

23 November 2018

China/Hong Kong

EQUITIES

AShare
Research000513 CH Outperform
Price (at 13:32, 22 Nov 2018 GMT) Rmb34.22

Valuation - NAV	Rmb	22.60
12-month target	Rmb	40.72
Upside/Downside	%	+19.0
12-month TSR	%	+20.5

GICS sector

Pharmaceuticals, Biotechnology & Life Sciences

Market cap	Rmbm	24,611
Market cap	US\$m	3,437
Free float	%	55
30-day avg turnover	US\$m	27.6
Number shares on issue	m	719.2

Investment fundamentals

Year end 31 Dec		2017A	2018E	2019E	2020E
Revenue	m	8,402	8,914	10,204	11,352
EBIT	m	1,187	1,213	1,422	1,580
EBIT growth	%	27.6	2.2	17.2	11.1
Reported profit	m	4,429	1,173	1,287	1,368
Adjusted profit	m	820	1,073	1,287	1,368
EPS rep	Rmb	4.12	1.63	1.79	1.90
EPS rep growth	%	503.4	-60.4	9.7	6.3
EPS adj	Rmb	1.15	1.49	1.79	1.90
EPS adj growth	%	28.3	95.2	19.9	6.3
PER rep	x	8.3	21.0	19.1	18.0
PER adj	x	44.7	22.9	19.1	18.0
Total DPS	Rmb	1.18	0.45	0.54	0.57
Total div yield	%	3.5	1.3	1.6	1.7
ROA	%	9.0	7.8	9.1	9.4
ROE	%	9.5	9.9	11.4	11.1
EV/EBITDA	x	16.7	11.7	10.3	9.5
Net debt/equity	%	-57.7	-49.1	-50.6	-52.6
P/BV	x	3.0	2.3	2.1	1.9

Source: FactSet, Macquarie Research, November 2018
(all figures in Rmb unless noted, TP in CNY)Livzon Pharma (A-Share) (000513 CH)
West saving the East

Key points

- ▶ The decline of Shenqi Fuzheng and Likangle should continue into 2019...
- ▶ ...offset by a rise in western drugs in gastrointestinal & hormone diseases.
- ▶ We initiate coverage at Outperform and a TP of Rmb40.72, 19% upside.

East in trouble

Livzon has had a tough 2018, facing a harsh policy environment and weak stock market sentiment as well as product-specific issues with no remedies in the near term. Since late 2016, authorities have been more seriously supervising the usage of "adjuvant TCM" at hospitals, resulting in a severe sales decline from the peak. Adjuvant means drugs that supplement but do not have a clear clinical benefit to patients. Shenqi Fuzheng, which falls under this category, accounted for 19% of the company's 2017 revenue. We see a stable gross margin, at 80%, but a 37% decline in revenue for 2018 and another 15% in 2019. Another product, Likangle, which is the mouse nerve growth factor, also will suffer a decline of 15% in 2018, according to our forecasts. It faces competition from three other manufacturers and has the lowest market share.

West comes to the rescue

Yilian, with active drug ingredient ilaprazole, should post sales of Rmb620m in 2018, up 40% YoY. We estimate sales will hit Rmb1bn by 2020, making it the company's best-selling drug. In Livzon's traditional forte of fertility drugs, Beiyi (贝依) is doing well. Beiyi contains the extended release form of Leuprorelin (亮丙瑞林微球) using microspheres and should achieve Rmb0.73bn in sales in 2018, up 35% YoY. We project the drug to hit Rmb1bn by 2021. We believe, over the next three years, the rise of Beiyi and Yilian together should almost exactly offset the decline of Shenqi Fuzheng and Likangle combined. The former two should also enjoy higher gross margins and lower operating costs.

Blue sky of biological drugs under development

Livzon is one of the few established TCM drug companies with early exposure to the development of biological drugs. Thanks to its JV subsidiary, Zhuhai Livzon MAB Biotechnology, 51/49 owned by Livzon and its listed parentco, Joicare, the company now has a total of eight biologic candidates. They cover all of the hot targets including HER2, CD20, RANKL, PD-1 and IL-6. We estimate that if all the monoclonal antibodies can be launched successfully in the market, their peak sales potential should be around Rmb10bn, almost doubling the current scale of operations and likely enjoying 30 pts more than current gross margin.

Without a lot of near-term catalysts

We apply a 25x PE on 2019E EPS of diagnostic, GI and antibiotic drugs, and 20x on hormones, TCM, API & others to arrive at our TP of Rmb40.72, implying a 20.5% TSR. We believe the multiple is justified in view of strong earnings growth (we see 31% in 2018E and 20% in 2019E). The stock is inexpensive after a YTD stock price correction of 59%, but we do not see a lot of near-term catalysts.

Key risk

Increasingly fierce policy adversity impacting Shenqi Fuzheng.

Analysts

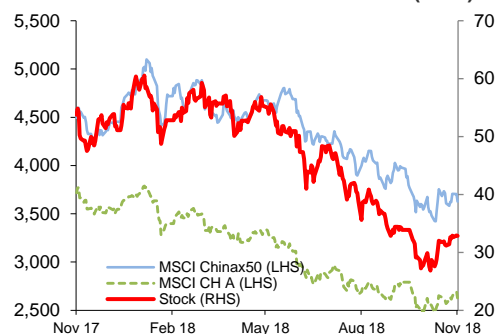
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Inside

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000513-CH vs MSCI CH and MSCI CH A (Rmb)



Source: FactSet, Macquarie Research, Nov. 2018

MQ forecast vs Consensus forecast (Rmb bn)

	2015A	2016A	2017A	2018E	2019E
Revenue	6.5	7.5	8.4	MQ 8.9	10.2
				Cons 9.3	10.5
				Dif% -4%	-3%
Net profit	0.54	0.68	0.82	MQ 1.07	1.29
				Cons 1.14	1.34
				Dif% -5%	-4%

Source: FactSet, Macquarie Research, November 2018
 MQ: Macquarie forecast, Cons: FactSet consensus

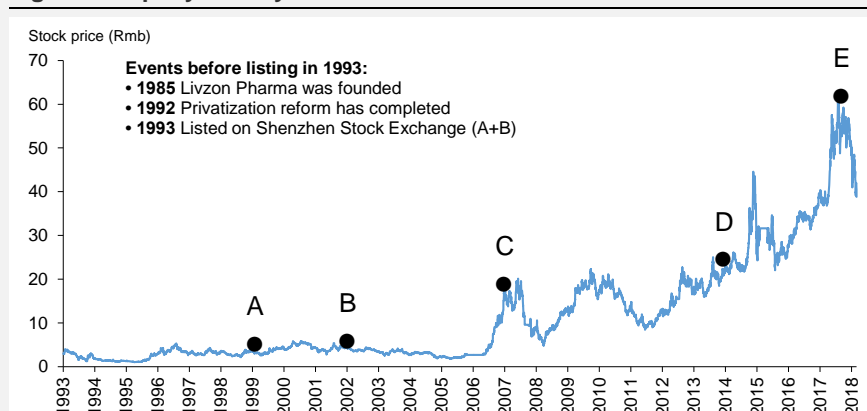
Events after listing in 1993:

- A 1999:** Shenqi Fuzheng injection was launched
- B 2002:** Acquired by Taitai Pharma (owned by Zhu Baoguo, later known as Joincare Pharma)
- C 2007:** Ilaprazole Enteric-Coated Tablet was launched
- D 2014:** Listed on main board Hong Kong Exchange
- E 2018:** Ilaprazole Sodium Injection was launched

Company profile

- Livzon develops and sells traditional Chinese medicine, western chemical and biological drugs, active pharmaceutical ingredients, and diagnostic reagents. The products cover infections, alimentary disorders, oncology, assisted reproduction and central nervous system disorders.
- The company's blockbuster drug is Shenqi Fuzheng Injection, which accounted for 19% of total FY17 revenue and an over 80% gross margin. Faced with an adverse regulatory environment, its sales fell 6% in FY17, followed by 36% during the first 9 months of 2018, accompanied by total margin erosion of 1 ppt.
- Founded in 1985, Livzon was listed in 1993 on the Shenzhen Stock Exchange with A + B shares, the first pharmaceutical stock in China with shares listed in two currencies. In 1999, its first signature product, Shenqi Fuzheng Injection, was launched. In 2002, Livzon was acquired by Shenzhen Taitai Pharma (currently known as Joincare Pharma), which was owned by Zhu Baoguo, now the controlling shareholder and chairman of Livzon. In 2014, the company was listed in HK and cancelled its listing of B shares. In 2018, Ilaprazole Sodium was launched, which should be Livzon's next key growth driver.
- Chairman Zhu Baoguo started his career as a technician at Xinxiang No.5 Chemical Factory in 1985, after graduating from Henan Normal University with a Bachelor's degree in chemistry. From 1986 to 1992, he worked in Shenzhen at a JV with a foreign company, where he was inspired by the entrepreneurial spirit in Shenzhen. He started his own company Taitai Pharma in 1993, which grew quickly and was listed in Shanghai in 2001. In 2002, his company acquired Livzon, which had 2x the revenue of Taitai. Taitai is now the largest shareholder of Livzon with a 44.81% stake.
- Livzon has a dynamic pipeline portfolio ranging across all its businesses. Shenqi Fuzheng Injection has been granted FDA approval for phase 1 clinical trials using its extended release microspheres technology. In the space of biological drugs, Livzon has 13 on-going projects for MAB and 1 CAR-T project, with 6 in the pre-clinical phase, 1 IND approved and 7 in clinical trials. It set up Livzon MABPHarm Inc as a 51/49 JV between Livzon and Taitai.
- From 2014 to 2017, the CAGR of revenue and earnings was 6% and 31%, respectively. TCM (mainly Shenqi), API and GI contributed 23%, 24% and 15% of 2017 revenue. We expect revenue and earnings to increase by 6% and 31% in 2018, as its gastrointestinal drugs and hormones performed well to offset the substantial drop of Shenqi.

