

Zijin Mining (2899.HK)

Earnings Review: 1H18 above expectation on solid operation: Attractive valuation post correction; upgrade to Buy

BUY

2899.HK	12m Price Target: HK\$3.90	Price: HK\$2.70	Upside: 44.4%
601899.SS	12m Price Target: Rmb4.90	Price: Rmb3.31	Upside: 48.0%

Zijin reported 1H18A NP of Rmb2.526bn and EPS of Rmb0.110/sh, up 68% and 59% YoY respectively. Excluding one-offs, including impairment and FX loss, recurring NP was Rmb2.577bn up 55% YoY, higher than our estimates and Bloomberg consensus mainly due to higher zinc concentrate output, higher gold price and lower finance cost.

Mined gold production was 16.9t, down 10% yoy due to declining grade from Zijinshan and earthquake in Porgera. Mined copper volume was 119kt, up 30% yoy, due to Kolwezi contribution (19% of total copper production in 1H18A). Zinc output was higher than expectation by delivering 54% of 2018 full year guidance. Unit COGS for gold/copper were up both 6% yoy likely due to lower grade in gold and new copper mine operation, both slightly higher than expectation. Operating cash flow was strong at Rmb5.0bn, up 51% yoy due to lower A/R and inventory days. Net gearing declined to 82% versus 89% of 6 months ago.

By 1H18, we estimate Zijin has produced 46-49% of gold and copper of full year production guidance. We expect gold output to remain flat yoy and copper output to grow by 18% yoy in 2018E with 6 months more contribution from Kolwezi. With expansion of Duobaoshan, Zijinshan, and ramp up of Kolwezi, we expect copper output to grow by 17-19% per year for 2019E-2020E, assuming no major acquisitions.

We revise up gold price to US\$1,340/oz (from US\$1,251/oz) in 2018E, US\$1,450/oz (from US\$1,219/oz) in 2019E, and US\$1,525/oz (from US\$1,257/oz) in 2020E based on our global commodity team's current gold price forecast. According to the team's [Commodity Watch-Commodities](#) at 'bull' tilt report, they maintain their long-term

Joy Zhang

+852-2978-6545 | joy.x.zhang@gs.com
Goldman Sachs (Asia) L.L.C.

Trina Chen

+852-2978-2678 | trina.chen@gs.com
Goldman Sachs (Asia) L.L.C.

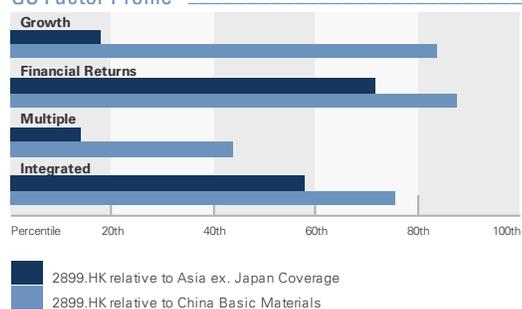
Key Data

Market cap: HK\$62.2bn / \$7.9bn
Enterprise value: HK\$78.9bn / \$10.1bn
3m ADTV: HK\$95.4mn / \$12.2mn
China
China Basic Materials
M&A Rank: 3

GS Forecast

	12/17	12/18E	12/19E	12/20E
Revenue (Rmb mn) New	94,548.6	102,242.9	111,590.8	114,886.9
Revenue (Rmb mn) Old	94,548.6	93,013.2	93,530.6	95,013.5
EBITDA (Rmb mn)	11,125.6	12,666.7	14,779.5	15,339.8
EPS (Rmb) New	0.16	0.20	0.24	0.26
EPS (Rmb) Old	0.16	0.17	0.18	0.19
P/E (X)	15.3	12.1	9.9	9.2
P/B (X)	1.6	1.5	1.3	1.2
Dividend yield (%)	3.8	4.1	5.0	5.4
CROCI (%)	34.9	23.7	25.9	26.4
	12/17	6/18	12/18E	--
EPS (Rmb)	0.09	0.11	0.09	--

GS Factor Profile



Source: Company data, Goldman Sachs Research estimates. See disclosures for details.

Goldman Sachs does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision. For Reg AC certification and other important disclosures, see the Disclosure Appendix, or go to www.gs.com/research/hedge.html. Analysts employed by non-US affiliates are not registered/qualified as research analysts with FINRA in the U.S.

Buy

Zijin Mining (2899.HK)

Rating since Aug 27, 2018

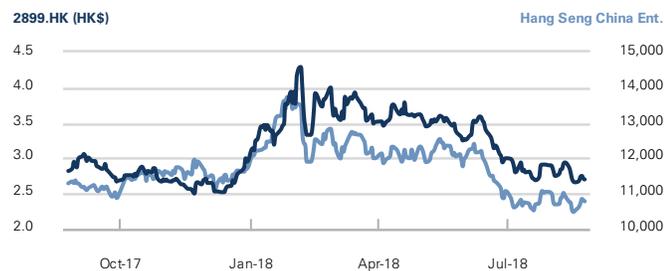
Ratios & Valuation

	12/17	12/18E	12/19E	12/20E
P/E (X)	15.3	12.1	9.9	9.2
P/B (X)	1.6	1.5	1.3	1.2
FCF yield (%)	8.4	10.1	11.1	12.0
EV/EBITDA (X)	6.1	5.5	4.5	5.1
CROCI (%)	34.9	23.7	25.9	26.4
ROE (%)	11.2	12.4	14.1	14.0
Net debt/equity (%)	27.9	25.9	14.0	30.5
Interest cover (X)	3.0	4.3	5.6	6.5
Days inventory outst, sales	44.6	41.1	40.7	41.6
Receivable days	8.6	10.4	10.4	10.7
Days payable outstanding	21.0	21.0	23.2	23.9
DuPont ROE (%)	9.3	10.9	11.8	11.3
Turnover (X)	1.1	1.1	1.2	1.2
Leverage (X)	2.4	2.2	2.0	1.8

