Repayment of margin debt could cause a big sell-off

- Margin debt is a sentiment factor explaining 33% of the average daily return for A shares, when other top-down factors fail
- A-share market leverage and borrowing cost is 4x higher than the US market — not sustainable and susceptible to a pullback
- We recommend: short stocks with highest margin finance

Most factors fail to explain the circa-50% YTD increase in the MSCI China Index, likely because factors not covered by our model are driving the market. Policies like the Shanghai-Hong Kong Stock Connect are difficult, if not impossible, to capture in a conventional model.

Top-down factors also a worry
Top-down factors, such as the PMI, M2 and electricity consumption, aren't working the way they used to. (Note: the negative coefficients of these macro factors show the A-share rally is not being driven by fundamental factors.)

However, our regression analysis indicates that 2 factors relating to China margin debt (new borrowing as a percentage of ADT, and margin debt as a % of market free float) are statistically significant. Our analysis using daily data since 31 October 2014 shows that the 1st factor explains 33% of the A-share market’s daily return, with a coefficient of 1.21 – a 1% rise in this ratio would imply a 1.21% rally in the market, and vice versa. A regression analysis of the CSI 300 Index and the 2nd factor above shows an R² of 98%, indicating the market is being driven by borrowed money.

So what does this mean?
A look at the NYSE, which introduced margin debt in the 1950s, is instructive. Using data since 1993 for a regression analysis of the S&P500, we found that net margin debt accounts for 13% of the market’s monthly performance. We also found: 1) the net margin debt balance tends to rise steadily in a bull market, and 2) when the market turns south, investors pay back debt much faster, coinciding with or even preceding a crash. The fat-tail risk of such a speedy repayment could drag the market into a downward spiral.

So what are the chances of this happening in China? Quantifying the leverage is straightforward: investors in China have borrowings of CNY2.3tn, equal to 8.3% of the A-share market, per Wind data (vs. 2.1% for the NYSE as of April). But if we consider other financing channels in China, the actual leverage is much higher. To quantify the fragility of sentiment, we take the difference between financing costs and realised market returns. Investors in China shares borrow from local brokers at 8.5% (vs. 2% in the US) in hope of making a quick 20-30% return. When the market moves against them, they are prone to repay the debt. The recent 13.5% pullback in A shares is testing investors’ limit every day. The spike in market volatility indicates the market is on the cusp of a peak. How to manage margin debt and avoid the consequences of deleveraging is a priority for regulators, which increases the difficulty of predicting the market. But we think there is a risk the situation could snowball further, barring concerted government action.

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We recommend taking profits in highly levered stocks

We maintain margin finance balance data for all Shanghai-Hong Kong Stock Connect stocks. Please contact us (jibo.ma@hk.dawaicm.com) for further details.

### Top-25 Stock Connect stocks with highest margin debt balance as % of free float and a PER higher than 20x

<table>
<thead>
<tr>
<th>Name</th>
<th>Industry</th>
<th>Balance</th>
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<tr>
<td>601989 CH</td>
<td>CHINA SHIPBUILDING INDUSTRIE</td>
<td>17.430</td>
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<td>601688 CH</td>
<td>HUATAI SECURITIES CO LTD</td>
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<td>600705 CH</td>
<td>AVCI CAPITAL CO LTD</td>
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<td>600050 CH</td>
<td>CHINA UNITED NETWORK</td>
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<td>601766 CH</td>
<td>CIRIC CORP LTD</td>
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<td>GU POWER DEVELOPMENT CO</td>
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<td>601019 CH</td>
<td>SINOLINK SECURITIES CO LTD</td>
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<td>INNER MONGOLIAN BAOTOU</td>
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<td>CHINA LIFE INSURANCE CO</td>
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<td>LIAONING CHENG DA CO LTD</td>
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<td>600804 CH</td>
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<td>600588 CH</td>
<td>YONYOU NETWORK</td>
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Source: Daiwa Custom Products Group

