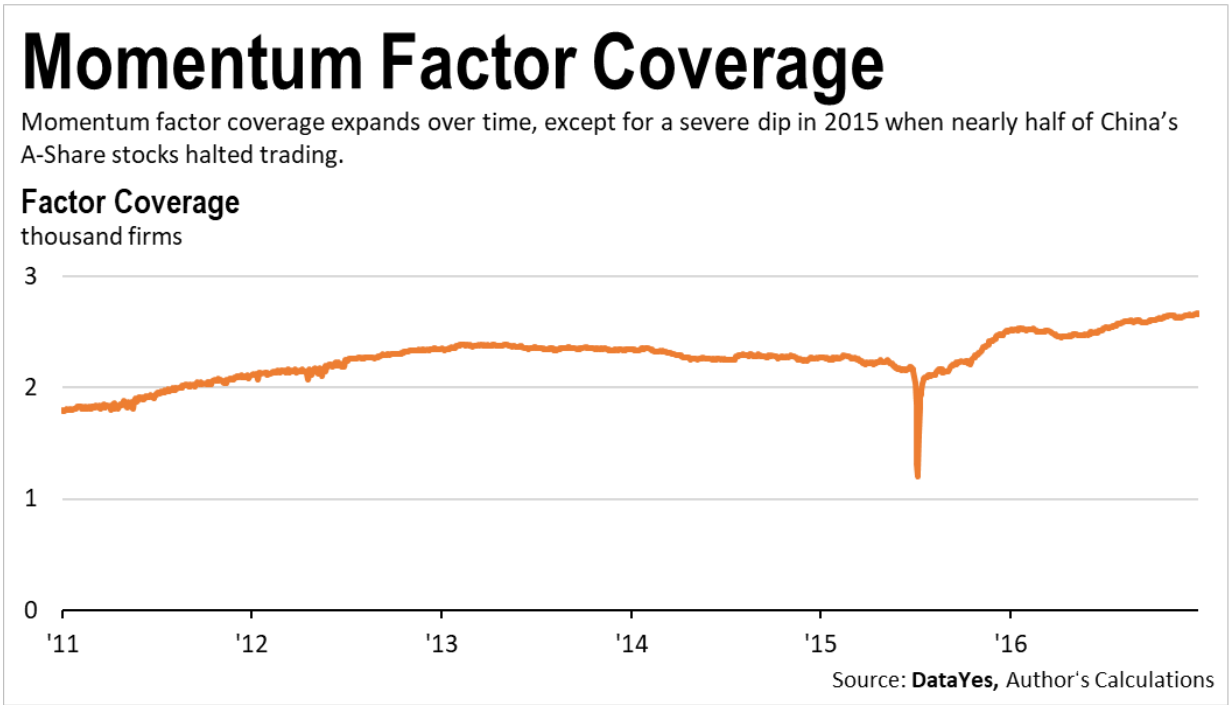
In this section, we will examine the REVS120 factor, hereon referred to simply as the 'momentum factor.' The momentum factor calculation is the ratio of today's closing price to the closing price from 120 days ago. For example, if the price today was 20 yuan per share and the price six months ago was 10 yuan per share, then our momentum factor value is 2.

The factor distribution centers around 0.9 and exhibits right skewness. Also note that the median values for the top and bottom deciles of this factor spike during the 2015 stock market bubble.




## Coverage

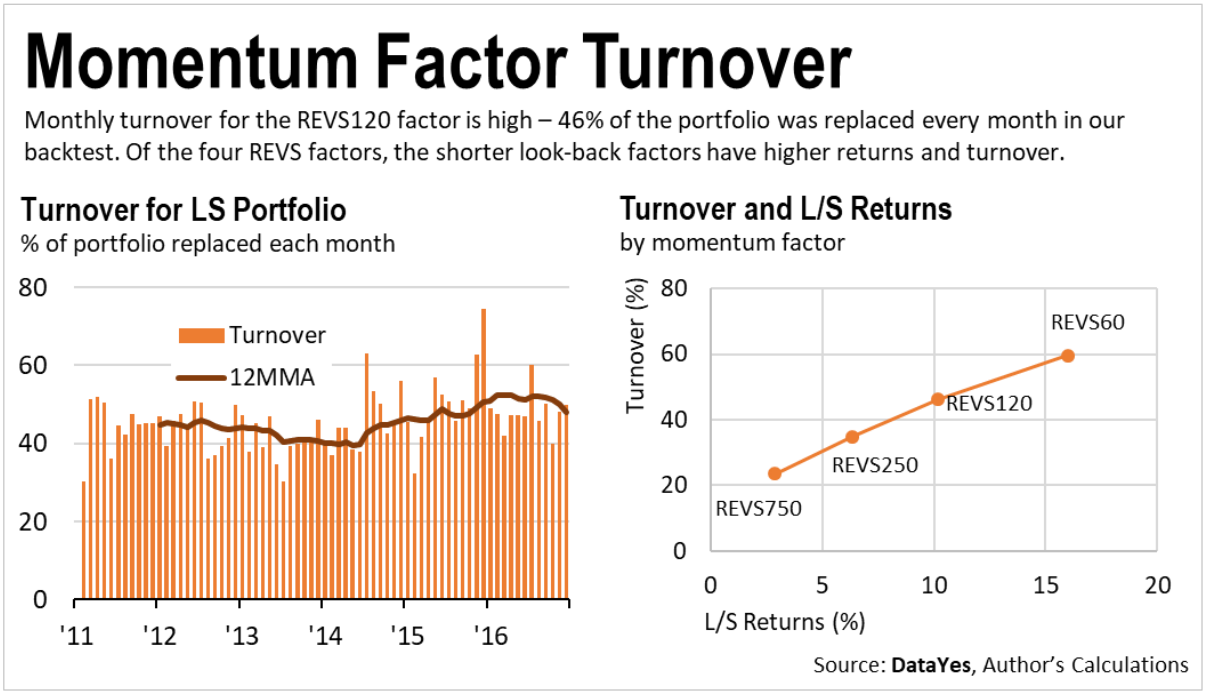
Coverage for the momentum factor exhibits a few quirks. First, coverage is expansionary. As the number of listed companies grows, so does coverage of the momentum. Second, trading stops impact coverage. For example, coverage cratered in the week beginning on July 8th, 2015 during an event when nearly 50% of all listed companies halted trading. Third, the factor doesn't cover all listed companies, just those with at least 120 days of trading history.