Growth & Margins (%)

	12/17	12/18E	12/19E	12/20E
Total revenue growth	19.9	8.1	9.1	3.0
EBITDA growth	66.4	13.9	16.7	3.8
EPS growth	83.1	25.1	22.1	7.5
DPS growth	40.3	8.6	22.1	7.5
EBIT margin	7.5	8.7	9.8	10.0
EBITDA margin	11.8	12.4	13.2	13.4
Net income margin	3.7	4.4	4.9	5.1

Price Performance



	3m	6m	12m
Absolute	(22.6)%	(30.4)%	(4.9)%
Rel. to the Hang Seng China Ent.	(12.8)%	(17.8)%	(2.5)%

Source: FactSet. Price as of 24 Aug 2018 close.

Income Statement (Rmb mn)

	12/17	12/18E	12/19E	12/20E
Total revenue	94,548.6	102,242.9	111,590.8	114,886.9
Cost of goods sold	(81,515.8)	(88,827.3)	(96,029.4)	(98,747.6)
SG&A	(3,743.0)	(3,917.6)	(4,029.2)	(4,116.7)
R&D	-	-	-	-
Other operating inc./exp.)	(2,220.9)	(560.8)	(560.8)	(560.8)
EBITDA	11,125.6	12,666.7	14,779.5	15,339.8
Depreciation & amortization	(4,056.7)	(3,729.6)	(3,808.1)	(3,878.1)
EBIT	7,068.9	8,937.2	10,971.3	11,461.7
Net interest inc./exp.)	(2,013.0)	(1,766.7)	(1,585.8)	(1,372.6)
Income/(loss) from associates	(29.3)	(29.8)	(30.4)	(31.1)
Pre-tax profit	4,568.0	7,144.1	9,355.1	10,058.1
Provision for taxes	(1,320.4)	(1,345.5)	(1,761.9)	(1,894.3)
Minority interest	260.2	(1,295.1)	(2,093.9)	(2,251.2)
Preferred dividends	-	-	-	-
Net inc. (pre-exceptionals)	3,507.7	4,503.4	5,499.2	5,912.5
Post-tax exceptionals	-	-	-	-
Net inc. (post-exceptionals)	3,507.7	4,503.4	5,499.2	5,912.5
EPS (basic, pre-exception) (Rmb)	0.16	0.20	0.24	0.26
EPS (diluted, pre-exception) (Rmb)	0.16	0.20	0.24	0.26
EPS (basic, post-exception) (Rmb)	0.16	0.20	0.24	0.26
EPS (diluted, post-exception) (Rmb)	0.16	0.20	0.24	0.26
DPS (Rmb)	0.09	0.10	0.12	0.13
Div. payout ratio (%)	57.6	50.0	50.0	50.0

Balance Sheet (Rmb mn)

	12/17	12/18E	12/19E	12/20E
Cash & cash equivalents	5,936.1	6,419.1	7,006.0	7,213.0
Accounts receivable	2,812.2	3,041.1	3,319.1	3,417.2
Inventory	11,089.8	11,961.1	12,896.4	13,260.5
Other current assets	8,836.9	8,433.3	8,519.3	8,549.6
Total current assets	28,675.0	29,854.6	31,740.9	32,440.2
Net PP&E	33,432.8	34,643.2	35,740.4	36,734.9
Net intangibles	10,367.1	9,767.1	9,201.8	8,669.2
Total investments	0.0	0.0	0.0	0.0
Other long-term assets	16,840.4	16,840.4	16,809.9	16,778.9
Total assets	89,315.3	91,105.3	93,493.0	94,623.2
Accounts payable	4,396.3	5,830.2	6,363.2	6,551.2
Short-term debt	9,855.9	12,363.5	10,924.6	9,232.4
Other current liabilities	(74,773.8)	(80,613.7)	(82,890.1)	(84,261.1)
Total current liabilities	28,793.6	28,685.3	27,890.7	26,145.7
Long-term debt	6,599.0	4,771.7	2,612.6	13,852.7
Other long-term liabilities	16,279.8	16,279.8	16,279.8	2,500.7
Total long-term liabilities	22,878.8	21,051.5	18,892.3	16,353.4
Total liabilities	51,672.4	49,736.7	46,783.0	42,499.1
Preferred shares	-	-	-	-
Total common equity	34,999.7	37,430.4	40,677.9	43,840.7
Minority interest	2,643.1	3,938.2	6,032.1	8,283.4
Total liabilities & equity	89,315.3	91,105.3	93,493.0	94,623.2
Gross cash invested (ex cash)	44,164.9	48,394.5	49,468.1	50,372.5
Net debt, adjusted	10,518.9	10,716.1	6,531.1	15,872.2
Average capital employed	46,190.6	50,123.2	52,662.9	60,618.7
BVPS (Rmb)	1.52	1.63	1.77	1.90