### Top-25 Stock Connect stocks with the highest margin debt balance as % of daily turnover and a PER higher than 20x

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<th>Industry</th>
<th>As % FF</th>
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<td>600662 CH</td>
<td>CHINA RESOURCES DOUBLE ERA</td>
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<td>ZHEJIAO YANKON GROUP CO LTD</td>
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<td>XIAN SHANGU POWER CO LTD</td>
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<td>EVERBRIGHT SECURITIE CO</td>
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<td>600594 CH</td>
<td>GUZHOU YIBAI PHARMACEUTIC</td>
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<tr>
<td>600369 CH</td>
<td>SOUTHWEST SECURITIES CO LT</td>
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<td>CHINA OILFIELD SERVICES</td>
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<td>600348 CH</td>
<td>YANGQUAN COAL INDUSTRY GRP</td>
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<td>600888 CH</td>
<td>YONYOU NETWORK</td>
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<td>XUAN WANG SHANCOO CO LTD</td>
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<td>JILIN YATAI GROUP CO LTD</td>
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<td>HUATAI SECURITIES CO LTD</td>
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<td>600458 CH</td>
<td>ZHUZHOU TIMES NEW MATERIAL</td>
<td>22.5</td>
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</tbody>
</table>

Source: Daiwa Custom Products Group
Appendix 1: Historical factor premium - MSCI China A

The factor premium is calculated based on the difference in daily return between the top quintile and bottom quintile stock baskets ranked by each factor (zero investment method). A positive return means a certain factor is outperforming and vice-versa. The cumulative return of the daily return effectively shows us the factor performance over time.

- **Summary:** only size, sentiment and growth factors have a positive premium

- **Value:** weakening after recovering in March

- **Growth:** recovering

- **Earnings yield:** negative factor premium

To smooth the chart, we use the 9-Day Exponential Moving Average (9D EMV) and 50-Day Simple Moving Average (50D SMV). In general, an upward trend means a certain style is working, and a crossover of the 9D EMV and 50D SMV lines means the turn of the trend. The absolute difference between the 9D EMV and 50D SMV line indicates the strength of the factor trend. A larger absolute difference means a strong trend and vice-versa. A detailed factor definition can be found in Appendix 2: Methodology and Factor Definition.
- Dividend yield: negative factor premium

- Volatility: low volatility stocks outperforming

- Size: we prefer small caps

- Trading: no factor premium

- Momentum: surprisingly, high earnings and price momentum are not outperforming

- Leverage: high-leverage stocks are starting to gain popularity

Source: Daiwa Custom Products Group
Appendix 2: methodology and factor definition

We mention 2 models in this report: 1) a historical factor premium model, which we calculate based on the returns of a hedged-portfolio methodology, and 2) a factor rotation model, based on an information coefficient. While we use both models to calculate factor premiums, they serve different purposes: the first is used to identify factors that are working and the second to select stocks with the largest exposure to the more positive factors in our model.

In theory, both models should show similar patterns in terms of the performance of each factor. But in reality there are some differences, based on factor definition and the data used in our models. For example: 1) there are 34 factors in the first model and 100 factors in the second, and 2) the first model is rebalanced daily, while the second one is rebalanced weekly. The simple average is used for both models.

Note: the performance results of these models do not reflect Daiwa’s actual trading but are back-testing results only.

1. Factor Definitions (Historical Factor Premium Model)

Value: Book-to-Price 12M, FCF Yield, Sales-to-Price FY0 ROE 12M, ROE 12M Change, Accrual to Assets

Growth: 3Yr EPS Growth, EPS FY2 Growth, EPS FY2 Growth Change, Dividend Payout Ratio, Total Assets Change

Size: Market Size

Volatility: 1-Year Volatility, 3M Volatility, Monthly Trading Range, EPS Variability

Dividend Yield: Dividend Yield FY0, Dividend Yield 12M

Earnings Yield: Earnings Yield FY0, Earnings Yield 12M

Trading: Turnover, Price Impact, Relative Volume

Momentum: 12Mth-1Mth Change, 200D Moving Change, 20D Moving Change, 3M EPS Revision

Sentiment: Up-Down Signal, Target Price Implied Return, Earnings Surprise

2. Factor Definition (Factor Rotation Model)

Valuation

Dividend Yield FY0: last reported dividend divided by most recent week-end price

Dividend Yield 12M: next 12M forward dividend divided by most recent week-end price

Earnings Yield FY0: last reported EPS divided by most recent week-end price

Earnings Yield 12M: next 12M forward EPS divided by most recent week-end price

Book-to-Price FY0: last reported book value per share divided by most recent week-end price

Book-to-Price 12M: next 12M forward book value per share divided by most recent week-end price

