TOP-20 Index Market Forecast, March 2017

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Overview

TOP-20 Index mimicking portfolios are the most efficient way to add Mongolian equities to an asset mix. We show what makes them interesting right now, analyse their latest performance and make a prediction for the near future.

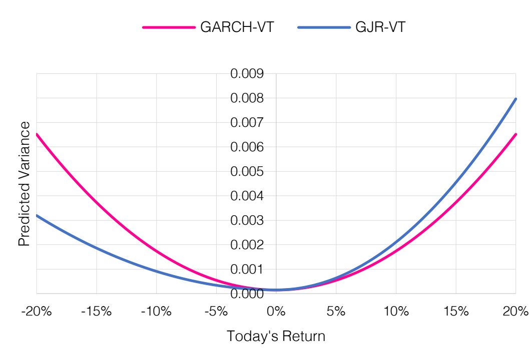
Why is TOP-20 a good investment?

In a recent report [1] we tested for, and verified, the presence of several interesting phenomena of TOP-20 Index, the most important of which are:

- *positive skewness*: an asymmetry in the distribution of returns that makes small losses, as well as large gains, more likely than, respectively, large losses and small gains;
- *negative leverage*: the fact that positive returns boost variance (a measure of the dispersion of actual returns around the predicted average value) more than negative returns with the same magnitude do.

These phenomena are beneficial for investors. Basically, negative leverage suggests that, if today's return is positive, tomorrow's return will be more variable – more difficult to predict, more risky. Also the larger the actual gain, the greater the uncertainty about tomorrow's outcome. So, if the stock market closed at an unusually high level today, we can expect it to either rise to a much higher, or to fall to a much lower, level tomorrow.

Figure 1: TOP-20 Index news impact curve



However, positive skewness tells us that the chance of a significant rise in the index price is greater than that of a significant fall. In other words, it is more likely to earn a lot, after a positive return, than it is to lose a lot, though, on average, it is more common to lose a little. We believe this asymmetry to be a symptom of **market euphoria**, the tendency of the public to react to positive news more than they do to negative news or, to put it another way, the fact that *investors are not as scared after negative events as they are excited after positive ones*. In particular, investors may be willing to accept a negative expected return throughout the period (as it has happened in the past five years, in which monthly average was –0.75%), in view of the greater chance to highly profit during market upturns.
A nice graphical representation of the positive skewness/negative leverage phenomena is given by the news impact curve (Figure 1). On the abscissae is the range of plausible current returns, on the ordinate their impact on tomorrow's variance. The pink para-

bola shows a symmetric response of variance to both negative and positive returns: in this case, only the magnitude of the actual return, and not its sign, matters. The blue parabola, instead, presents an asymmetric response: here, not only the size, but also the sign of the actual return matter for variance, and such is the behaviour of TOP-20 Index.

Actual investment performance

We analyse the performance of TOP-20 portfolios last month (January 27 – February 24). No trading activity took place between February 27 and March 1, due to the Tsagaan Sar festivity.

Price performance – Last month, TOP-20 Index level either stayed close to MNT 12,000 or rose, as we predicted in our previous report [2]. In particular, it fell below the threshold six out of 21 trading days (Figure 2), with an average, while below, of MNT 11,987.58. The average price throughout the period was MNT 12,127.60, and it was inflated by the rally occurred in the last trading days following the good news of an accord between IMF's staff and the Government of Mongolia «to support an economic and financial program by a three-year extended fund facility (EFF) for about $440 mln», as well as «to attract around $5.5 bln in total external financing to restore Mongolia's economic stability and debt sustainability, and to spur growth»[a] – a perfect example of market euphoria, as discussed above.

Investment performance – The realised one-month return on TOP-20 mimicking portfolios is 1.73%, and falls in the 65th percentile of the forecast distribution (Table 1, Figure 3). The frequency of losses was higher than that of gains and in line with expectations (60-40,

Figure 2: TOP-20 Index close price monthly performance

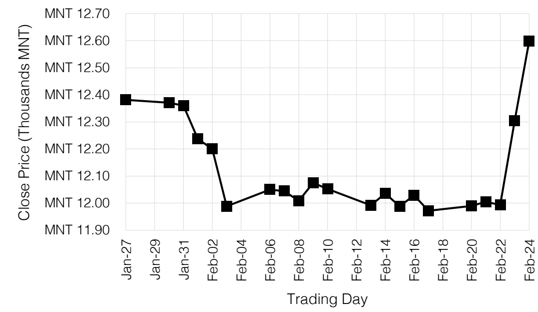
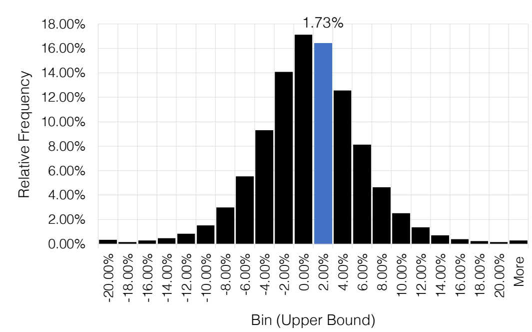