Fig 1 Company History



Source: FactSet, Macquarie Research, November 2018, priced as of 22 November 2018

West saving the East

East in trouble

Shenqi Fuzheng (参芪扶正)



Traditional Chinese Medicines (TCM) or Proprietary Chinese Medicines (PCM) cannot be easily put into a single group with a well-defined boundary. The more easily defined TCMs are 1) TCM decoction pieces (dried bulk pieces to be brewed), 2) TCM granules (power of single ingredient, which requires doctor's prescriptions) and 3) finished OTC TCM (combination of several ingredients sold as a supplement). The more tricky ones are 4) compounds extracted from plants and animals with more specific indications and prescribed by doctors. Some of them are injections administered at hospitals. Many of them provide a "protection" of cells and tissues against acute attacks or chronic disorders, which can be easily explained in western medicine. 1, 2 and 3 are less controversial with 1 and 2 allowing hospitals to mark up 15% as their profits, a practice that is banned for all other pharmaceutical and medical products. 3 is often paid out of the pocket and does not utilize the budget of national insurance coverage. 2 is increasingly accepted as a convenient way to treat chronic disorders, for which western medicine cannot effectively eradicate the underlying causes.

Xueshuantong (血栓通)



Medicines discussed in 4 are not even called TCM, even though their usage most likely originated in China and was not popular in mainstream western medicine. In the past, they might have been branded as modernized Chinese medicine due to the use of more sophisticated methods of extraction, filtration and sterilisation. According to our research, there are at least 8 such products with sales of over Rmb2bn per year, a very impressive figure, in our view, considering the best-selling drugs, Lipitor and Plavix, only pocketed Rmb6bn and Rmb5.6bn, respectively, through hospital sales in 2017. They are:

- Shenqi Fuzheng (参芪扶正) by Livzon with over Rmb1.5bn in sales at its peak in 2017 but likely dropped to Rmb1bn in 2018.
- NBP (恩必普)—butylphthalide (丁苯酞) capsule by CSPC Pharmaceutical with over Rmb3.5bn sales per year,
- Tianqingganmei (天晴甘美), Tianqingganping (天晴甘平) and Ganlixin (甘利欣) by Sino Biopharmaceutical with combined sales of over Rmb2bn per year,
- Aodejing (奥德金)—Deproteinised calf blood serum (小牛血清去蛋白) injection by Shanghai Fosun Pharmaceutical Group (2196 HK, Not Rated) with over Rmb1bn sales per year,
- Beitong (倍通)--danhong (丹红) injection by Shandong Buchang (603858-CN, not-rated) with over Rmb4bn sales per year,
- Xueshuantong (血栓通) capsule by Guangxi Wuzhou Zhongheng (600252-CN, not rated) with over Rmb4bn sales per year,
- Xuesaitong (血塞通) tablet by KPC Pharma (600422-CN, not rated) and ZBD Pharma (603567-CN, not rated),
- Dansheng Duofensuan (注射用丹参多酚) by Green Valley (private) with over Rmb3.5bn sales per year,
- Xiyanping (喜炎平) injection by Qingfeng Pharmaceutical (private) with over Rmb1bn sales per year,
- Odemei (欧迪美)—cattle encephalon glycoside and ignotin injection by Sihuan Pharmaceutical (460-HK, not rated) with over Rmb2bn sales per year and,
- Shuttie (丹参川芎嗪)—Danshen Chuanxiongqin by Guizhou Baite (private) with annual sales of over Rmb2bn every year.

Since late 2016, authorities have been more seriously supervising the usage of so-called adjuvant TCM at hospitals, resulting in a sales decline of 30-50% from their peak. Adjuvant drugs supplement but do not have clear clinical benefits to the patients. However, we find that the definition is blurred. NBP and Aodejing seem to continue to grow and receive support from both patients and doctors, both inside and outside of the hospitals.

For Livzon's Shenqi Fuzheng, we project a 37% decline in sales in 2018, another 15% decline in 2019 and a continuous slide until it reaches zero 10 years later. We believe this is an overly cautious scenario already.

For Livzon's Shenqi Fuzheng, we project another 15% sales decline in 2019 and continuous slide until it reaches zero 10 years later.

Source: Company website
(authorized by management),
November 2018

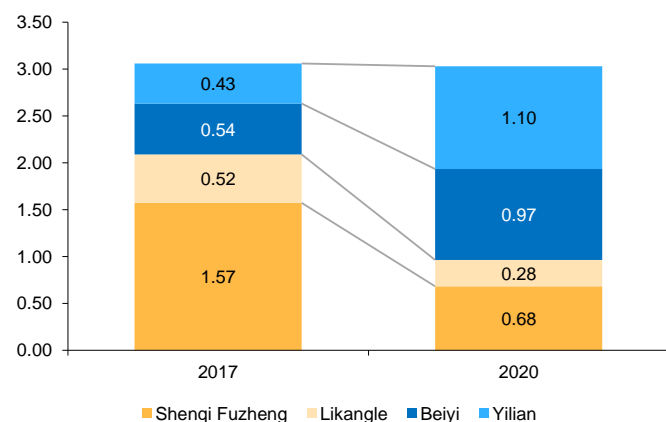
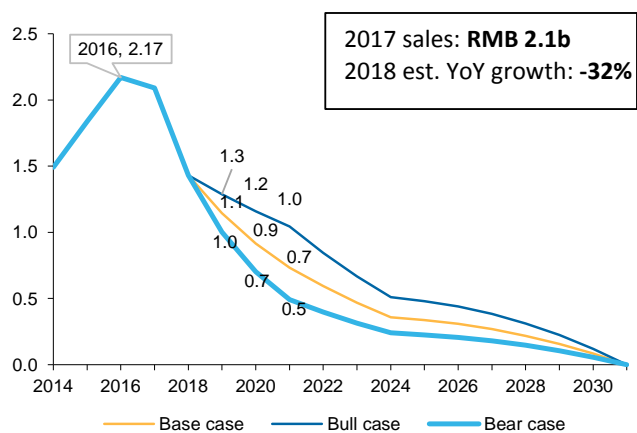
West comes to the rescue

Besides Shenqi Fuzheng, sales of another major product, Likangle, is also trending down. The two together contributed Rmb2bn in 2017, and we expect this to drop to Rmb1.4bn in 2018 and Rmb1.2bn in 2019. Fortunately, the company had made plans to enter other therapeutic areas with new products in order to mitigate the regulatory risk associated with TCM injection drugs and adjuvant drugs.

The new emerging segments for Livzon are gastrointestinal and fertility products. Yilian (壹丽安) contains the drug, ilaprazole, which belongs to the prazole family. It is one of the few Class 1.1 innovative drugs approved in China in the gastrointestinal field. The new injection form has just launched and, together with the tablet form, we estimate it should record sales of Rmb620m in 2018, up 40% YoY. We forecast it to achieve sales of Rmb1bn by 2020, becoming the best-selling drug of Livzon. Another drug from the same class but that is generic – Libeile (丽倍乐) – should also perform well with peak sales of Rmb0.5bn, we believe.

Fig 2 Scenarios of Shenqi Fuzheng plus Likangle (Rmb bn)

Fig 3 Beiyl and Yili'an could make up for decline (Rmb bn)



Source: Company data, Macquarie Research, November 2018

Source: Company data, Macquarie Research, November 2018

In Livzon's traditional forte of fertility drugs, Beiyl (贝依) is doing well. Beiyl contains the extended release form of Leuprorelin (亮丙瑞林微球) using microspheres and we believe should achieve Rmb0.73bn sales in 2018, up 35% YoY. We project the drug to hit Rmb1bn by 2021. We believe, over the next three years, the rise of Beiyl and Yilian together should almost exactly offset the decline of Shenqi Fuzheng and Likangle combined. The former two should also enjoy higher gross margin and lower operating costs.

The company is a leader in the fertilization treatment field, and they have also been the leading pharma in developing extended release dosage. Besides Beiyl, Livzon is developing recombinant human gonadotropins with better efficacy, and other drug candidates in the central nervous system area, as well as employing its extended release technology in other therapeutic areas.

Blue sky of antibodies

Livzon is one of the few established TCM drug companies with early exposure to the development of biological drugs. Thanks to its JV subsidiary, Zhuhai Livzon MAB Biotechnology, 51/49 with Livzon's listed parentco, Joicare, the company now has a total of 8 biologic candidates. They cover all of the hot targets including HER2, CD20, RANKL, PD-1 and IL-6. While management target the first launch of PD1 in 2019, we are more conservative and assume a full-year contribution in 2020, followed by Adalimumab and Rituximab in 2021. Triptorelin extended release form should also be approved in the same year.

The company has recruited a team of professionals with experience in global pharmaceutical and biological companies (Amgen, Biogen, Genentech, GSK, Baxter, Abgenix, Abcye, Sanofi, Novartis, Lilly and Shire), under the supervision of Executive Director Fu Daotian.

We estimate that if all the monoclonal antibodies can be launched successfully in the market, their peak sales potential should be around Rmb10bn, almost doubling the current scale of operation and likely enjoying 30 percentage points more than current gross margin. We budget around Rmb0.5bn total R&D expenditure to achieve that goal.