Cash Flow (Rmb mn)

	12/17	12/18E	12/19E	12/20E
Net income	3,507.7	4,503.4	5,499.2	5,912.5
D&A add-back	4,056.7	3,729.6	3,808.1	3,878.1
Minority interest add-back	(260.2)	1,295.1	2,093.9	2,251.2
Net (inc)/dec working capital	(3,788.3)	699.0	(317.1)	(147.9)
Other operating cash flow	6,248.4	(0.0)	0.0	-
Cash flow from operations	9,764.4	10,227.1	11,084.2	11,893.9
Capital expenditures	(5,037.5)	(4,340.0)	(4,340.0)	(4,340.0)
Acquisitions	0.0	-	-	-
Divestitures	-	-	-	-
Others	1,111.7	0.0	30.4	31.1
Cash flow from investing	(5,947.6)	(4,340.0)	(4,309.6)	(4,308.9)
Dividends paid (common & pref)	(1,381.9)	(2,072.8)	(2,251.7)	(2,749.6)
Inc/(dec) in debt	586.8	(3,331.2)	(3,936.0)	(4,628.4)
Other financing cash flows	(1,879.2)	0.0	0.0	0.0
Cash flow from financing	(2,674.3)	(5,404.0)	(6,187.7)	(7,378.0)
Total cash flow	913.6	483.1	586.9	206.9
Free cash flow	4,726.9	5,887.1	6,744.2	7,553.9

Source: Company data, Goldman Sachs Research estimates.

bullish view on gold price given stronger EM wealth and expects gold price to reach US\$1,450/oz by end of 2018E. We also revise our SHFE-copper price assumption by -6% to US\$2.96/lb (or -6% to Rmb42,977/t) in 2018E, +5% to US\$3.20/lb (or +3% to Rmb48,034/t) in 2019E, +8% to US\$3.18/lb (or +6% to Rmb47,694/t) in 2020E to reflect our global team's latest LME copper price and new USD-CNY exchange rate from 6.3 to 6.8.

We revise up our Zijin net profit forecast by 15% for 2018E to a reflect higher gold price assumption partly offset by lower SHFE copper price and by 35% for 2019E for higher gold/copper price assumptions, while partly offset by higher unit cost. We expect Zijin net profit to reach Rmb5,499mn in 2019E and Rmb5,912mn in 2020E, driven by higher gold/copper price and rising output from copper. Our new 12-month target price for Zijin-H is HK\$3.9 (from HK\$3.5) and Rmb4.9 for Zijin-A (from Rmb 4.6). We upgrade Zijin H/A to Buy/Buy (prior Neutral/Neutral). Our target prices imply 44%/48% upside to current share price. We view current H/A shares as under-valued post the recent correction with - PEs at 10X/14X and PBs at 1.3X/1.9X for 2019E versus historical five-year average PEs of 16X/28X and PBs of 1.6X/2.4X. We believe Zijin is one of the best plays to benefit from both higher copper and gold prices. We estimate that if we use current spot gold (US\$1,203/oz)/SHFE copper price (US\$2.86/lb) for 2019E, current share price implies 16X/22X PE and 1.4X/2.0X PB - suggesting that current share prices only factor in current gold/copper prices.

Our target price methodologies remain unchanged, both based on historical P/B vs. ROE correlation - we update our assumptions however, an average of 2019E P/B of 1.9X/2.8X at an ROE of 14% and 2022E (when Kamoia is fully operative) P/B of 2.0X/2.8X P/B at an ROE of 13.5% from prior an average of 2019E P/B of 1.7X/2.7X at an ROE of 11% and 2022E (when Kamoia is fully operative) P/B of 2.0X/2.8X P/B at an ROE of 12% (a more sustainable ROE when Kamoia operates).

Zijin-H share price has declined by 23% during past three months versus the Hang Seng Index down by 10%. Zijin-A share price has declined by 15%, versus SH-SZ 300 Index down by 13%. Our net profit estimates are 4% higher than Bloomberg consensus in both 2019-2020E.

Key risks include: 1) Gold and copper prices: FY19E earnings change 9% for every US\$100/oz change in gold price or 4% for every US\$0.01/lb change in copper price, and 2) project execution, which is key to sustaining the company's growth profile.