Table 1: Last month's investment performance	
Investment period	Jan. 27 – Feb. 24
No. of trading days	21
Actual one-month return	1.73%
Volatility	0.97%
Distribution percentile	65th
Frequency losses/gains	60%; 40%
Largest daily loss/gain	–1.75%; 2.55%
Average loss/gain	–0.44%; 0.87%
Dispersion of losses/gains	0.49%; 0.99%
Actual Sharpe ratio (perc.)	0.03 (64th)

Figure 3: Actual return ranking in the forecast distribution



we predicted 55-45). However, losses were smaller in size, as well as less dispersed (average: –0.44%; largest loss: –1.75%; volatility: 0.49%) than gains (average: 0.87%; largest gain: 2.55%; volatility 0.99%), a consequence of positive skewness/negative leverage. Overall volatility was lower than expected (0.97%). The actual Sharpe ratio, a measure of the investment return, in excess of the risk-free rate, per unit of risk, is 0.03 and falls in the 64th percentile.

*Value at Risk and Expected Shortfall** – The resources set apart to cover potential losses were adequate throughout the period. Losses never went past Value at Risk, 99% confidence level (Figure 3).

One-month ahead forecast

We now forecast next month's (March 6-April 3) performance of TOP-20 portfolios, blending results from filtered historical simulation and Monte Carlo [2]. We run 100,000 scenarios and dampen the current level of volatility – we reduce the amount of resources to set apart, given the period of market upturn (volatility multiplier: 0.6, predicted volatility level on March 6: 1.42%).

Price performance – The upsurge in volatility which followed the release of positive market news makes a one-month ahead forecast of TOP-20 Index price difficult. We believe the price will either stay close to MNT 12,000 or rise, although we point out this might be an overly conservative prediction, since the index almost reached MNT 13,000 in the first two trading days after the Tsagaan Sar hiatus (March 2-3). We expect the stock market rally to persist for a while.

Investment performance – We believe average monthly return to be slightly negative, around –0.5-0% (Table 2). However, the actual return will generally differ from this value due to the high volatility level (6.2%). Losses should be more frequent than gains (56-44), though usually smaller in magnitude (0.20-0.40% smaller). Approximately 30% of actual monthly returns will stay in the ±2% range, 55% in ±4%, and 72.5% in ±6% (Figure 4). The frequency of extreme returns, given the

Figure 3: Performance assessment of the risk model

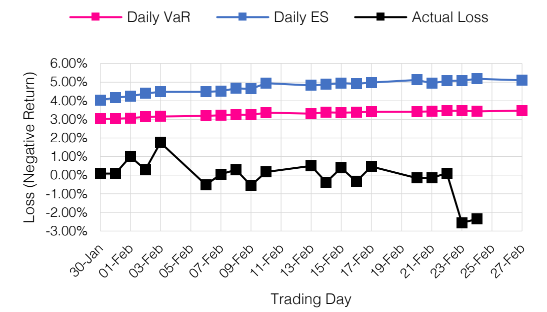


Table 2: Predicted investment statistics, %	
Average return	Between –0.5 and 0
Volatility (Risk)	6.2
Neg./pos. return freq.	56; 44
Average if neg./pos.	–4.50; 4.70
Freq. ret. beyond ±10	4.30; 4.50
Average beyond ±10	–13.30; 15.20

Figure 4: One-month ahead forecast of the distribution of returns

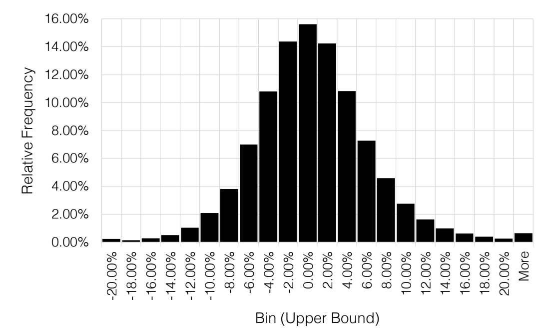


Table 3: Predicted one-month VaR and ES	
Value at Risk, 99%	14.35%
Expected Shortfall, 99%	18.50%
Portfolio Value, MNT	1,000,000
Value at Risk, MNT	134,000
Expected Shortfall, MNT	168,500

increased uncertainty on the market, should be close to 9%. Extreme gains should both be more common (4.5%) and larger in size, on average (15.20%), than extreme losses (frequency: 4.3%, average: –13.30%).