Fig 4 Pipeline of key biological products

Target	Product	Application for clinical studies	Approval of clinical studies	Phase I	Phase II	Phase III	Company target application	MQ estimated product launch
TNF alpha	Rh chorionic gonadotropin (重组人绒促性素)	2015	2016	P1 completed 2017		Ongoing 2018	2018	2021
	Adalimumab (阿达木单抗)	2016	2013	P1a completed 2014 P1b/2a completed 2015	Approved 2016 Ongoing 2017/18		2020	2021
CD20	Rituximab (利妥昔单抗)	2015	2016	Ongoing 2017/18			2020	2022
HER2	Pertuzumab (帕妥珠单抗)	2015	2016	Ongoing 2017/18			2021	2022
PD1	PD-1 mAb (PD-1单抗)	2016	US 17 China 18	Completed US 2018 Ongoing China 2018			2019	2020
RANKL	Denosumab (狄诺塞单抗)	2017	2018	Ongoing 2018			2022	2023
IL6R	Tocilizumab (托珠单抗)	China 18 US pending 18	2018				2021	2022

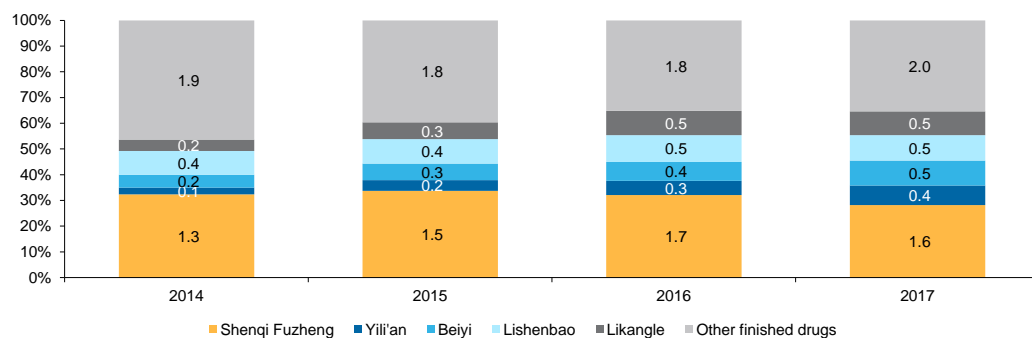
Source: Company data, Insight and Macquarie Research, November 2018

Valuation call

In terms of fundamentals, earnings growth of 30% should be easily achieved for 2018 as gastrointestinal drugs and fertility drugs offset weakness of Shenqi Fuzheng. The momentum should carry on into 2019 with 20% growth as western medicine Yilian and Beiyi earnings increase to cover up slippage of the Chinese drugs, potentially with higher gross margin and lower operating costs. However, for investors, a further decline of Shenqi Fuzheng should remain an overhang on sentiment as the severity and duration of decline are uncertain, even to the management.

We are also more conservative than management in the timeline of the launch of new products, in view of a lack of expertise in this field. Thus, there seems to be a lack of stock catalysts over the next 6 months apart from the clinical progress (not production approval) of drug candidates under development. The biggest proposition is the inexpensive valuation and intact earnings growth.

Fig 5 Sales and weight change of key drugs (Rmb bn)



Source: Company data, Macquarie Research, November 2018

Valuation, recommendation, risks

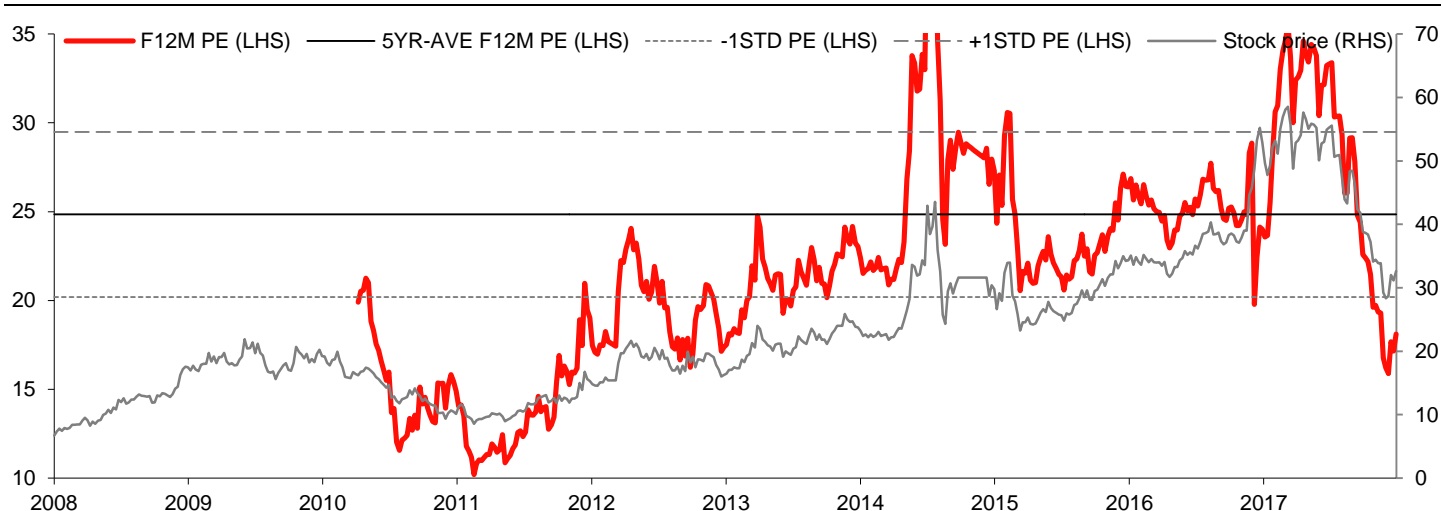
We base our target price on 2019E PE multiples, but we differ from our peers in providing 1) free cash flow analysis on each product and business, 2) a breakdown of revenue and earnings into individual products or subsidiaries and associates, with respective margin/SGA/tax assumptions, plus 3) major products under development, as far as into the pre-clinical stage if meaningful, associated with estimated probability of each event, R&D of each stage, and sales trajectory.

The discounted free cash flows will result in a gross asset value, which, after adding the net cash (or minus net debt) and working capital, will become net asset value (NAV). Currently, we use end-2019 to calculate our NAV estimates. NAV estimates are important in two important aspects:

- evaluating the present value of projects under development, which may not be able to contribute to earnings in the next three years;
- considering the impact on balance sheet after acquisitions and disposals, which may not be captured when just using a PE multiple to value a company.

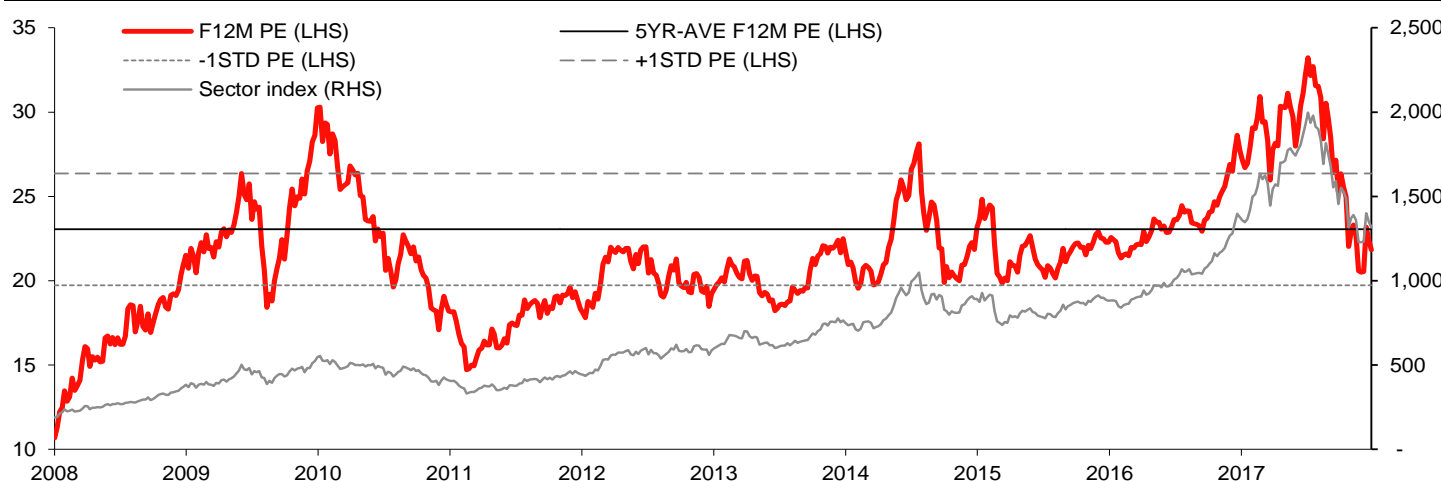
We apply a 25x PE on 2019E EPS of diagnostic, GI and antibiotic drugs, and 20x on hormones, TCM, API & others to arrive at our target price of Rmb40.72, implying a 20.5% TSR. We believe the multiple is justified in view of the strong earnings growth (31% in 2018E and 20% in 2019E), versus peers trading at 27.9x (12% growth in 2019E). LIVA currently trades at an 22.9x 12-month forward PE, versus historically at 24.8x.