## Transaction Costs

Although momentum factor L/S portfolios generated high monthly returns, we must also consider the transaction costs associated with this strategy, given that monthly turnover for those portfolios was 46%.

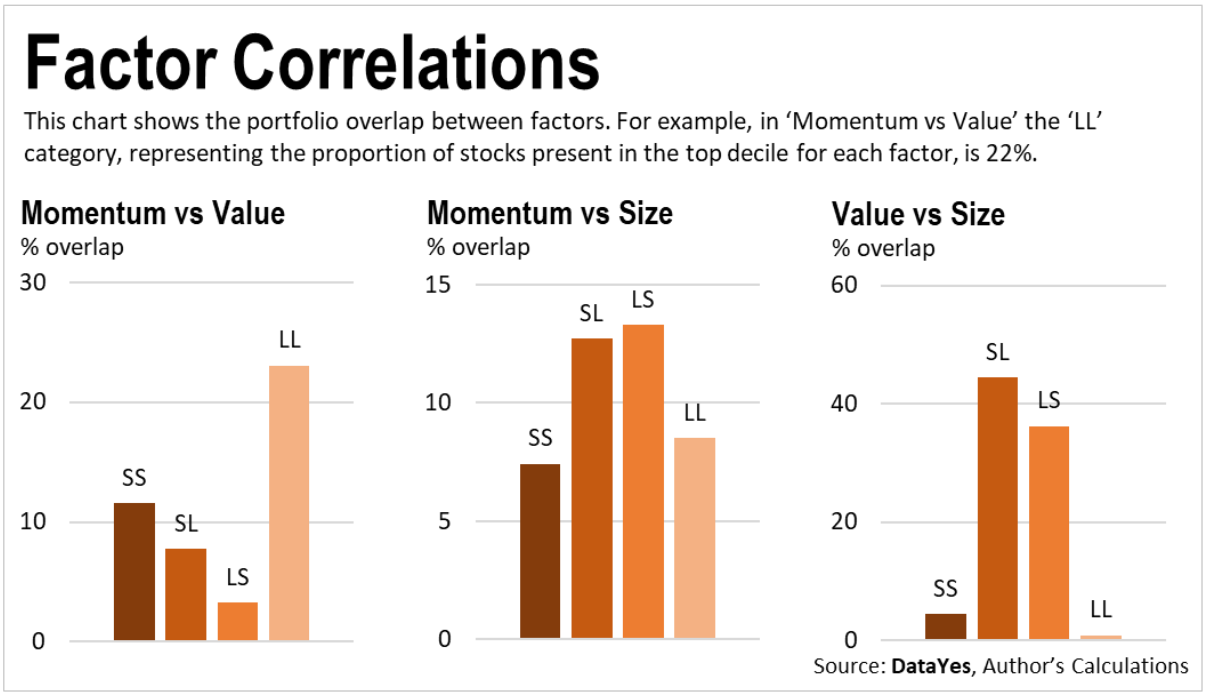
Some momentum factors better control transaction costs than others, however. For example, the REVS750 factor (calculated as today's stock price divided by the stock price from 750 days ago) generated monthly returns of 2.8%, but requires a monthly turnover of only 22%. Generally, momentum factors constructed with a longer lookback period generated lower returns but also required less turnover.




## Correlations

To understand the performance of trading strategies in China's stock markets, we must consider how the factors correlate to each other. For example, how many securities populate both the momentum and price-to-book L/S portfolios?

The momentum factor correlates with both the value and size factors. As you can see in the chart below, there is significant overlap in the portfolios constructed using each pair of factors.