Exhibit 1: 1H18A results summary - Zijin

		1H18A	1H17A	YoY	1H18E	AvE
Net Revenue	Rmb mn	49,814	37,524	33%	46,101	8%
Cost of sales	Rmb mn	(42,717)	(32,049)	33%	(39,451)	8%
Gross profit	Rmb mn	6,399	4,906	30%	5,990	7%
Other revenue	Rmb mn	303	772	-61%	137	121%
SG&A	Rmb mn	(1,918)	(1,875)	2%	(1,953)	-2%
Other operating Costs	Rmb mn	(318)	(238)	34%	(280)	14%
Operating profit	Rmb mn	4,465	3,564	25%	3,893	15%
Finance costs	Rmb mn	(660)	(1,218)	-46%	(877)	-25%
Share of associates	Rmb mn	(28)	17	n.a	(15)	85%
Non-Operating income/exp	Rmb mn	3	(212)	n.a	-	n.a
PBT	Rmb mn	3,781	2,151	76%	3,002	26%
tax	Rmb mn	(712)	(388)	83%	(868)	-18%
Minority	Rmb mn	(542)	(257)	111%	(249)	n.a
Net Profit	Rmb mn	2,526	1,505	68%	1,885	34%
One offs	Rmb mn	(62)	(198)	-68%	-	n.a
Net Profit(recurring)	Rmb mn	2,577	1,668	55%	1,885	37%
EPS	Rmb/sh	0.110	0.069	59%	0.082	34%
EPS-recurring	Rmb/sh	0.112	0.076	47%	0.082	37%
Sales volume						
Mined gold	t	16.1	18.1	-11%	18.7	-14%
Mined copper	kt	118.0	93.9	26%	122.5	-4%
Zinc concentrate		153.1	145.4	5%	137.2	12%
Output						
Mined gold	t	16.9	18.9	-10%	18.7	-10%
Mined copper	kt	119.4	91.5	30%	122.5	-3%
Zinc concentrate	kt	148.3	141.9	5%	137.2	8%
Benchmark price						
Gold	US\$/oz	1,318	1,240	6%	1,227	7%
Copper SHFE	US\$/lb	3.17	2.62	21%	3.28	-3%
ASP						
Mined gold	Rmb/g	254	240	6%	249	2%
Mined copper	Rmb/t	36,914	32,558	13%	36,494	1%
COGS						
Mined gold	Rmb/g	172	162	6%	168	2%
Mined copper	Rmb/t	17,405	16,431	6%	17,082	2%
A/R days	days	9	11	-22%		
A/P days	days	16	19	-19%		
Inv days	days	50	68	-27%		
Operating cash flow	Rmb mn	4,981	3,306	51%		
Investing cash flow	Rmb mn	(908)	(3,611)	-75%		
Net debt	Rmb mn	28,769	31,213	-8%		
Net Gearing	%	82%	89%	-7%		

Company data, Goldman Sachs Global Investment Research

Exhibit 2: Key assumptions and financials - Zijin

Key assumptions and financials - ZIJIN		2015A	2016A	2017A	2018E	2019E	2020E
Gold	US\$/oz	1,160	1,247	1,259	1,340	1,450	1,525
Cu-SHFE	US\$/lb	2.53	2.24	2.82	2.96	3.20	3.18
Zinc	US\$/lb	0.88	0.95	1.23	1.40	1.35	1.22
Gold-selfmine-sales	t	35.6	41.6	37.4	36.8	35.7	34.5
	mn oz	1.1	1.3	1.2	1.1	1.1	1.1
Cu-selfmine-sales	kt	151.2	151.2	208.2	244.5	292.1	340.4
Zn in conc-sales	kt	177.2	244.4	279.6	274.6	274.6	274.6
ASP - Au	US\$/oz	1,064	1,098	1,123	1,270	1,307	1,374
ASP - Cu cathode	US\$/t	2.52	2.22	2.75	2.95	3.20	3.18
Unit cash cost-Au	US\$/oz	694	750	767	849	874	904
Unit COGS-Cu	US\$/t	1.26	1.13	1.12	1.22	1.21	1.25
% gold profit	%	54%	50%	31%	39%	35%	35%
EBIT	Rmb mn	2,933	2,801	7,069	8,937	10,971	11,462
EBITDA	Rmb mn	6,025	6,686	11,126	12,667	14,779	15,340
Net Profit	Rmb mn	1,655	1,839	3,508	4,503	5,499	5,912
Net Profit-recurring	Rmb mn	1,466	2,698	4,801	4,554	5,499	5,912
EPS	Rmb/sh	0.077	0.085	0.156	0.196	0.239	0.257
EPS-recurring	Rmb/sh	0.068	0.125	0.214	0.198	0.239	0.257
BV	Rmb/sh	1.276	1.289	1.559	1.625	1.766	1.904
Operating cash flow	Rmb mn	10,269	8,602	9,764	10,227	11,084	11,894
Investing cash flow	Rmb mn	(8,693)	(8,479)	(5,948)	(4,340)	(4,310)	(4,309)
Free cash flow	Rmb mn	1,576	123	3,817	5,887	6,775	7,585
ROE	%	6.0%	6.7%	11.2%	12.4%	14.1%	14.0%
ROE-recurring	%	5.3%	9.8%	15.3%	12.6%	14.1%	14.0%
ROIC	%	3%	3%	7%	10%	12%	12%
Net debt	Rmb mn	31,311	38,685	31,213	27,398	22,875	18,040
net debt/equity	%	114%	139%	89%	73%	56%	41%
Gross profit-gold	Rmb mn	2,901	3,694	3,432	4,268	4,461	4,677
Gross profit-copper	Rmb mn	2,093	3,486	4,634	4,942	7,207	7,964
Gross profit-zinc	Rmb mn	691	1,402	3,071	3,101	3,090	2,678
Gross profit-others	Rmb mn	611	486	2,039	2,167	2,204	2,269

Source: Company data, Goldman Sachs Global Investment Research

Disclosure Appendix

Reg AC

We, Joy Zhang and Trina Chen, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

Unless otherwise stated, the individuals listed on the cover page of this report are analysts in Goldman Sachs' Global Investment Research division.