Fig 6 LIVA (000513-CH) Historical PE multiple, average PE and stock price (Rmb)



Source: Factset, Macquarie Research, November 2018, priced as of 22 November 2018

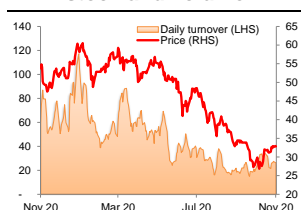
Fig 7 Sector (Pharma) Historical PE multiple, average PE and sector index



Source: Factset, Macquarie Research, November 2018, priced as of 22 November 2018

We estimate NAV of Rmb22.60, using a discount rate of 12.74%. Cost of equity is calculated using a risk-free rate of 3.5% and risk-free premium of 7%, which are the same across all healthcare companies under coverage. We assign a beta of 1.32 versus MSCI China-A, as compared to the latest 2-year weekly beta of 0.81 versus MSCI China-A (0.91 if versus Hang Seng Index).

LIVA stock and volume



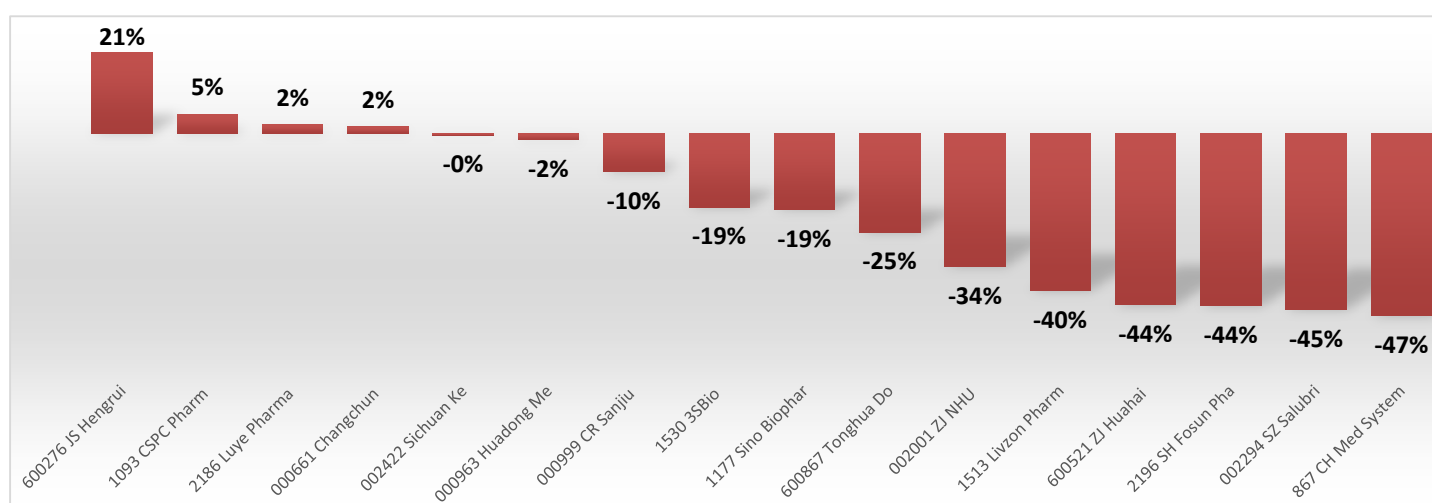
Source: FactSet, Macquarie Research, November 2018 (Rmb)

Our NAV can be broken down into Rmb1.60/share from TCM, Rmb1.59 from API, Rmb5.05 from GI, Rmb2.17 from antibiotics, Rmb0.86 from hormones, Rmb0.24 from diagnostics, Rmb-1.56 from other westerns, Rmb0.12 from others and Rmb12.52 from working capital.

We project 5 years of total R&D expenditure of Rmb4.1bn. This is compared to about Rmb0.3bn spent during 1H18, or 7.3% of revenue. Such an expenditure is supposed to go into preclinical and clinical drug development as well as bioequivalence studies for generic drugs. Not all of their revenue impact down the road has not been fully captured in our model.

YTD, LIVA is one of the worst performers among the pharmaceutical manufacturers, down 59%, versus the sector median of -19%. We believe the market correction should be more than enough, and it is a good opportunity for bottom fishing.

Fig 8 YTD stock performance among peers



Source: Factset, Macquarie Research, November 2018, priced as of 22 November 2018

Fig 9 Comparables (Price in trading currency)

Ticker	Company	Mkt. Cap. (US\$ bn)	Listed Curr.			P/E			EV/EBITDA			P/BV	Yield	2018/19 growth	
			TP	Price	Rating	2018F	2019F	2020F	2018F	2019F	2020F			2018F	2018F
600276-CN	Hengrui	34.0	NR	63.32	NR	58.1	45.8	36.4	50.0			12.2	0.2%	25.6%	27.0%
1093-HK	CSPC	13.2	25.39	16.00	OP	27.4	20.1	16.1	18.0	13.6	11.1	5.5	1.2%	26.1%	36.6%
1177-HK	Sino Biopharm	12.0	10.22	7.07	OP	31.8	26.2	21.2	15.2	12.1	9.9	4.1	0.7%	28.7%	23.3%
2196-HK	Fosun Pharm-H	10.4	NR	27.55	NR	22.7	18.2	15.8	16.7	13.5	11.9	2.2	1.6%	18.1%	24.7%
000963-CN	Huadong Med	7.4	NR	34.54	NR	22.8	18.2	14.8	17.5	14.0	11.7	5.1	1.7%	12.9%	25.3%
002422-CN	Sichuan Kelun P	5.1	NR	24.59	NR	28.6	22.7	18.4	12.5	10.4	9.3	2.8	1.2%	17.4%	26.3%
002001-CN	ZJ NHU	4.6	NR	16.23	NR	9.3	13.0	14.0	7.5	8.1	7.6	2.2	5.8%	19.6%	-28.5%
000661-CN	Changchun High	4.6	NR	187.95	NR	32.6	24.8	19.0	20.7	15.4	11.8	6.1	0.6%	28.0%	
600867-CN	Tonghua Dongbao	4.2	NR	14.44	NR	29.0	25.2	19.8	22.6	18.2	14.6	5.8	1.3%	18.9%	15.2%
1530-HK	3SBio	4.0	NR	12.34	NR	24.6	19.8	15.6	20.6	16.7	14.0	3.3	0.0%	21.9%	24.6%
002294-CN	Salubris	3.7	40.06	25.22	OP	16.1	12.9	10.8	12.6	10.1	8.5	3.8	3.6%	21.9%	25.1%
000999-CN	CR Sanjiu	3.5	NR	24.72	NR	16.9	15.2	13.7	12.0	10.6	9.6	2.2	1.3%	13.1%	11.5%
1513-HK	Livzon Pharm-H	3.2	37.61	29.05	OP	17.2	14.4	13.5	7.8	6.9	6.3	1.7	1.7%	14.5%	19.9%
867-HK	CMS	3.1	NR	9.52	NR	10.7	9.3	8.3	7.4	6.6	6.1	2.4	3.5%	9.7%	15.2%
2186-HK	Luye	2.6	8.76	6.46	OP	15.4	13.4	12.2	10.4	9.0	8.3	2.4	1.0%	21.0%	15.8%
600521-CN	ZJ Huahai Pharm	2.5	NR	14.03	NR	76.8	150.0	49.0	20.2	15.0	15.9	3.3	1.1%	19.7%	-48.8%
Median						23.7	19.0	15.7	17.1	13.5	11.7	3.3	1.3%	19%	16%
Average						27.0	27.9	18.6	18.1	13.0	11.3	4.2	1.7%	18%	12%

OP: Outperform, N: Neutral, UP: Underperform, NR: Non-rated; Rated forecast by Macquarie research and non-rated forecast by FactSet Consensus.

Source: FactSet, Macquarie Research, November 2018, priced as of 22 November 2018

Key risks

The decline of Shenqi Fuzheng is not new anymore, but it seems that nobody is sure how quickly and how much more it can decline. The other uncertainty is whether gross margin may be affected and whether price cuts will be needed to slow the decline. Anti-viral TCM performed ok this year, but that might be helped by the more-severe-than-normal cold and flu season earlier this year. 2019 growth may be lacklustre due to a high base in 2018. The other product suffering decline is the mouse nerve growth factor or Likangle, which is seeing competition from 3 other drugs and has the smallest market share. The other competitors are Jinlujie by Hiteck (300683-CN, not rated), Enjingfu by Sinobioway (002581-CN, not rated) and Sutaisheng by Staidson (300204-CN, not rated).

We have not built in a lot of contribution from the monoclonal antibodies under development, but we expect them to generate total revenue of Rmb10bn in the following 5 years if they are all successfully launched. This may be too optimistic in view of a lack of experience in securing biological drug approval or an established sales and marketing team to promote such products.

Livzon is 44.8%-owned by Joicare but shares the same Chairman, Zhu Baogou, who has a background in marketing health supplement in his early days of career. His experience in sales and marketing is very valuable in directing the positioning and promotion of Livzon's products, but he may need external help, including M&A, to strengthen the company's expertise in R&D and going through regulatory hurdles.

Product analysis

The company has been focused on oncology. Their best-selling drug, Shenqi Fuzheng, was launched back in 1999 and accounted for 19% of their total revenue in 2017. Another field the company has entered is the CNS field, in which they launched Likangle in 2010, accounting for 6% of the revenue. What should be noted is that Shenqi Fuzheng and Likangle are either TCM injection or adjuvant drugs, which are facing fierce pricing and prescription pressure.

Another treatment field the company has been focused on is the supportive reproductive field. They launched Lishenbao in 2005, having acquired almost 100% of the urofollitropin market share as of today, accounting for 7% of the revenue in 2017. Another drug to become blockbuster in three years is Beiyi, leuprorelin microspheres, which would record a revenue of Rmb0.9bn in 2019, exceeding the sales of Shenqi Fuzheng.