This chart notates the overlap between each leg of the L/S portfolios for the factor pair in question. 'S' stand for short and 'L' stands for long, so, 'SL' means the short decile of the first factor and the long decile of the second factor. The column height represents the percentage of stocks in the short portfolio of the first factor that also populate the long portfolio of the second factor. A higher value indicates more overlap in the portfolios, and therefore higher correlation between the factors.

The correlation between momentum and value factors were relatively mild. From the chart, we see that the 'LS' overlap is only 3% while the 'LL' overlap is 22%. That is, only 3% of stocks in the top decile for momentum (recent winners) also populate the bottom decile for value (the cheapest stocks), and 22% of stocks in the top decile for momentum also populate the top decile for value (the most expensive stocks). This explains what appears to be the 'reverse value effect' mentioned earlier.

Value and size factors, on the other hand, exhibit very high correlation with each other. Cheap stocks are also overwhelmingly large stocks. 43% of stocks in the short decile for value (the cheapest stocks) populate the long decile of the size factor (the biggest stocks). Granted, the 'long' designation here is confusing as a portfolio constructed using the size factor would be short the largest stocks. Further, 38% of stocks in the long decile for value (expensive stocks) populate the short decile of the size factor (small stocks).

# Liquidity and Short Sale Constraints

The Chinese and US stock markets differ in several important ways. Chief among them, liquidity issues and short sale constraints both severely impact trading strategies in China's stock markets.

## Liquidity

Trade halt rules uniquely complicate liquidity concerns. The main issue is a lack of clear rules governing how and when Chinese companies can halt the trading of listed shares, a phenomenon which gained Western media attention during the 2015 stock market crash. On one day, nearly 50% of all listed shares halted trading, citing vague reasons such as 'asset restructuring' when in fact, the firms were hoping to arrest stock price declines. Even now, as many as 8% of China's listed companies will halt trading on any given day. Any systematic trading strategy must account for this.

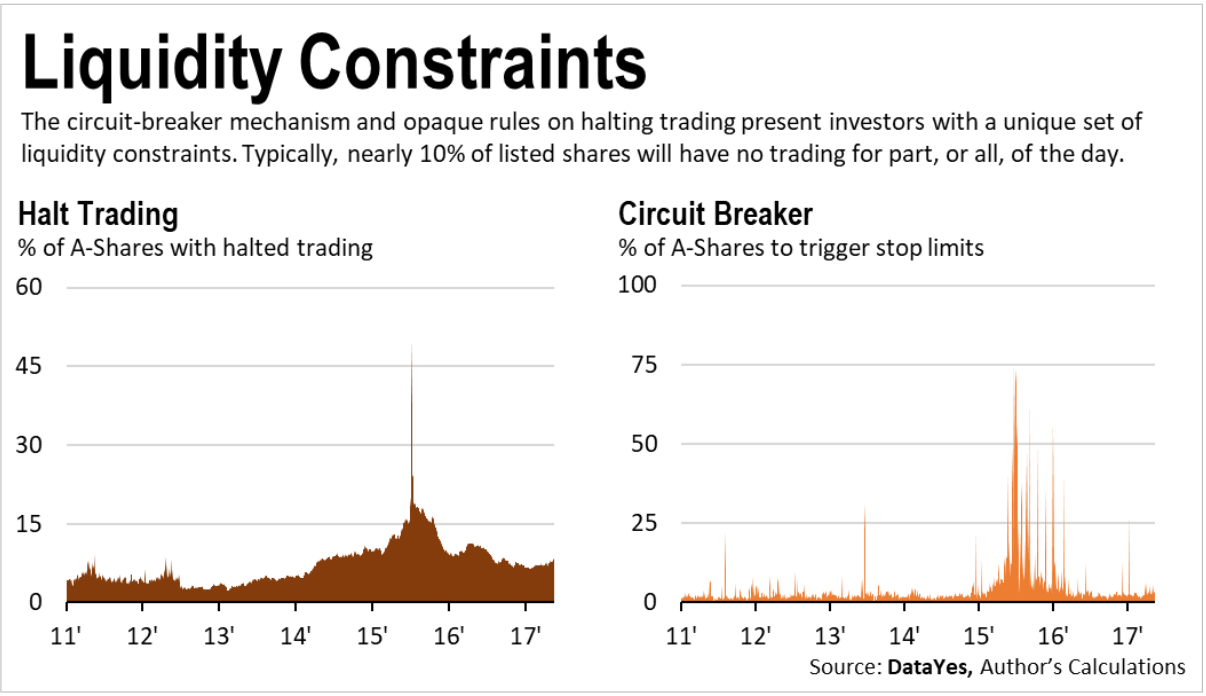
The 'circuit breaker' mechanism is another challenge for investors. Observers of China's markets may remember the January 2016 experiment with a market-wide circuit breaker that would shut down trading if the market moved by more than 5% or more in one day. The mechanism's introduction

provoked a 'magnet effect.' Prices lurched into the stop levels, exacerbating market volatility. Markets tanked for four days before the regulators reversed the policy.

However, a circuit breaker mechanism remains for individual shares. A stock price can move by no more than 10% on a given day before triggering an automatic stop. Although this mechanism is intended to dampen volatility, it's efficacy is debatable and it has produced some interesting second-order effects.