GS Factor Profile

The Goldman Sachs Factor Profile provides investment context for a stock by comparing key attributes to the market (i.e. our coverage universe) and its sector peers. The four key attributes depicted are: Growth, Financial Returns, Multiple (e.g. valuation) and Integrated (a composite of Growth, Financial Returns and Multiple). Growth, Financial Returns and Multiple are calculated by using normalized ranks for specific metrics for each stock. The normalized ranks for the metrics are then averaged and converted into percentiles for the relevant attribute. The precise calculation of each metric may vary depending on the fiscal year, industry and region, but the standard approach is as follows:

Growth is based on a stock's forward-looking sales growth, EBITDA growth and EPS growth (for financial stocks, only EPS and sales growth), with a higher percentile indicating a higher growth company. **Financial Returns** is based on a stock's forward-looking ROE, ROCE and CROCI (for financial stocks, only ROE), with a higher percentile indicating a company with higher financial returns. **Multiple** is based on a stock's forward-looking P/E, P/B, price/dividend (P/D), EV/EBITDA, EV/FCF and EV/Debt Adjusted Cash Flow (DACF) (for financial stocks, only P/E, P/B and P/D), with a higher percentile indicating a stock trading at a higher multiple. The **Integrated** percentile is calculated as the average of the Growth percentile, Financial Returns percentile and (100% - Multiple percentile).

Financial Returns and Multiple use the Goldman Sachs analyst forecasts at the fiscal year-end at least three quarters in the future. Growth uses inputs for the fiscal year at least seven quarters in the future compared with the year at least three quarters in the future (on a per-share basis for all metrics).

For a more detailed description of how we calculate the GS Factor Profile, please contact your GS representative.

M&A Rank

Across our global coverage, we examine stocks using an M&A framework, considering both qualitative factors and quantitative factors (which may vary across sectors and regions) to incorporate the potential that certain companies could be acquired. We then assign a M&A rank as a means of scoring companies under our rated coverage from 1 to 3, with 1 representing high (30%-50%) probability of the company becoming an acquisition target, 2 representing medium (15%-30%) probability and 3 representing low (0%-15%) probability. For companies ranked 1 or 2, in line with our standard departmental guidelines we incorporate an M&A component into our target price. M&A rank of 3 is considered immaterial and therefore does not factor into our price target, and may or may not be discussed in research.

Quantum

Quantum is Goldman Sachs' proprietary database providing access to detailed financial statement histories, forecasts and ratios. It can be used for in-depth analysis of a single company, or to make comparisons between companies in different sectors and markets.

GS SUSTAIN

GS SUSTAIN is a global investment strategy focused on the generation of long-term alpha through identifying high quality industry leaders. The GS SUSTAIN 50 list includes leaders we believe to be well positioned to deliver long-term outperformance through superior returns on capital, sustainable competitive advantage and effective management of ESG risks vs. global industry peers. Candidates are selected largely on a combination of quantifiable analysis of these three aspects of corporate performance.

Disclosures

Coverage group(s) of stocks by primary analyst(s)

Joy Zhang: A-share Basic Materials, China Basic Materials. Trina Chen: A-share Basic Materials, China Basic Materials.

A-share Basic Materials: Aluminum Corp. of China (A), Angang Steel (A), Anhui Conch Cement (A), Baoshan Iron & Steel, BBMG Corp. (A), China Coal Energy (A), China Molybdenum Co. (A), Jiangxi Copper (A), Maanshan Iron & Steel (A), Yanzhou Coal Mining (A), Zijin Mining (A).

China Basic Materials: Aluminum Corp. of China (H), Angang Steel (H), Anhui Conch Cement (H), BBMG Corp. (H), China Coal Energy (H), China Hongqiao Group, China Molybdenum Co. (H), China National Building Material, China Resources Cement Holdings, Jiangxi Copper (H), Lee & Man Paper Manufacturing Ltd., Maanshan Iron & Steel (H), MMG Ltd, Nine Dragons Paper Holdings, West China Cement, Yanzhou Coal Mining (H), Zhaojin Mining Industry, Zijin Mining (H).

Company-specific regulatory disclosures

The following disclosures relate to relationships between The Goldman Sachs Group, Inc. (with its affiliates, "Goldman Sachs") and companies covered by the Global Investment Research Division of Goldman Sachs and referred to in this research.

Goldman Sachs had a non-securities services client relationship during the past 12 months with: Zijin Mining (A) (Rmb3.31) and Zijin Mining (H) (HK\$2.70)

Goldman Sachs makes a market in the securities or derivatives thereof: Zijin Mining (A) (Rmb3.31) and Zijin Mining (H) (HK\$2.70)

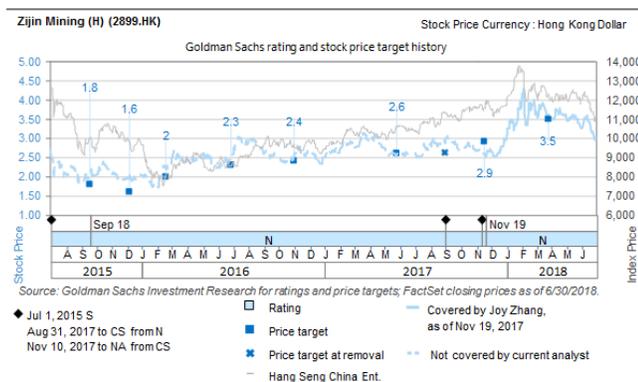
Distribution of ratings/investment banking relationships