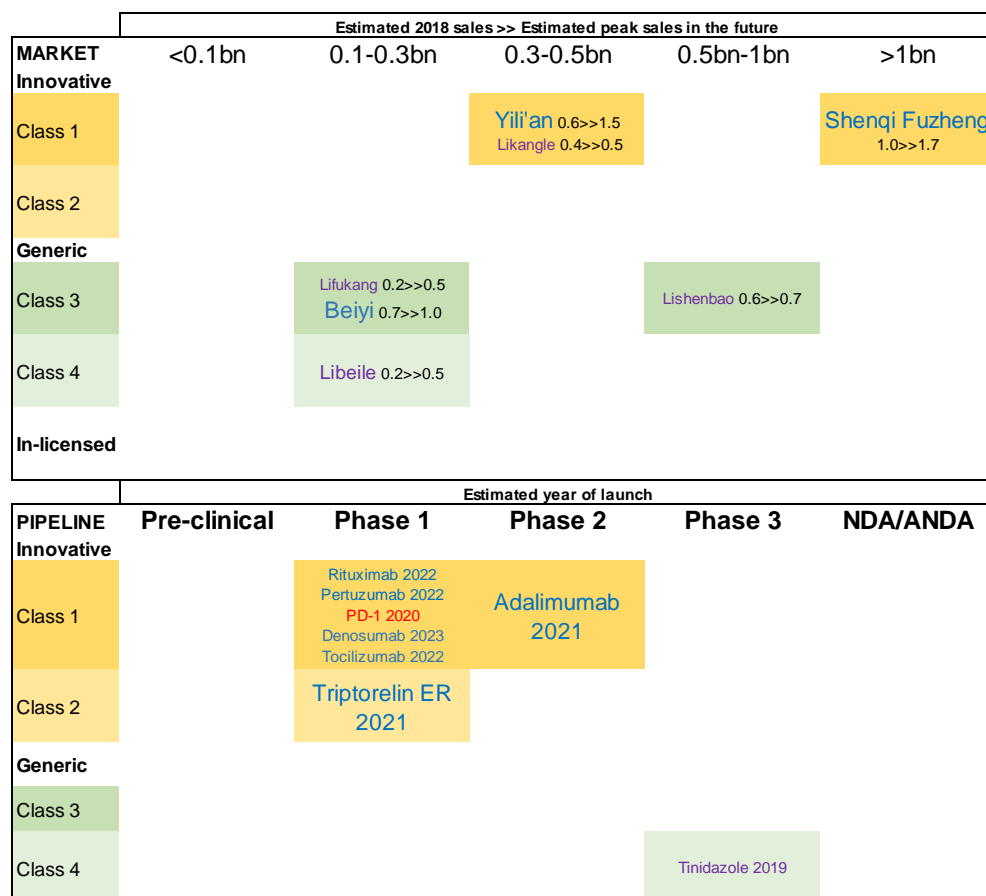
The company has been shifting focus onto the gastrointestinal field, and this field accounted for 12% of the revenue in 2017. Based on our estimates, this field will keep growing fast and become the biggest revenue contributor by 2020, taking up 16% of the revenue. Yili'an, with the chemical ilaprazole, is one of the few Class 1.1 innovative –prazole drugs developed by domestic pharma, and should exceed the sales of Shenqi Fuzheng by 2020, with a 37% yoy growth.

Pipelines analysis – biologics to be the next breakthrough

Specialized in the extended release drugs, Livzon has blockbuster drug candidates in their pipeline in the reproductive treatment field. Triptorelin microspheres, which is expected to launch in 2021, with estimated peak sales of Rmb1bn, would have a synergy with Beiyi.

Biologics are the next breakthrough. They have eight mab drugs under development, covering almost all of the hot targets. According to management, most of these drugs are coming out in 2020, while we are more conservative and expect the earliest would launch in 2021. We believe two biologics are worth special attention, the Perjeta biosimilar and the IL-6 mab. Both are to launch in 2022 with peak sales of Rmb1.5bn, according to our estimate.

Fig 10 Major market and pipeline drugs with estimated launch date and peak sales (Rmb)



Source: Company data, Macquarie Research, November 2018

Fig 11 Shenqi Fuzheng

- Sales trend: Shenqi Fuzheng recorded sales of Rmb1.6bn in 2017, accounting for 19% of total revenue, with a CAGR of 5.3% in 2013-2017. Due to the intensified pressure on use of adjuvant TCM injection drugs, we estimate it will grow at low teens and reach peak sales of c. Rmb2.5bn.
- Market size: there are more than 3m new oncology cases in China in 2017 and the drug market size for oncology is over Rmb100bn, among which TCM injection accounts for c. 16%, around Rmb16bn in 2017.
- Growth potential: with intensified pressure on its use, Shenqi Fuzheng is on NRDL and the company has been collecting more clinical proof and is expanding its sales force into more Class 2 hospitals.

Source: Company data, Macquarie Research, November 2018

Fig 13 Shenqi Fuzheng

- Mechanism of action (MOA): active ingredient of Shenqi Fuzheng is extract from two TCM herbs, Codonopsis pilosula (Dang Shen) and Astragalus (Huang Qi), and according to the company could boost the immune system of patients, protect the organs and strengthen the efficacy of other treatment.
- History: Shenqi Fuzheng was brought to the market in 1999 as a TCM injection drug for adjuvant treatment of oncology and some heart/lung-related diseases.
- Potential risk: there has always been arguments about the efficacy and safety of adjuvant TCM injections. With the more intensified control on the drug sales ratio in public hospitals and insurance reimbursement reform, sales of Shenqi Fuzheng should be affected a lot.

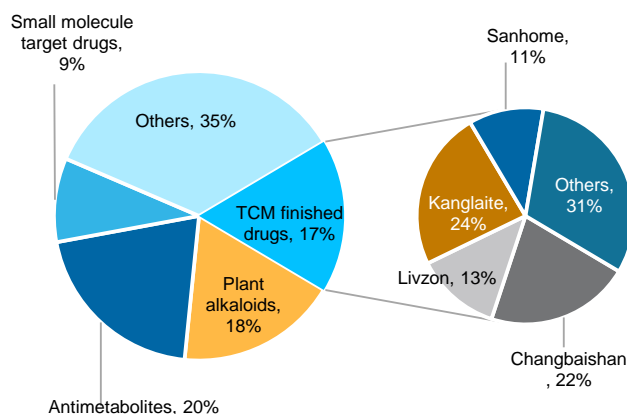
Source: Company data, Macquarie Research, November 2018

Fig 15 Lishenbao

- Sales trend: Lishenbao recorded sales of Rmb550m in 2017, accounting for 6.5% of the total revenue, with a growth CAGR of 14% in 2014-2017. In the future, we believe it will grow moderately and achieve peak sales of Rmb800m.
- Market size: according to government data, there are c. 4m people who need ovulation stimulants mainly used for reproductive purposes, and we estimate the current market size of related drugs is c. Rmb10bn.
- Growth potential: there are three urofollitropin drugs in the market and no visible potential threat. There are two major growth drivers of this market: baby boom in 1985-1990 are entering their reproductive stage; China's complete restrictions lift of having babies.

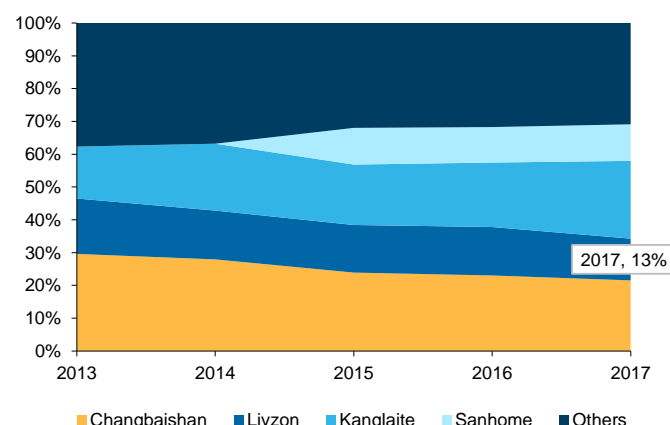
Source: Company data, Macquarie Research, November 2018

Fig 12 Breakdown of TCM adjuvant oncology drugs in 2017



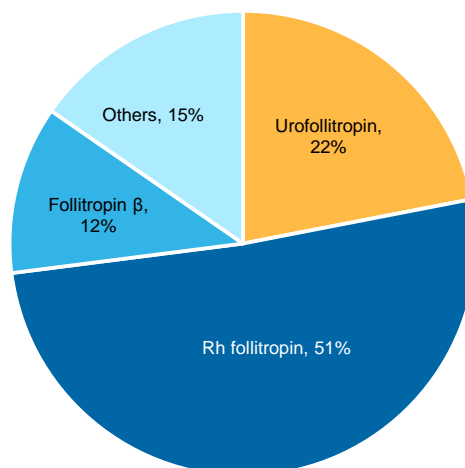
Source: Company data, Macquarie Research, November 2018

Fig 14 Market share of Livzon within TCM oncology drugs



Source: PDB, Macquarie Research, November 2018

Fig 16 Market breakdown of fertilization drugs in 2017



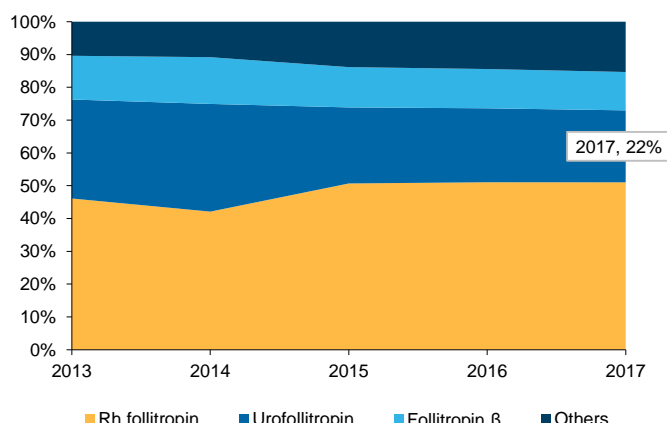
Source: Company data, Macquarie Research, November 2018

Fig 17 Lishenbao

- MOA: urofollitropin is a purified form of follicle-stimulating hormone (FSH) extracted from human urine and then purified. It is often combined with other gonadotropin, like human chorionic gonadotropin (hCG), used to assist in ovulation and fertility.
- History: Lishenbao launched in 2005 as adjuvant reproductive drugs. There are two forms of follitropin, urofollitropin and recombinant human follitropin. After another major player, IBSA, exited the urofollitropin market in 2015, Lishenbao acquired almost 100% market share.
- Potential risk: urofollitropin market has been consolidated, and it might face pressure from recombinant human follitropin drugs.