For one, new IPOs in China are required to price shares below a 22 P/E ratio. Given that the median P/E ratio of China's listed firms is 51, and only 25% of shares have a ratio under 22, a ceiling of 22 forces the dramatic underpricing of almost every new IPO. A common phenomenon is that a company's shares will, after listing, trade limit-up every day with virtually no trading volume until the stock price approaches its true market value. Incidentally, an IPO subscription is one of the surest ways to make money in China's stock markets.

Note in the chart below how frequently shares stop trading either for a halt or circuit breaker.

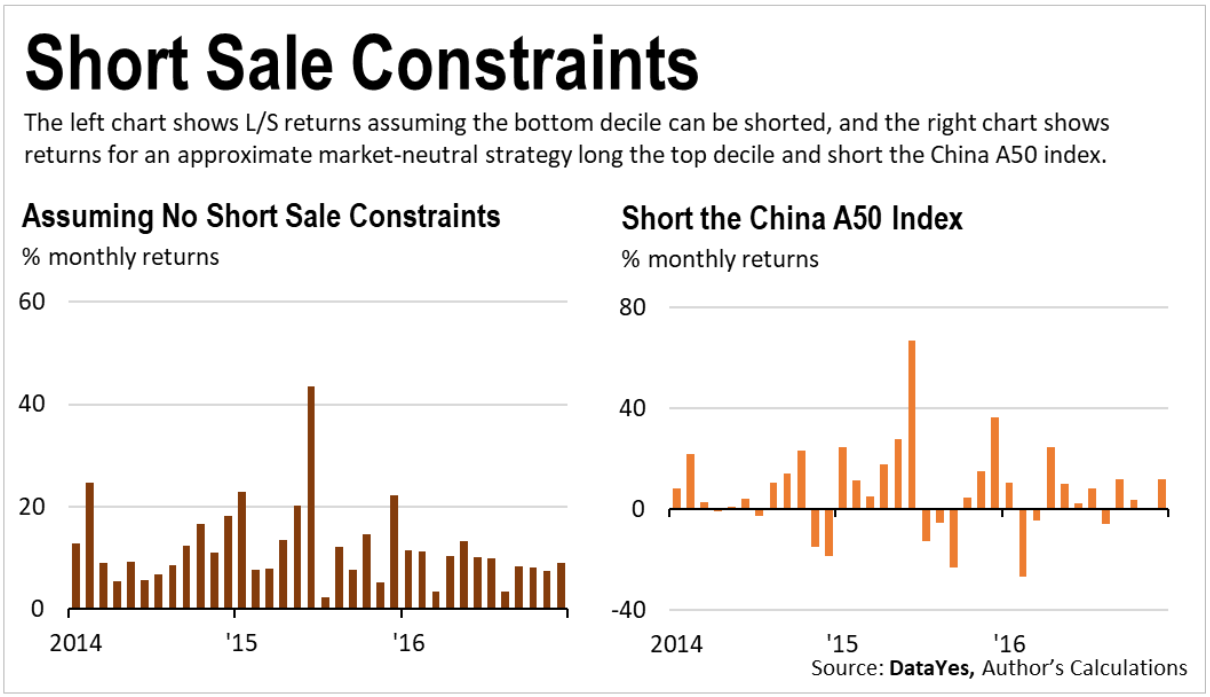



## Short Sale Constraints

Chinese shares are notoriously difficult to short. Although shorting stocks is legal for around 1000 securities, it can be very difficult to execute in practice. Only around 600 of those stocks will ever have outstanding short interest, and given the country's history of prosecuting 'malicious short sellers,' most quant investors shy away completely.

To approximate a market-neutral portfolio, we can go long on the top decile of any given factor, and go short the market using the Singapore-traded, China A50 Index. This makeshift solution has its limitations, however. First, shorting the market dilutes exposure to our intended factor. Second, the

China A50 poorly approximates the market. In practice, this method of 'China-proofing' hurts the promising momentum factor returns, and was particularly painful during the 2015 crash.




In sum, any trading strategy for China's equity markets must also consider its unique liquidity and short sale constraints.

# Conclusion

China's stock markets may seem enigmatic at first glance, but can be illuminated using the right tools. As we have shown using the DataYes Equity Factor dataset, there are patterns governing stock behavior in China as in any other equity market.

This study, the largest single-factor study of China's stock markets, should be followed with an examination of multi-factor model performance.