Goldman Sachs Investment Research global Equity coverage universe

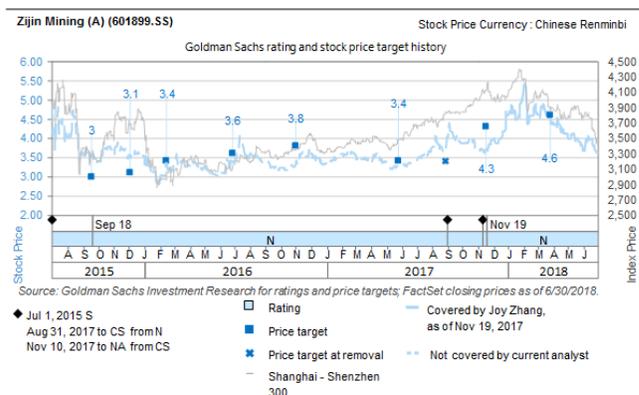
	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
Global	35%	53%	12%	63%	56%	51%

As of July 1, 2018, Goldman Sachs Global Investment Research had investment ratings on 2,851 equity securities. Goldman Sachs assigns stocks as Buys and Sells on various regional Investment Lists; stocks not so assigned are deemed Neutral. Such assignments equate to Buy, Hold and Sell for the purposes of the above disclosure required by the FINRA Rules. See ‘Ratings, Coverage groups and views and related definitions’ below. The Investment Banking Relationships chart reflects the percentage of subject companies within each rating category for whom Goldman Sachs has provided investment banking services within the previous twelve months.

Price target and rating history chart(s)



The price targets shown should be considered in the context of all prior published Goldman Sachs research, which may or may not have included price targets, as well as developments relating to the company, its industry and financial markets.



The price targets shown should be considered in the context of all prior published Goldman Sachs research, which may or may not have included price targets, as well as developments relating to the company, its industry and financial markets.

Regulatory disclosures

Disclosures required by United States laws and regulations

See company-specific regulatory disclosures above for any of the following disclosures required as to companies referred to in this report: manager or co-manager in a pending transaction; 1% or other ownership; compensation for certain services; types of client relationships; managed/co-managed public offerings in prior periods; directorships; for equity securities, market making and/or specialist role. Goldman Sachs trades or may trade as a principal in debt securities (or in related derivatives) of issuers discussed in this report.

The following are additional required disclosures: **Ownership and material conflicts of interest:** Goldman Sachs policy prohibits its analysts, professionals reporting to analysts and members of their households from owning securities of any company in the analyst's area of coverage.

Analyst compensation: Analysts are paid in part based on the profitability of Goldman Sachs, which includes investment banking revenues. **Analyst as officer or director:** Goldman Sachs policy generally prohibits its analysts, persons reporting to analysts or members of their households from serving as an officer, director or advisor of any company in the analyst's area of coverage. **Non-U.S. Analysts:** Non-U.S. analysts may not be associated persons of Goldman Sachs & Co. LLC and therefore may not be subject to FINRA Rule 2241 or FINRA Rule 2242 restrictions on communications with subject company, public appearances and trading securities held by the analysts.

Distribution of ratings: See the distribution of ratings disclosure above. **Price chart:** See the price chart, with changes of ratings and price targets in prior periods, above, or, if electronic format or if with respect to multiple companies which are the subject of this report, on the Goldman Sachs website at <http://www.gs.com/research/hedge.html>.

Additional disclosures required under the laws and regulations of jurisdictions other than the United States

The following disclosures are those required by the jurisdiction indicated, except to the extent already made above pursuant to United States laws and regulations. **Australia:** Goldman Sachs Australia Pty Ltd and its affiliates are not authorised deposit-taking institutions (as that term is defined in the Banking Act 1959 (Cth)) in Australia and do not provide banking services, nor carry on a banking business, in Australia. This research, and any access to it, is intended only for “wholesale clients” within the meaning of the Australian Corporations Act, unless otherwise agreed by Goldman Sachs. In producing research reports, members of the Global Investment Research Division of Goldman Sachs Australia may attend site visits and other meetings hosted by the companies and other entities which are the subject of its research reports. In some instances the costs of such site visits or meetings may be met in part or in whole by the issuers concerned if Goldman Sachs Australia considers it is appropriate and reasonable in the specific circumstances relating to the site visit or meeting. To the extent that the contents of this document contains any financial product advice, it is general advice only and has been prepared by Goldman Sachs without taking into account a client's objectives, financial situation or needs. A client should, before acting on any such advice, consider the appropriateness of the advice having regard to the client's own objectives, financial situation and needs.