Source: Company data, Macquarie Research, November 2018

Fig 18 Market share change of urofollitropin



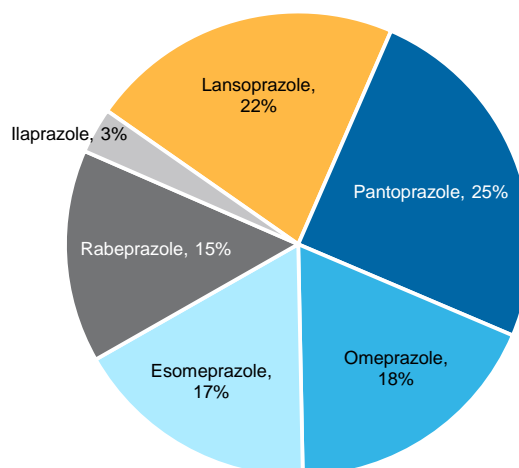
Source: PDB, Macquarie Research, November 2018

Fig 19 Yili'an

- Sales trend: Yili'an recorded sales of Rmb428m in 2017, accounting for 5.1% of total revenue, with a growth CAGR of 59% in 2014-2017. In the future, we believe combined with its injection form, Yili'an will keep growing fast and reach peak sales of Rmb1bn.
- Market size: there are around 100m people suffering from peptic ulcer in China, and we estimate the drug market size is around Rmb15bn, among which 90% are in the class of proton-pump inhibitors (PPIs).
- Growth potential: ilaprazole is a Class 1.1 innovative drug and has been listed on 217 NRDL; major growth should come from further penetration into market and market share acquisitions from MNCs.

Source: Company data, Macquarie Research, November 2018

Fig 20 Market breakdown of PPI drugs in 2017



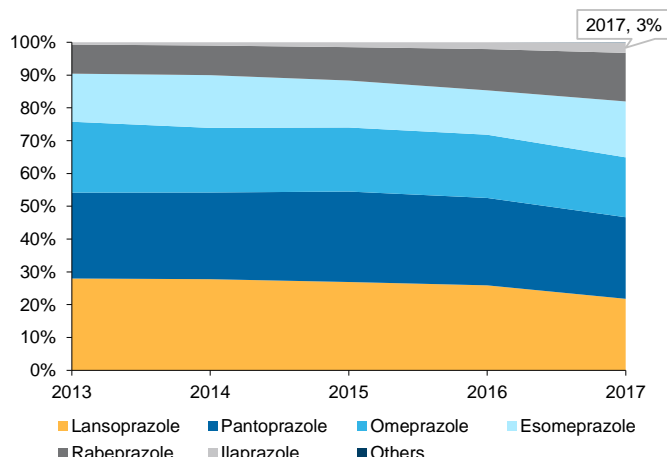
Source: Company data, Macquarie Research, November 2018

Fig 21 Yili'an

- MOA: active ingredient of Yili'an is ilaprazole, a new generation of PPI. PPIs work by irreversibly blocking the H⁺/K⁺ ATPase, AKA, the gastric proton pump, of the gastric parietal cells. Targeting this last step in acid production, they could reduce the secretion by 99%.
- History: Yili'an launched in 2007 for treatment of a duodenal ulcer. Its injection form launched in 2017. Based on clinical data, it works better than omeprazole and is as good as esomeprazole.
- Potential risk: there are six PPI drugs currently available in China's market, and the competition is fierce and becoming even more intense in the future. Besides that, its clinical trial results in the US should also affect its reputation in China.

Source: Company data, Macquarie Research, November 2018

Fig 22 Market share change of Yili'an



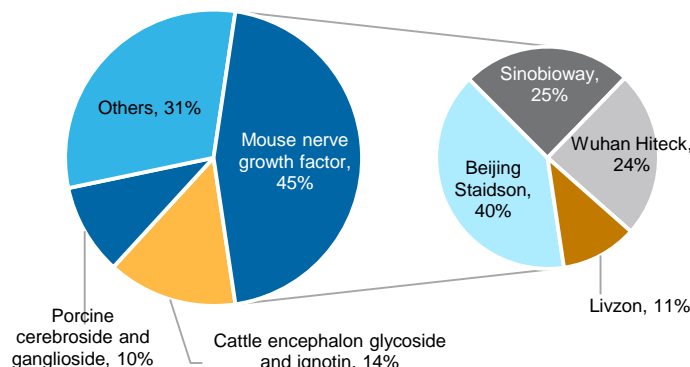
Source: PDB, Macquarie Research, November 2018

Fig 23 Likangle

- Sales trend: Likangle recorded sales of Rmb517m in 2017, accounting for 6.2% of total revenue, with a growth CAGR of 42% in 2014-2017. We believe the sales of Likangle will decrease moderately to dramatically due to its adjuvant drug status and as is its weight within Livzon’s drug portfolio.
- Market size: the current market size of the mouse nerve growth factor (mNGF) is around Rmb3bn, and it has been growing at a CAGR of 49% in the last five years. We believe this market could reach Rmb10bn in the future.
- Growth potential: there are four mNGF drugs in the market and another two are under clinical trials. Major growth should come from strong growth of the whole market and its indication expansion.

Source: Company data, Macquarie Research, November 2018

Fig 24 Breakdown of adjuvant CNS drugs in 2017



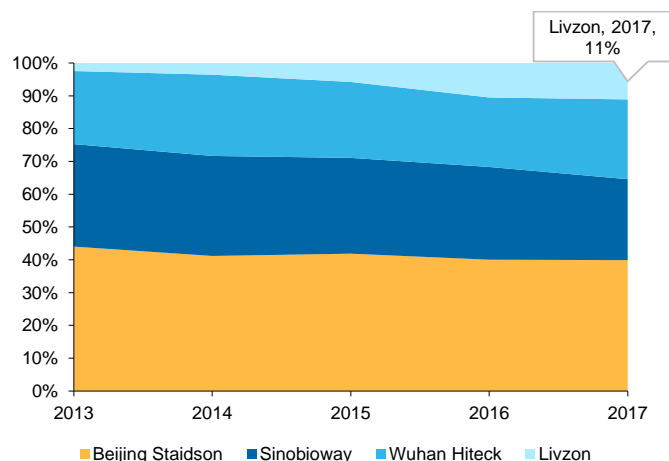
Source: Company data, Macquarie Research, November 2018

Fig 25 Likangle

- MOA: NGF is a neurotrophic factor and neuropeptide involved in the regulation of certain neurons. They could bind to two receptors on the cell surface of neurons, TrkA and p75NTR, activate related tyrosine kinases and pathways and further affect the growth, proliferation and survival of target neurons.
- History: Likangle launched in 2010 and is the fourth drug in the class, mainly used for recovery of damaged neuro cells. It followed the other three products developed by Beijing Staidson, Sinobioway and Wuhan Haite.
- Potential risk: there is more intensified pressure on use of adjuvant drugs; no same-class drug has been approved by the US FDA or EMA; there are more restrictions on the 2017 NRDL.

Source: Company data, Macquarie Research, November 2018

Fig 26 Market share change of Likangle



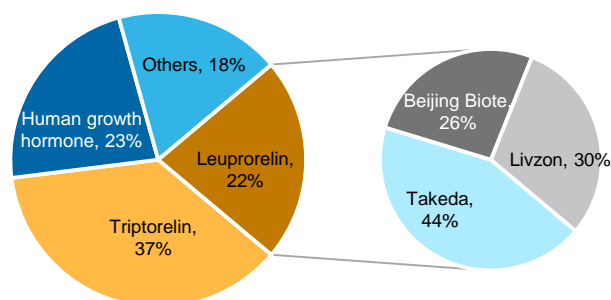
Source: PDB, Macquarie Research, November 2018

Fig 27 Beiyl

- Sales trend: Beiyl recorded sales of Rmb542m in 2017, accounting for 6.5% of total revenue, with a growth CAGR of 39% in 2014-2017. In the future, we believe it will keep growing fast and achieve peak sales of Rmb1bn.
- Market size: the main indication of Beiyl is endometriosis, with a prevalence rate of 10% and it is the cause of 20-30% of infertility issues within women. Based on sample hospital sales data, we estimate the current market size for relin-class drugs is c. Rmb5bn.
- Growth potential: there are three leuprorelin drugs in the market and another 11 are under clinical trials. Future growth should mainly come from substitution of drugs of MNC and an increase of the treatment rate.