# Appendix

## Complete Decile Returns

Below is a complete list of the 400 factors examined in this study, ranked by L/S portfolio returns from highest to lowest. Be sure to review the bottom of the list, and note that several factors, generate impressive *negative* returns, which can of course be turned around.

| FACTOR CLASS | FACTOR NAME | L/S RETURNS |
|---|---|---|
| Overbought Oversold | REVS60 | 15.98 |
| Return | SharpeRatio60 | 15.64 |
| Return | TreynorRatio60 | 14.86 |
| Trend | DEA | 14.78 |
| Return | InformationRatio60 | 14.71 |
| Overbought Oversold | BIAS60 | 14.62 |
| Overbought Oversold | Price3M | 13.86 |

| | | |
|---|---|---|
| Return | GainVariance20 | 11.62 |
| Overbought Oversold | Price1Y | 11.59 |
| Return | SharpeRatio120 | 10.7 |
| Return | Alpha60 | 10.53 |
| Overbought Oversold | REVS120 | 10.15 |
| Return | InformationRatio120 | 10.02 |
| Trend | DIFF | 9.98 |
| Return | TreynorRatio120 | 9.72 |
| Overbought Oversold | CCI88 | 8.81 |
| Volume | TVSTD6 | 8.76 |
| Return | GainLossVarianceRatio20 | 7.98 |
| Overbought Oversold | FiftyTwoWeekHigh | 7.54 |
| Volume | STOQ | 7.46 |
| Power | AR | 7.45 |
| Volume | VOL120 | 7.14 |
| Overbought Oversold | MAWVAD | 7.12 |
| Return | Variance20 | 7.05 |
| Power | RSTR12 | 7.03 |
| Power | MassIndex | 6.82 |
| Return | Variance60 | 6.66 |
| Overbought Oversold | STM | 6.52 |
| Overbought Oversold | REVS250 | 6.35 |
| Power | BR | 5.97 |
| Return | Alpha120 | 5.62 |
| Valuation and Size | MktValue | 5.23 |
| Overbought Oversold | ATR14 | 4.9 |
| Overbought Oversold | ChandeSD | 4.67 |
| Power | RSTR24 | 4.63 |
| Volume | OBV20 | 4.6 |
| Volume | TVSTD20 | 4.59 |
| Overbought Oversold | WVAD | 4.54 |
| Overbought Oversold | ATR6 | 4.43 |
| Power | ARBR | 4.28 |
| Overbought Oversold | ADTM | 4.19 |
| Volume | DAVOL10 | 4.18 |
| Overbought Oversold | UpRVI | 4.01 |
| Overbought Oversold | DownRVI | 4.01 |
| Volume | STOA | 3.94 |
| Volume | TVMA20 | 3.69 |
| Volume | TVMA6 | 3.63 |
| Moving Average | APBMA | 3.61 |
| Volume | OBV6 | 3.04 |
| Trend | ADXR | 3 |

| | | |
|---|---|---|
| Overbought Oversold | REVS750 | 2.88 |
| Return | GainVariance60 | 2.81 |
| Overbought Oversold | SBM | 2.8 |
| Power | RC24 | 2.79 |
| Valuation and Size | NegMktValue | 2.79 |
| Return | Variance120 | 2.75 |
| Valuation and Size | PB | 2.65 |
| Return | GainLossVarianceRatio60 | 2.64 |
| Valuation and Size | PBIndu | 2.6 |
| Volume | DAVOL20 | 2.46 |
| Volume | VSTD10 | 2.3 |
| Volume | VOSC | 2.18 |
| Overbought Oversold | BollUp | 2.17 |
| Valuation and Size | PS | 2.12 |
| Volume | VEMA12 | 2.04 |
| Return | RealizedVolatility | 2.01 |
| Trend | Aroon | 2.01 |
| Volume | VOL10 | 1.97 |
| Moving Average | MA20 | 1.97 |
| Moving Average | BBI | 1.87 |
| Moving Average | EMA10 | 1.87 |
| Moving Average | MA10 | 1.87 |
| Moving Average | EMA12 | 1.86 |
| Moving Average | EMA5 | 1.86 |
| Moving Average | MA5 | 1.85 |
| Valuation and Size | PSIndu | 1.75 |
| Volume | VEMA10 | 1.72 |
| Moving Average | EMA20 | 1.66 |
| Overbought Oversold | BollDown | 1.64 |
| Volume | VDIFF | 1.61 |
| Moving Average | EMA26 | 1.52 |
| Return | LossVariance20 | 1.5 |
| Solvency | LongDebtToAsset | 1.47 |
| Overbought Oversold | DDNSR | 1.45 |
| Trend | DIF | 1.43 |
| Overbought Oversold | HSIGMA | 1.35 |
| Return | GainLossVarianceRatio120 | 1.32 |
| Valuation and Size | NIAP | 1.29 |
| Return | InformationRatio20 | 1.26 |
| Volume | VEMA26 | 1.19 |
| Valuation and Size | ForwardPE | 1.08 |
| Return | GainVariance120 | 0.98 |
| Return | LossVariance60 | 0.93 |