Capital Employed to EV: latest capital employed divided by enterprise value (market cap + total debt + preferred stocks + minority interest – cash & cash equivalent)

3-Year Cyclical Earnings Yield: average 3-year reported earnings yield

7-Year Cyclical Earnings Yield: average 7-year reported earnings yield

10-Year Cyclical Earnings Yield: average 10-year reported earnings yield

PEG Historical: last reported PER divided by 3-year reported earnings growth rate

PEG Forward: next 12M forward PER divided by 3-year forward earnings growth rate

OCF Yield: trailing 12M operating cash flow divided by market value

FCF Yield: Last reported free cash flow divided by market value

Sales-to-Price FY0: reported sales divided by market value

Sales-to-Price 12M: next 12M forward sales divided by market value

EBITDA/EV FY0: reported EBITDA divided by enterprise value

EBITDA/EV 12M: next 12M forward EBITDA divided by enterprise value

Sales/EV FY0: reported sales divided by enterprise value

Sales/EV 12M: next 12M forward sales divided by enterprise value

Market Size: latest log market value

Risk

Cash Ratio: reported cash divided by current liabilities

Current Ratio: reported current assets divided by current liabilities

Quick Ratio: reported cash, marketable securities and accounts receivable divided by current liabilities
**Debt-to-Equity**: reported total debt divided by total common equity

**Debt-to-Equity Relative**: reported debt-to-equity ratio minus industry median

**Operating Leverage Ratio**: annual percentage change on reported operating income divided by annual percentage change on reported sales

**Interest Coverage**: reported EBIT divided by interest expenses

**Interest Coverage Relative**: reported interest coverage ratio minus industry median

**Cash flow Coverage**: reported operating cash flow divided by total debt

**Cash flow Coverage Relative**: reported cash flow coverage minus industry median

**1-Year Volatility**: 1-year daily price change standard deviation

**3M Volatility**: 3M daily price change standard deviation

**Monthly Trading Range**: 1M high-low closing price range divided by latest closing price

**EPS Variability**: average 10-year historical trend line, removing residual EPS divided by average reported EPS

**Sales Variability**: average 10-year historical trend line removing residual sales divided by average reported sales

**EPS Dispersion**: Standard deviation of FY2 EPS estimate divided by median estimate

**Turnover**: average 30-day daily volume divided by average shares outstanding

**Price Impact**: average 30-day daily absolute price returns to daily turnover percentage as a ratio

**Relative Volume**: average 1-week volume divided by average 3-month volume

**Operating Efficiency**

**Assets Turnover**: reported sales divided by total assets

**Assets Turnover Relative**: reported assets turnover ratio minus industry median

**Inventory Turnover**: reported COGS divided by average inventory

**Inventory Turnover Relative**: reported inventory turnover ratio minus industry median

**Operating Profit**

**Gross Margin**: reported gross income divided by sales

**Operating Margin**: reported operating income divided by sales

**Net Margin**: reported net income divided by sales

**OCF Margin**: reported operating cash flow divided by sales

**FCF Margin**: reported free cash flow divided by sales

**ROE FY0**: reported net income divided by average equity

**ROE 12M**: next 12M forward returns on equity, based on brokers’ estimates

**ROA FY0**: reported net income divided by average assets

**ROA 12M**: next 12M forward return on assets, based on broker estimates

**ROIC FY0**: reported net income divided by average invested capital (long-term debt + total shareholders’ equity)

**ROIC12M**: next 12M forward net operating profit after tax divided by invested capital

**Growth and Fundamental Momentum**

**3-year EPS Growth**: average EPS year-on-year growth rate for the last 3 reported years

**5-year Earnings Growth**: annualised 5-year historical EPS growth rate

**EPS FY2 Growth**: annualised 2-year forward EPS growth rate

**EPS FY2 Growth Change**: EPS FY2 growth rate minus the same rate 1 year ago

**3M EPS Revision**: percentage change in EPS FY2 estimate and the same year estimate 3 months ago

**EPS FY2 Growth**: annualised 2-year forward sales growth rate

**Sales FY2 Growth Change**: sales FY2 growth rate minus the same rate 1 year ago

**Long Term Growth Rate**: EPS long-term growth rate, based on broker estimates

**Dividend Yield Growth**: percentage change in the next 12M forward dividend yield and reported dividend yield

**Dividend Payout Ratio**: reported dividend per share divided by earnings per share

**Gross Margin Change**: reported gross income to sales ratio minus the same ratio for the previous fiscal year

**Operating Margin Change**: reported operating income to sales ratio minus the same ratio for the previous fiscal year
Net Margin Change: reported net income to sales ratio minus the same ratio for the previous fiscal year