Source: Company data, Macquarie Research, November 2018

Fig 28 Market breakdown of hypothalamic hormone in 2017



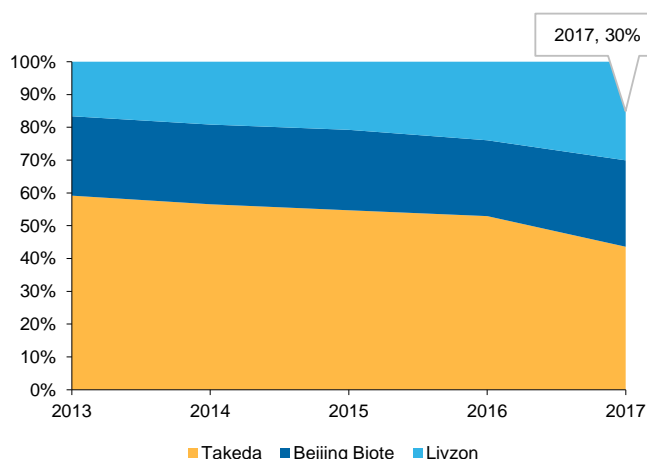
Source: Company data, Macquarie Research, November 2018

Fig 29 Beiyi

- MOA: active ingredient of Beiyi is leuporelin, belonging to the gonadotropin-releasing hormone (GnRH) analogue family of drugs. It acts as an agonist at GnRH receptors and after continuous stimulation, the receptors will become desensitised and then downregulate the gonadotropin secretion.
- History: Beiyi launched in 2009 for treatment of endometriosis, premenopausal breast cancer, precocious puberty and etc., in the same year with the first-to-market generic developed by Beijing Biote, both following the innovative drug developed by Takeda.
- Potential risk: there is competition from the same class of drugs including goserelin and triptorelin, and also competition from other leuporelin applicant.

Source: Company data, Macquarie Research, November 2018

Fig 30 Market share change of leuporelin



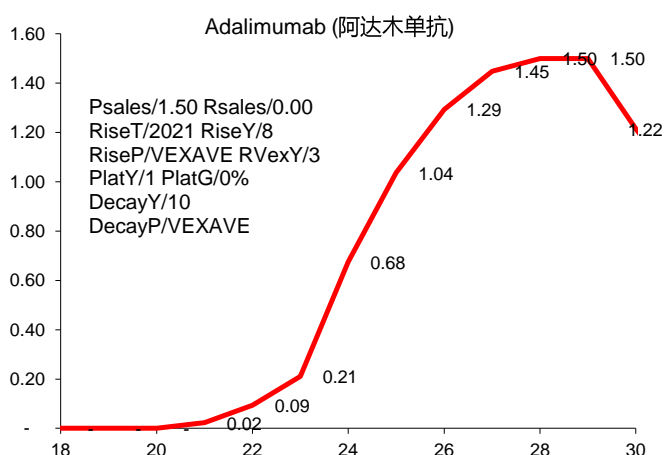
Source: Company data, Macquarie Research, November 2018

Fig 31 TNF-a mab

- Sales potential: the innovative drug of adalimumab is Humira developed by Abbvie, and it recorded sales of US\$18bn globally in 2017. We estimate the potential market size of mab drugs targeting TNF α is around Rmb10bn in China. Depending on the time to launch, first-to-market biosimilar could achieve peak sales of Rmb1.5bn.
- MOA: adalimumab is a mab drug binding to tumour necrosis factor-alpha (TNF α), a cytokine mainly binding to TNF α receptors and leading to inflammatory response of autoimmune diseases.
- Competitive landscape: there is no Humira biosimilar in the market, four are under the NDA review and another 30 are in clinical trials.

Source: Company data, Macquarie Research, November 2018

Fig 32 Sales forecast simulation of TNF-a mab (Rmb bn)



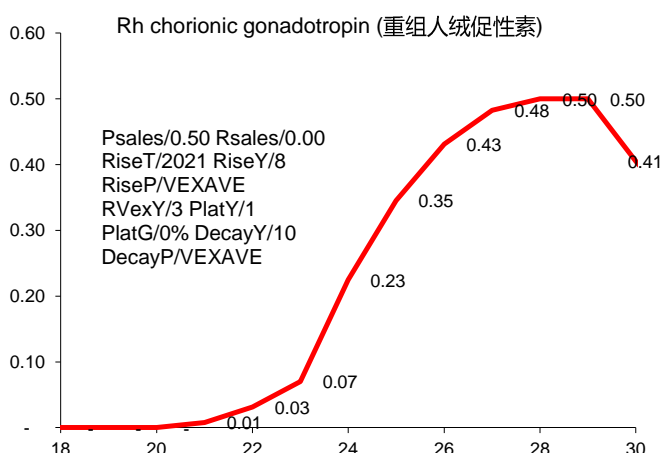
Source: Macquarie Research, November 2018

Fig 33 rh-chorionic gonadotropin (rhCG)

- Sales potential: the innovative drug of rhCG is Ovidrel developed by EMD Serono and it recorded sales of US\$695m globally in 2011. There are c. 4m females who need ovulation stimulants in China, and we estimate the current market size of related drugs is c. Rmb10bn. As the potential first-to-market generic, we believe it could achieve peak sales of Rmb0.5bn.
- MOA: HCG is a hormone produced by the placenta, and it interacts with the luteinizing hormone chorionic gonadotropin (LHCG) receptor of the ovary and introduces ovulation. RhCG is the recombinant version.
- Competitive landscape: currently, there is one rhCG drug in the China market which is the innovator drug, and another one developed by Livzon is in clinical trial.

Source: Company data, Macquarie Research, November 2018

Fig 34 Sales forecast simulation of rhCG (Rmb bn)



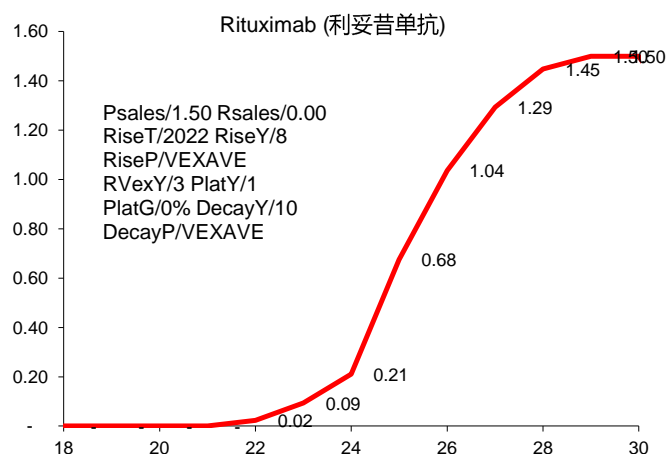
Source: Macquarie Research, November 2018

Fig 35 anti-CD20 mab

- Sales potential: the innovative drug of rituximab is Rituxan developed by Genentech (subsidiary of Roche), and it recorded sales of US\$7.1bn globally in 2017. We estimate the potential market size of mab drugs targeting CD20 is around Rmb6bn in China. Depending on the time to launch, we believe first-to-market biosimilar could achieve a peak sales of Rmb1.5bn.
- MOA: rituximab is a mab drug against the protein CD20, which is primarily expressed on the surface of B cells. When binding to B cells, it will modify the protein structure and let natural killer cells eliminate the B cells.
- Competitive landscape: there is no Rituxan biosimilar in the market, two are under the NDA review and another 15 are in clinical trials.

Source: Company data, Macquarie Research, November 2018

Fig 36 Sales forecast simulation of anti-CD20 mab (Rmb bn)



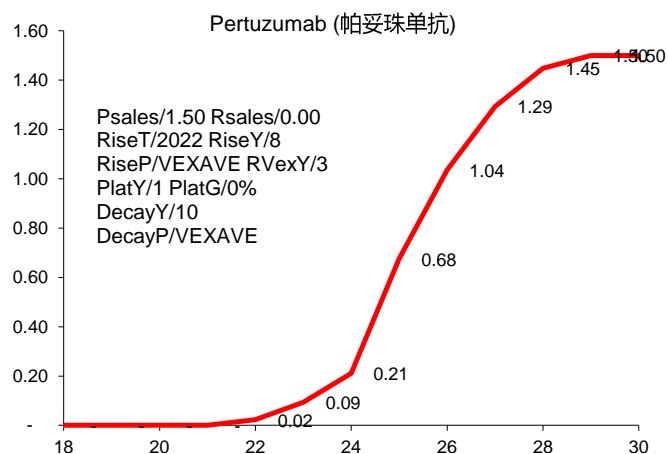
Source: Macquarie Research, November 2018

Fig 37 anti-HER2 mab

- Sales potential: the innovative drug of pertuzumab is Perjeta developed by Genentech (subsidiary of Roche), and it recorded a sales of US\$2.2bn globally in 2017. We estimate the potential market size of mab drugs targeting HER2 is around Rmb5bn in China. Depending on the time to launch, we believe first-to-market biosimilar could achieve a peak sales of Rmb2bn.
- MOA: pertuzumab is a mab drug targeting HER2 receptor. HER2 belongs to the EGF pathway, when it is overexpressed, cells will become overly active in proliferation and become cancer cells.
- Competitive landscape: besides the innovator drug, there is no Perjeta biosimilar in the China market, and two are in clinical trials.