| | | |
|---|---|---|
| Volume | VROC6 | 0.92 |
| Overbought Oversold | REVS5m20 | 0.92 |
| Return | SharpeRatio20 | 0.91 |
| Valuation and Size | NLSIZE | 0.76 |
| Power | PVI | 0.76 |
| Profitability Quality | AdminiExpenseRate | 0.75 |
| Profitability Quality | PeriodCostsRate | 0.75 |
| Overbought Oversold | Skewness | 0.72 |
| Valuation and Size | PE | 0.71 |
| Growth | NPParentCompanyCutYOY | 0.71 |
| Volume | STOM | 0.71 |
| Derive | FCFF | 0.69 |
| Power | CR20 | 0.67 |
| Growth | NetProfitGrowRate | 0.65 |
| Growth | OperatingProfitGrowRate | 0.64 |
| Return | Alpha20 | 0.61 |
| Solvency | InteBearDebtToTotalCapital | 0.6 |
| Growth | TotalProfitGrowRate | 0.55 |
| Growth | NPParentCompanyGrowRate | 0.55 |
| Cash Flow | InvestCashGrowRate | 0.55 |
| Power | NVI | 0.53 |
| Return | Beta20 | 0.51 |
| Moving Average | EMA60 | 0.51 |
| Trend | UOS | 0.49 |
| Volume | VSTD20 | 0.49 |
| Per Share Indicators | DividendPaidRatio | 0.49 |
| Return | LossVariance120 | 0.46 |
| Trend | ADX | 0.46 |
| Solvency | CurrentRatio | 0.42 |
| Profitability Quality | OperatingExpenseRate | 0.42 |
| Per Share Indicators | EPS | 0.42 |
| Per Share Indicators | EnterpriseFCFPS | 0.42 |
| Return | DASTD | 0.4 |
| Return | CmraCNE5 | 0.4 |
| Solvency | NOCFToTLiability | 0.39 |
| Per Share Indicators | DilutedEPS | 0.39 |
| Profitability Quality | ROIC | 0.38 |
| Profitability Quality | InvestRAssociatesToTPLatest | 0.38 |
| Solvency | QuickRatio | 0.36 |
| Moving Average | ACD20 | 0.35 |
| Solvency | CurrentAssetsRatio | 0.33 |
| Growth | OperatingRevenueGrowRate | 0.33 |
| Solvency | EquityToAsset | 0.3 |

| | | |
|---|---|---|
| Cash Flow | OperCashGrowRate | 0.29 |
| Cash Flow | OperCashInToAsset | 0.28 |
| Solvency | TangibleAToNetDebt | 0.28 |
| Profitability Quality | InvestRAssociatesToTP | 0.27 |
| Cash Flow | ACCA | 0.27 |
| Operating Capacity | ARTDays | 0.26 |
| Profitability Quality | ROAEBITTTM | 0.26 |
| Per Share Indicators | OperatingProfitPSLatest | 0.25 |
| Valuation and Size | SGRO | 0.25 |
| Solvency | NOCFToInterestBearDebt | 0.25 |
| Trend | AD6 | 0.24 |
| Overbought Oversold | DVRAT | 0.24 |
| Profitability Quality | EGRO | 0.24 |
| Per Share Indicators | CapitalSurplusFundPS | 0.24 |
| Trend | AD | 0.23 |
| Trend | ASI | 0.23 |
| Trend | AD20 | 0.21 |
| Solvency | DebtTangibleEquityRatio | 0.21 |
| Operating Capacity | InventoryTDays | 0.2 |
| Profitability Quality | NetNonOIToTP | 0.19 |
| Solvency | TSEPToTotalCapital | 0.18 |
| Cash Flow | OperCashInToCurrentLiability | 0.16 |
| Power | BullPower | 0.16 |
| Volume | DAVOL5 | 0.16 |
| Operating Capacity | CashConversionCycle | 0.16 |
| Operating Capacity | OperatingCycle | 0.16 |
| Cash Flow | SaleServiceCashToOR | 0.15 |
| Cash Flow | NOCFToOperatingNILatest | 0.15 |
| Per Share Indicators | OperCashFlowPS | 0.14 |
| Valuation and Size | PCF | 0.12 |
| Cash Flow | NetProfitCashCover | 0.1 |
| Return | TreynorRatio20 | 0.09 |
| Cash Flow | CashToCurrentLiability | 0.09 |
| Operating Capacity | TotalAssetsTRate | 0.09 |
| Profitability Quality | NetNonOIToTPLatest | 0.08 |
| Overbought Oversold | RVI | 0.07 |
| Profitability Quality | ROEAvg | 0.07 |
| Operating Capacity | FixedAssetsTRate | 0.05 |
| Profitability Quality | OperatingNIToTP | 0.05 |
| Cash Flow | CashRateOfSalesLatest | 0.05 |
| Solvency | TangibleAToInteBearDebt | 0.04 |
| Derive | FCFE | 0.02 |
| Profitability Quality | ROECut | 0.02 |