Value at Risk and Expected Shortfall – Predicted monthly Value at Risk, 99% c.l., is about 14.35%, or MNT 134,000 per million invested in the portfolio (~EUR 51.00) (Table 3). Daily VaR should be between 3.50% and 3.70% (Figure 5). Predicted monthly Expected Shortfall, 99% c.l., is around 18.50%, or MNT 168,500 per million (~EUR 64.00). Daily ES should be between 4.80% and 5.25%.

*Sharpe ratio** – As a proxy for the risk-free rate we use the most recent (March 3) annualised government bill rate (Table 4). The average Sharpe ratio is –0.30, although the actual ratio will generally vary due to the significant volatility on the market. Ratios should be positive one-third of the times, with an average, if positive, of 0.70 (0.10 smaller, in absolute value, than that if negative). Extreme positive ratios should be ~1% less frequent than extreme negative ones, although ~0.50 higher, due to positive skewness and negative leverage (Figure 6).

Conclusion

The recent good economic news, combined with the presence of positive skewness and negative leverage, make TOP-20 portfolios an interesting investment opportunity at the moment. Positive skewness is an asymmetry in the distribution of returns which implies a frequency of small losses and large gains higher than that of, respectively, large losses and small gains. Negative leverage tells us that, after the release of good market news, gains are more likely followed by even larger gains or, at most, by small losses. Both phenomena are symptoms of market euphoria and, especially during periods of market upturn, such as this one, help boost the overall portfolio return.

Figure 5: One-month ahead forecast of the term structure of VaR-ES

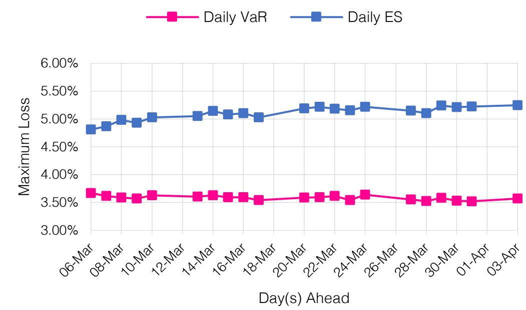
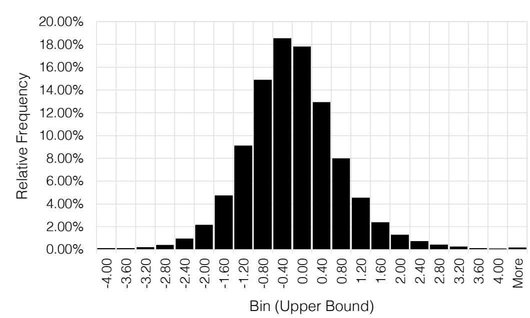


Table 4: Risk-free rate, %	
Annualised risk-free rate, 3m	16.911
Risk-free rate, 1m	1.41

Table 5: Predicted Sharpe ratio statistics	
Average ratio	–0.30
Neg./pos. ratio frequency	66%; 34%
Average if neg./pos.	–0.80; 0.70
Freq. of ratios beyond ±2	3.2%; 2.0%
Average if beyond ±2	–2.55; 3.00

Figure 6: One-month ahead forecast of the distribution of Sharpe ratios



The report is made for Standard Investment LLC by Federico M. Massari, a long distant volunteer risk analyst, using the sources provided.

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* Value at Risk (VaR): the potential loss that would only be exceeded 1% of the times during the investment period.

* Expected Shortfall (ES): the average loss, given that the actual return is worse than the VaR.
* Sharpe ratio: a measure of the return of an investment in excess of the risk-free rate, per unit of risk. On the numerator is the difference between the actual (or predicted) return of the investment and the risk-free rate of equivalent maturity (e.g. one month). On the denominator is the volatility of the returns.

[a] http://www.imf.org/en/News/Articles/2017/02/19/PR1754-Mongolia-IMF-Reaches-Staff-Level-Agreement-on-3Yr-EFF

Bibliography

[1] Massari, F.M.: *Mongolia's TOP-20 Index Risk Analysis, Pt. 2*, 2017, Standard Investment LLC.
Available at *standardinvestment.mn/en*

[2] Massari, F.M.: *Should You Add TOP-20 To Your Asset Mix?*, 2017, Standard Investment LLC. Full report and Investors' Edition available at *standardinvestment.mn/en*

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