Brazil: Disclosure information in relation to CVM Instruction 483 is available at <http://www.gs.com/worldwide/brazil/area/gir/index.html>. Where applicable, the Brazil-registered analyst primarily responsible for the content of this research report, as defined in Article 16 of CVM Instruction 483, is the first author named at the beginning of this report, unless indicated otherwise at the end of the text. **Canada:** Goldman Sachs Canada Inc. is an affiliate of The Goldman Sachs Group Inc. and therefore is included in the company specific disclosures relating to Goldman Sachs (as defined above). Goldman Sachs Canada Inc. has approved of, and agreed to take responsibility for, this research report in Canada if and to the extent that Goldman Sachs Canada Inc. disseminates this research report to its clients. **Hong Kong:** Further information on the securities of covered companies referred to in this research may be obtained on request from Goldman Sachs (Asia) L.L.C. **India:** Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (India) Securities Private Limited, Research Analyst - SEBI Registration Number INH000001493, 951-A, Rational House, Appasaheb Marathe Marg, Prabhadevi, Mumbai 400 025, India, Corporate Identity Number U74140MH2006FTC160634, Phone +91 22 6616 9000, Fax +91 22 6616 9001. Goldman Sachs may beneficially own 1% or more of the securities (as such term is defined in clause 2 (h) the Indian Securities Contracts (Regulation) Act, 1956) of the subject company or companies referred to in this research report. **Japan:** See below. **Korea:** Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C., Seoul Branch. **New Zealand:** Goldman Sachs New Zealand Limited and its affiliates are neither “registered banks” nor “deposit takers” (as defined in the Reserve Bank of New Zealand Act 1989) in New Zealand. This research, and any access to it, is intended for “wholesale clients” (as defined in the Financial Advisers Act 2008) unless otherwise agreed by Goldman Sachs. **Russia:** Research reports distributed in the Russian Federation are not advertising as defined in the Russian legislation, but are information and analysis not having product promotion as their main purpose and do not provide appraisal within the meaning of the Russian legislation on appraisal activity. **Singapore:** Further information on the covered companies referred to in this research may be obtained from Goldman Sachs (Singapore) Pte. (Company Number: 198602165W). **Taiwan:** This material is for reference only and must not be reprinted without permission. Investors should carefully consider their own investment risk.

Investment results are the responsibility of the individual investor. **United Kingdom:** Persons who would be categorized as retail clients in the United Kingdom, as such term is defined in the rules of the Financial Conduct Authority, should read this research in conjunction with prior Goldman Sachs research on the covered companies referred to herein and should refer to the risk warnings that have been sent to them by Goldman Sachs International. A copy of these risks warnings, and a glossary of certain financial terms used in this report, are available from Goldman Sachs International on request.

European Union: Disclosure information in relation to Article 4 (1) (d) and Article 6 (2) of the European Commission Directive 2003/125/EC is available at <http://www.gs.com/disclosures/europeanpolicy.html> which states the European Policy for Managing Conflicts of Interest in Connection with Investment Research.

Japan: Goldman Sachs Japan Co., Ltd. is a Financial Instrument Dealer registered with the Kanto Financial Bureau under registration number Kinsho 69, and a member of Japan Securities Dealers Association, Financial Futures Association of Japan and Type II Financial Instruments Firms Association. Sales and purchase of equities are subject to commission pre-determined with clients plus consumption tax. See company-specific disclosures as to any applicable disclosures required by Japanese stock exchanges, the Japanese Securities Dealers Association or the Japanese Securities Finance Company.

Ratings, coverage groups and views and related definitions

Buy (B), Neutral (N), Sell (S) -Analysts recommend stocks as Buys or Sells for inclusion on various regional Investment Lists. Being assigned a Buy or Sell on an Investment List is determined by a stock's total return potential relative to its coverage. Any stock not assigned as a Buy or a Sell on an Investment List with an active rating (i.e., a stock that is not Rating Suspended, Not Rated, Coverage Suspended or Not Covered), is deemed Neutral. Each regional Investment Review Committee manages various regional Investment Lists to a global guideline of 25%-35% of stocks as Buy and 10%-15% of stocks as Sell; however, the distribution of Buys and Sells in any particular analyst's coverage group may vary as determined by the regional Investment Review Committee. Additionally, each Investment Review Committee manages Regional Conviction lists, which represent investment recommendations focused on the size of the total return potential and/or the likelihood of the realization of the return across their respective areas of coverage. The addition or removal of stocks from such Conviction lists do not represent a change in the analysts' investment rating for such stocks.

Total return potential represents the upside or downside differential between the current share price and the price target, including all paid or anticipated dividends, expected during the time horizon associated with the price target. Price targets are required for all covered stocks. The total return potential, price target and associated time horizon are stated in each report adding or reiterating an Investment List membership.

Coverage groups and views: A list of all stocks in each coverage group is available by primary analyst, stock and coverage group at <http://www.gs.com/research/hedge.html>. The analyst assigns one of the following coverage views which represents the analyst's investment outlook on the coverage group relative to the group's historical fundamentals and/or valuation. **Attractive (A).** The investment outlook over the following 12 months is favorable relative to the coverage group's historical fundamentals and/or valuation. **Neutral (N).** The investment outlook over the following 12 months is neutral relative to the coverage group's historical fundamentals and/or valuation. **Cautious (C).** The investment outlook over the following 12 months is unfavorable relative to the coverage group's historical fundamentals and/or valuation.

Not Rated (NR). The investment rating and target price have been removed pursuant to Goldman Sachs policy when Goldman Sachs is acting in an advisory capacity in a merger or strategic transaction involving this company and in certain other circumstances. **Rating Suspended (RS).** Goldman Sachs Research has suspended the investment rating and price target for this stock, because there is not a sufficient fundamental basis for determining, or there are legal, regulatory or policy constraints around publishing, an investment rating or target. The previous investment rating and price target, if any, are no longer in effect for this stock and should not be relied upon. **Coverage Suspended (CS).** Goldman Sachs has suspended coverage of this company. **Not Covered (NC).** Goldman Sachs does not cover this company. **Not Available or Not Applicable (NA).** The information is not available for display or is not applicable. **Not Meaningful (NM).** The information is not meaningful and is therefore excluded.