| | | |
|---|---|---|
| Per Share Indicators | DividendPS | 0.02 |
| Valuation and Size | TEAP | 0.01 |
| Return | Beta252 | 0 |
| Valuation and Size | PEIndu | 0 |
| Cash Flow | CFO2EV | -0.01 |
| Profitability Quality | SalesCostRatio | -0.01 |
| Solvency | EquityFixedAssetRatio | -0.01 |
| Valuation and Size | PEG3Y | -0.01 |
| Profitability Quality | GrossIncomeRatio | -0.02 |
| Solvency | NOCFToNetDebt | -0.02 |
| Profitability Quality | ROE | -0.03 |
| Profitability Quality | ROA | -0.03 |
| Per Share Indicators | CashFlowPS | -0.04 |
| Operating Capacity | AccountsPayablesTDays | -0.04 |
| Cash Flow | SalesServiceCashToORLatest | -0.05 |
| Overbought Oversold | CMO | -0.05 |
| Overbought Oversold | CMRA | -0.06 |
| Derive | OperateNetIncome | -0.06 |
| Cash Flow | CashRateOfSales | -0.06 |
| Cash Flow | NOCFToOperatingNI | -0.06 |
| Per Share Indicators | SurplusReserveFundPS | -0.08 |
| Profitability Quality | ROECutWeighted | -0.09 |
| Solvency | FixAssetRatio | -0.09 |
| Per Share Indicators | CashDividendCover | -0.09 |
| Growth | DEGM | -0.1 |
| Operating Capacity | AccountsPayablesTRate | -0.1 |
| Operating Capacity | ARTRate | -0.11 |
| Cash Flow | CTP5 | -0.12 |
| Per Share Indicators | EPSTTM | -0.12 |
| Derive | NetOperateCFTTM | -0.13 |
| Per Share Indicators | ShareholderFCFPS | -0.14 |
| Profitability Quality | ROEDiluted | -0.15 |
| Moving Average | MA60 | -0.15 |
| Derive | NIAPCut | -0.16 |
| Profitability Quality | NPCutToNP | -0.17 |
| Operating Capacity | CurrentAssetsTRate | -0.17 |
| Profitability Quality | OperatingNIToTPLatest | -0.17 |
| Trend | ChaikinOscillator | -0.18 |
| Profitability Quality | NetProfitRatio | -0.19 |
| Profitability Quality | ROEWeighted | -0.19 |
| Operating Capacity | InventoryTRate | -0.2 |
| Profitability Quality | NPToTOR | -0.2 |
| Cash Flow | FinancingCashGrowRate | -0.21 |

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|---|---|---|
| Profitability Quality | TaxRatio | -0.21 |
| Growth | EARNMOM | -0.22 |
| Profitability Quality | ROAEBIT | -0.22 |
| Derive | NetDebt | -0.23 |
| Per Share Indicators | OperatingProfitPS | -0.24 |
| Return | HsigmaCNE5 | -0.24 |
| Growth | NetAssetGrowRate | -0.25 |
| Profitability Quality | FinancialExpenseRate | -0.25 |
| Per Share Indicators | OperatingRevenuePSLatest | -0.27 |
| Derive | EBIT | -0.27 |
| Derive | EBIAT | -0.27 |
| Growth | NetCashFlowGrowRate | -0.28 |
| Per Share Indicators | TORPSLatest | -0.3 |
| Solvency | DebtsAssetRatio | -0.3 |
| Per Share Indicators | TORPS | -0.31 |
| Operating Capacity | EquityTRate | -0.33 |
| Per Share Indicators | OperatingRevenuePS | -0.33 |
| Derive | ValueChgProfit | -0.33 |
| Solvency | NonCurrentAssetsRatio | -0.33 |
| Valuation and Size | PEG5Y | -0.34 |
| Per Share Indicators | CashEquivalentPS | -0.35 |
| Profitability Quality | EBITToTOR | -0.37 |
| Derive | NetWorkingCapital | -0.37 |
| Profitability Quality | TotalProfitCostRatio | -0.37 |
| Moving Average | EMA120 | -0.38 |
| Per Share Indicators | NetAssetPS | -0.38 |
| Derive | WorkingCapital | -0.39 |
| Derive | NRProfitLoss | -0.41 |
| Growth | TotalAssetGrowRate | -0.41 |
| Overbought Oversold | Volumn3M | -0.41 |
| Trend | EMV14 | -0.42 |
| Derive | NPFromOperatingTTM | -0.42 |
| Overbought Oversold | Volatility | -0.44 |
| Volume | OBV | -0.44 |
| Return | Beta60 | -0.45 |
| Growth | NetProfitGrowRate5Y | -0.45 |
| Per Share Indicators | RetainedEarningRatio | -0.47 |
| Solvency | InterestCover | -0.48 |
| Volume | KlingerOscillator | -0.49 |
| Volume | MoneyFlow20 | -0.49 |
| Profitability Quality | SUE | -0.5 |
| Derive | NetIntExpense | -0.51 |
| Per Share Indicators | DividendCover | -0.52 |