CPM Change: reported operating cash flow to sales ratio minus the same ratio for the previous fiscal year

FCF Margin Change: reported free cash flow to sales ratio minus the same ratio for the previous fiscal year

ROE 12M Change: next 12M forward return on equity minus the same ratio for the previous fiscal year

ROA 12M Change: next 12M forward return on assets minus the same ratio for the previous fiscal year

ROIC 12M Change: next 12M forward operating profit after tax to invested capital ratio minus the same ratio for the previous fiscal year

Cash Ratio Change: reported cash to current liabilities ratio minus the same ratio for the previous fiscal year

Current Ratio Change: reported current assets to current liabilities ratio minus the same ratio for the previous fiscal year

Quick Ratio Change: the sum of reported cash, marketable securities and accounts receivable to current liabilities ratio minus the same ratio for the previous fiscal year

Debt-to-Equity Change: reported total debt to common equity ratio minus the same ratio for the previous fiscal year

Interest Coverage Change: reported EBIT to interest expenses ratio minus the same ratio for the previous fiscal year

Cash flow Coverage Change: reported operating cash flow to total debt ratio minus the same ratio for the previous fiscal year

Assets Turnover Change: reported sales to total assets ratio minus the same ratio for the previous fiscal year

Inventory Turnover Change: reported COGS to average inventory ratio minus the same ratio for the previous fiscal year

Forecast Error: difference between realised EPS and that of EPS forecast 1 year ago divided by current closing price

Accrual Percent: reported accrual (net income – operating cash flow) divided by absolute value of net income

Deferred Tax: reported deferred tax income divided by total assets

Capital Expenditure Ratio: reported capital expenditure, with depreciation & amortisation deducted, divided by sales

Investment to Assets: difference between annual change in PP&E and annual change in inventory divided by total assets in the previous fiscal year

Total Assets Change: percentage change of reported total assets and that of the previous fiscal year

R&D to EV: reported R&D expenses divided by enterprise value (market cap + total debt + preferred stocks + minority interest – cash & cash equivalents)

Extraordinary to Book: reported extraordinaries & discontinued operating items divided by total common equity

Sentiment

Up-Down Signal: difference between the number of brokers’ upward-forecast revisions and downward revisions in terms of FY1 EPS divided by total revisions for the past 3 months

Target Price Implied Return: percentage of I/B/E/S consensus target price and current closing price

Earnings Surprise: percentage change of reported EPS and consensus estimate as at reporting date

Earnings Surprise Standardised: standard deviation in terms of the difference between reported EPS and brokers’ estimates as at the reporting date

Technical Indicators

200D Moving Average Change: percentage change in the 200-day moving average and that of 1 month ago

20D Moving Average Change: percentage change in the 20-day moving average and that of 1 month ago

12Mth-1Mth Change: 12-month daily moving average minus 1-month daily moving average

Volatility Z score Ratio: 10-day volatility z-score divided by 90-day volatility z-score (z-score: difference between 90-day volatility and the rolling average of the 90-day volatility divided by a rolling 90-day standard deviation of 90-day volatility)

SQE: 20-day Keltner bandwidth divided by 20-day Bollinger bandwidth

Quality

Working Capital to Sales: reported working capital (inventory + accounts receivable – accounts payable) divided by sales

Accrual to Assets: reported accrual (net income – operating cash flow) divided by average assets
Notes
Investors should consider this document as only a single factor in making their investment decision, and the report should not be viewed as identifying or suggesting all risks, direct or indirect, that may be associated with any investment decision.

The recommendations, opinions and trading calls contained in this commentary are those of Daiwa’s Customs Products Group, and may differ from the fundamental recommendations of Daiwa’s equity-research analysts.
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<table>
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<tr>
<th>Office / Branch / Affiliate</th>
<th>Address</th>
<th>Tel</th>
<th>Fax</th>
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<tbody>
<tr>
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<td>61.0%</td>
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<tr>
<td>Hold***</td>
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<td>Sell***</td>
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