Global product; distributing entities

The Global Investment Research Division of Goldman Sachs produces and distributes research products for clients of Goldman Sachs on a global basis. Analysts based in Goldman Sachs offices around the world produce equity research on industries and companies, and research on macroeconomics, currencies, commodities and portfolio strategy. This research is disseminated in Australia by Goldman Sachs Australia Pty Ltd (ABN 21 006 797 897); in Brazil by Goldman Sachs do Brasil Corretora de Títulos e Valores Mobiliários S.A.; Ombudsman Goldman Sachs Brazil: 0800 727 5764 and / or ouvidoriagoldmansachs@gs.com. Available Weekdays (except holidays), from 9am to 6pm. Ouvidoria Goldman Sachs Brasil: 0800 727 5764 e/ou ouvidoriagoldmansachs@gs.com. Horário de funcionamento: segunda-feira à sexta-feira (exceto feriados), das 9h às 18h; in Canada by either Goldman Sachs Canada Inc. or Goldman Sachs & Co. LLC; in Hong Kong by Goldman Sachs (Asia) L.L.C.; in India by Goldman Sachs (India) Securities Private Ltd.; in Japan by Goldman Sachs Japan Co., Ltd.; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs New Zealand Limited; in Russia by OOO Goldman Sachs; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman Sachs & Co. LLC. Goldman Sachs International has approved this research in connection with its distribution in the United Kingdom and European Union.

European Union: Goldman Sachs International authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority, has approved this research in connection with its distribution in the European Union and United Kingdom; Goldman Sachs AG and Goldman Sachs International Zweigniederlassung Frankfurt, regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht, may also distribute research in Germany.

General disclosures

This research is for our clients only. Other than disclosures relating to Goldman Sachs, this research is based on current public information that we consider reliable, but we do not represent it is accurate or complete, and it should not be relied on as such. The information, opinions, estimates and forecasts contained herein are as of the date hereof and are subject to change without prior notification. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than certain industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

Goldman Sachs conducts a global full-service, integrated investment banking, investment management, and brokerage business. We have investment banking and other business relationships with a substantial percentage of the companies covered by our Global Investment Research Division. Goldman Sachs & Co. LLC, the United States broker dealer, is a member of SIPC (<http://www.sipc.org>).

Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and principal trading desks that reflect opinions that are contrary to the opinions expressed in this research. Our asset management area, principal trading desks and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

The analysts named in this report may have from time to time discussed with our clients, including Goldman Sachs salespersons and traders, or may discuss in this report, trading strategies that reference catalysts or events that may have a near-term impact on the market price of the equity securities discussed in this report, which impact may be directionally counter to the analyst's published price target expectations for such stocks. Any such

trading strategies are distinct from and do not affect the analyst's fundamental equity rating for such stocks, which rating reflects a stock's return potential relative to its coverage group as described herein.

We and our affiliates, officers, directors, and employees, excluding equity and credit analysts, will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives, if any, referred to in this research.

The views attributed to third party presenters at Goldman Sachs arranged conferences, including individuals from other parts of Goldman Sachs, do not necessarily reflect those of Global Investment Research and are not an official view of Goldman Sachs.

Any third party referenced herein, including any salespeople, traders and other professionals or members of their household, may have positions in the products mentioned that are inconsistent with the views expressed by analysts named in this report.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Clients should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The price and value of investments referred to in this research and the income from them may fluctuate. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors. Investors should review current options disclosure documents which are available from Goldman Sachs sales representatives or at <http://www.theocc.com/about/publications/character-risks.jsp>. Transaction costs may be significant in option strategies calling for multiple purchase and sales of options such as spreads. Supporting documentation will be supplied upon request.

Differing Levels of Service provided by Global Investment Research: The level and types of services provided to you by the Global Investment Research division of GS may vary as compared to that provided to internal and other external clients of GS, depending on various factors including your individual preferences as to the frequency and manner of receiving communication, your risk profile and investment focus and perspective (e.g., marketwide, sector specific, long term, short term), the size and scope of your overall client relationship with GS, and legal and regulatory constraints. As an example, certain clients may request to receive notifications when research on specific securities is published, and certain clients may request that specific data underlying analysts' fundamental analysis available on our internal client websites be delivered to them electronically through data feeds or otherwise. No change to an analyst's fundamental research views (e.g., ratings, price targets, or material changes to earnings estimates for equity securities), will be communicated to any client prior to inclusion of such information in a research report broadly disseminated through electronic publication to our internal client websites or through other means, as necessary, to all clients who are entitled to receive such reports.

All research reports are disseminated and available to all clients simultaneously through electronic publication to our internal client websites. Not all research content is redistributed to our clients or available to third-party aggregators, nor is Goldman Sachs responsible for the redistribution of our research by third party aggregators. For research, models or other data related to one or more securities, markets or asset classes (including related services) that may be available to you, please contact your GS representative or go to <http://360.gs.com>.

Disclosure information is also available at <http://www.gs.com/research/hedge.html> or from Research Compliance, 200 West Street, New York, NY 10282.

© 2018 Goldman Sachs.

No part of this material may be (i) copied, photocopied or duplicated in any form by any means or (ii) redistributed without the prior written consent of The Goldman Sachs Group, Inc.