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|---|---|---|
| Profitability Quality | SUOI | -0.52 |
| Derive | FinanExpenseTTM | -0.54 |
| Power | TOBT | -0.54 |
| Profitability Quality | OperatingProfitRatio | -0.54 |
| Profitability Quality | OperatingProfitToTOR | -0.54 |
| Growth | NetProfitGrowRate3Y | -0.56 |
| Valuation and Size | LCAP | -0.56 |
| Valuation and Size | TotalAssets | -0.56 |
| Overbought Oversold | DDNBT | -0.57 |
| Derive | OperateProfitTTM | -0.58 |
| Derive | NPFromValueChgTTM | -0.63 |
| Derive | NonOperatingNPTTM | -0.65 |
| Per Share Indicators | UndividedProfitPS | -0.66 |
| Trend | EMV6 | -0.66 |
| Derive | NetProfitTTM | -0.66 |
| Derive | NetProfitAPTTM | -0.66 |
| Growth | OperatingRevenueGrowRate3Y | -0.67 |
| Per Share Indicators | RetainedEarningsPS | -0.67 |
| Derive | TProfitTTM | -0.69 |
| Trend | PVT | -0.69 |
| Solvency | DebtEquityRatio | -0.7 |
| Valuation and Size | LFLO | -0.7 |
| Overbought Oversold | ROC20 | -0.7 |
| Solvency | SuperQuickRatio | -0.73 |
| Derive | AssetImpairLossTTM | -0.75 |
| Moving Average | MA120 | -0.76 |
| Overbought Oversold | KDJ_J | -0.78 |
| Return | Beta120 | -0.78 |
| Profitability Quality | ROA5 | -0.84 |
| Profitability Quality | ETOP | -0.88 |
| Overbought Oversold | CCI20 | -0.89 |
| Moving Average | ACD6 | -0.91 |
| Profitability Quality | ETP5 | -0.91 |
| Overbought Oversold | CCI5 | -0.92 |
| Volume | VROC12 | -0.92 |
| Profitability Quality | ROE5 | -0.95 |
| Overbought Oversold | HBETA | -0.96 |
| Derive | SalesExpenseTTM | -0.98 |
| Growth | OperatingRevenueGrowRate5Y | -1.04 |
| Overbought Oversold | KDJ_K | -1.12 |
| Overbought Oversold | CCI10 | -1.2 |
| Derive | RetainedEarnings | -1.23 |
| Overbought Oversold | BackwardADJ | -1.25 |

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|---|---|---|
| Overbought Oversold | KDJ_D | -1.26 |
| Overbought Oversold | REVS5Indu1 | -1.26 |
| Derive | SaleServiceRenderCashTTM | -1.28 |
| Trend | MTMMA | -1.36 |
| Overbought Oversold | REVS20 | -1.37 |
| Overbought Oversold | Rank1M | -1.37 |
| Trend | DDI | -1.43 |
| Trend | DIZ | -1.43 |
| Overbought Oversold | MFI | -1.43 |
| Cash Flow | CTOP | -1.45 |
| Overbought Oversold | RSI | -1.45 |
| Overbought Oversold | REVS5 | -1.46 |
| Overbought Oversold | REVS20Indu1 | -1.46 |
| Trend | PVT6 | -1.47 |
| Derive | TotalFixedAssets | -1.49 |
| Derive | EBITDA | -1.5 |
| Return | Kurtosis120 | -1.51 |
| Trend | CoppockCurve | -1.54 |
| Derive | GrossProfitTTM | -1.56 |
| Derive | IntFreeCL | -1.58 |
| Trend | PVT12 | -1.59 |
| Overbought Oversold | BIAS5 | -1.63 |
| Derive | NetTangibleAssets | -1.64 |
| Trend | MTM | -1.65 |
| Overbought Oversold | DDNCR | -1.66 |
| Derive | DA | -1.68 |
| Overbought Oversold | ROC6 | -1.7 |
| Derive | CostTTM | -1.71 |
| Derive | AdminExpenseTTM | -1.71 |
| Derive | TRevenueTTM | -1.75 |
| Derive | RevenueTTM | -1.75 |
| Derive | TCostTTM | -1.77 |
| Solvency | LongTermDebtToAsset | -1.83 |
| Trend | AroonUp | -1.83 |
| Solvency | BLEV | -1.85 |
| Return | Kurtosis60 | -1.87 |
| Return | Kurtosis20 | -1.87 |
| Power | BearPower | -1.88 |
| Solvency | TSEPToInterestBearDebt | -1.98 |
| Valuation and Size | CETOP | -1.99 |
| Overbought Oversold | SRMI | -2.05 |
| Solvency | LongDebtToWorkingCapital | -2.08 |
| Valuation and Size | ASSI | -2.08 |

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|---|---|---|
| Overbought Oversold | BIAS10 | -2.16 |
| Derive | TotalPaidinCapital | -2.17 |
| Overbought Oversold | REVS10 | -2.21 |
| Power | RC12 | -2.29 |
| Volume | VDEA | -2.36 |
| Derive | IntDebt | -2.58 |
| Derive | IntCL | -2.62 |
| Volume | VR | -2.65 |
| Overbought Oversold | Price1M | -2.73 |
| Overbought Oversold | BIAS20 | -2.75 |
| Valuation and Size | TA2EV | -2.75 |
| Derive | IntFreeNCL | -2.79 |
| Overbought Oversold | ILLIQUIDITY | -3.02 |
| Trend | plusDI | -3.46 |
| Trend | ChaikinVolatility | -3.53 |
| Overbought Oversold | Volumn1M | -3.9 |
| Trend | minusDI | -4.27 |
| Trend | AroonDown | -4.99 |
| Volume | VEMA5 | -5.13 |
| Volume | VOL60 | -7.84 |
| Trend | MACD | -11.08 |
| Overbought Oversold | DBCD | -14.55 |
| Overbought Oversold | REVS5m60 | -16.93 |