Source: Company data, Macquarie Research, November 2018

Fig 38 Sales forecast simulation of anti-HER2 mab (Rmb bn)



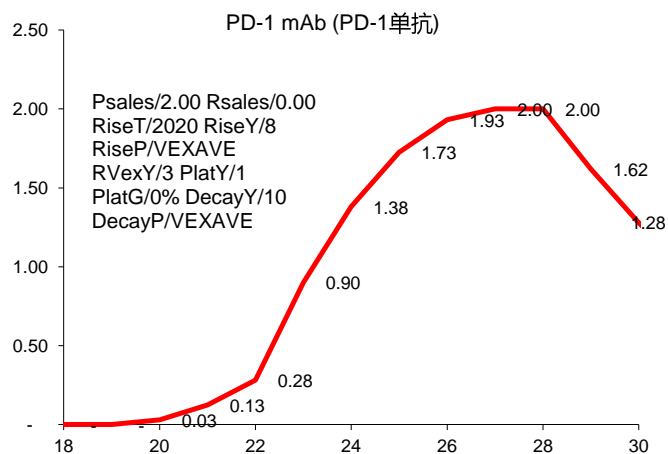
Source: Macquarie Research, November 2018

Fig 39 PD-1

- Sales potential: the comparable drug is nivolumab, developed by BMS and marketed under the name Opdivo. It launched in 2015 and in 2017 recorded sales of US\$5.0bn. We estimate the potential market size for PD-1/PD-L1 drugs is over Rmb100bn in China and depending on the launch schedule, we believe first-to-market biosimilar could achieve peak sales of Rmb2bn.
- MOA: Opdivo is a mab drug targeting programmed cell death protein 1 expressed on the surface of T cells, where its ligand PD-L1 frequently overexpressed in tumour cells could bind to and thus inhibit T cell activity.
- Competitive landscape: there are two PD-1 drugs approved in the China market, 14 are under the NDA review and another 11 are in clinical trials.

Source: Company data, Macquarie Research, November 2018

Fig 40 Sales forecast simulation of PD-1 mab (Rmb bn)



Source: Macquarie Research, November 2018

Financial analysis

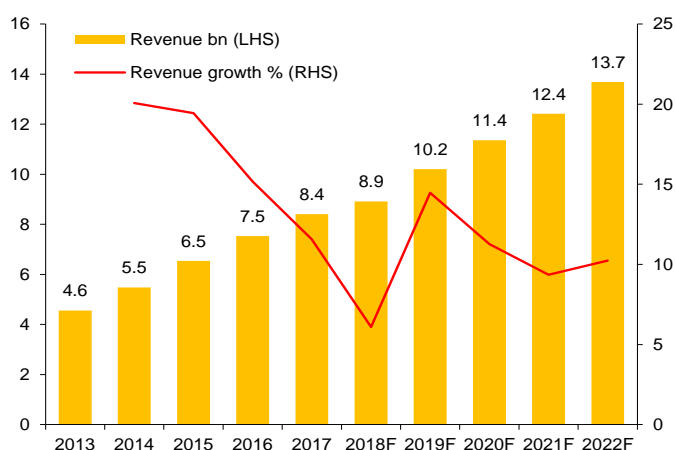
Pressure is continuous for TCM and adjuvant drugs, while new drugs in gastrointestinal and other treatment fields are ramping up fast

Gross profit margin is expected to improve due to the ramp of high margin drugs, as well as the R&D expense

Growth of revenue has been slowing down in the last three years mainly due to pricing pressure and regulatory control on TCM finished drugs and adjuvant drugs. This has affected Shenqi Fuzheng and Lishenbao, two of the most important revenue contributors. Revenue growth should be 6% for 2018, while core earnings should rise 30%, thanks to good SG&A cost control. The first 9 months' earnings growth was 17%. Revenue should grow faster in the next three years with new drugs ramping up sales, especially in the gastrointestinal field and updated hormone drugs using extended-release formulations. Beyond 2020, we expect more contributions from biologics which has been the strategic focus recently.

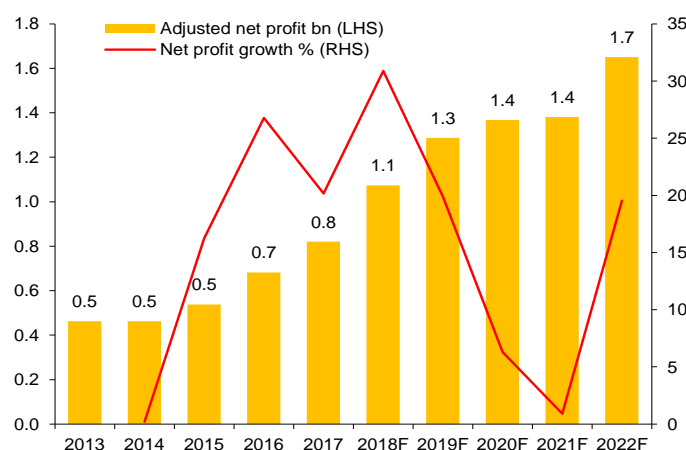
Gross profit margin used to be lower than the industry average, but it has improved by 10 pts since 2010. This was mainly due to a shift of focus from the low-margin API business and hormonal drugs to the high-margin gastrointestinal drugs and we expect this trend will continue. SG&A is under good control, partly due to the decreasing weight for Shenqi Fuzheng, which has a high SG&A ratio. R&D costs have been gradually increasing, in line with the industry average and we believe it will continue to grow as more biologics come to the late development stage.

Fig 41 Revenue and growth of 000513-CH (Rmb bn)



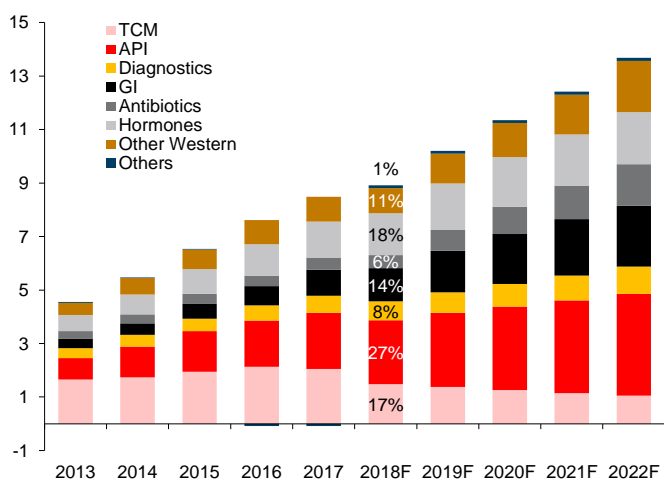
Source: Factset, Macquarie Research, November 2018

Fig 42 Net profit and growth of 000513-CH (Rmb bn)



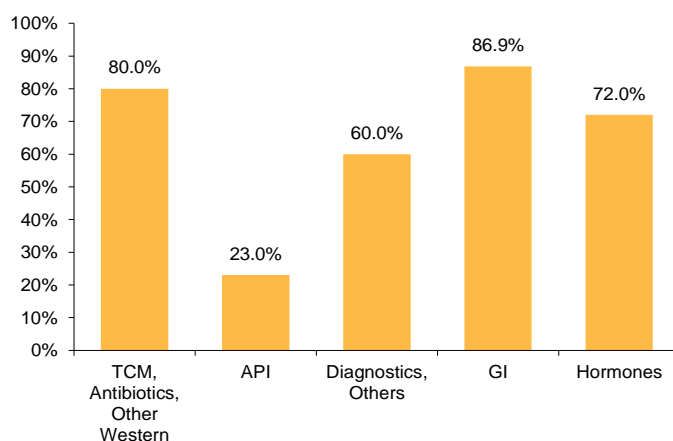
Source: Factset, Macquarie Research, November 2018

Fig 43 Revenue breakdown of 000513-CH (Rmb bn)



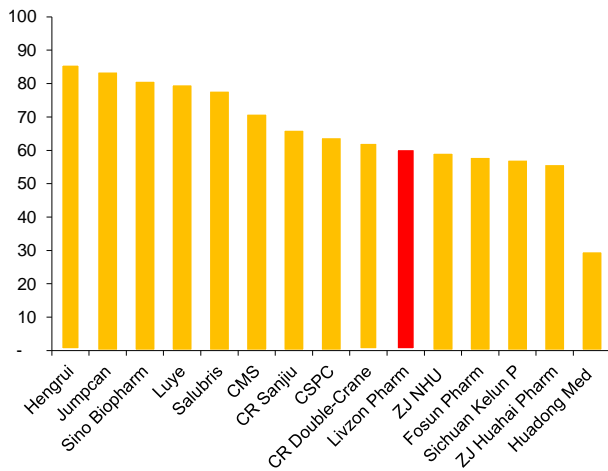
Source: Factset, Macquarie Research, November 2018

Fig 44 Gross margin breakdown 2018F of 000513-CH



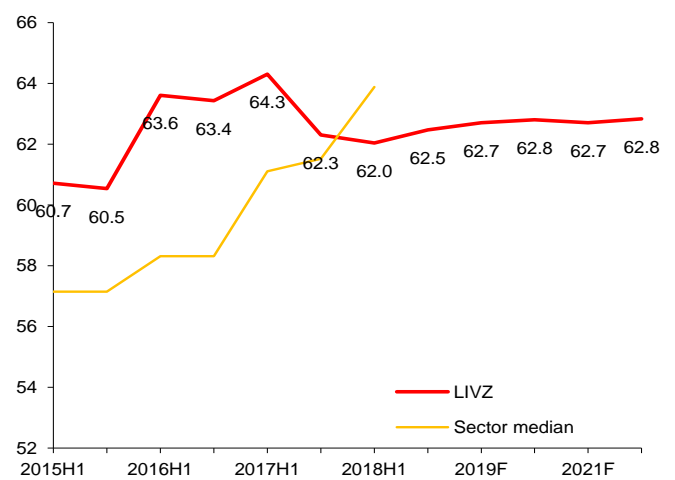
Source: Factset, Macquarie Research, November 2018

Fig 45 Gross margin of 000513-CH vs peers – 1H18 (%)



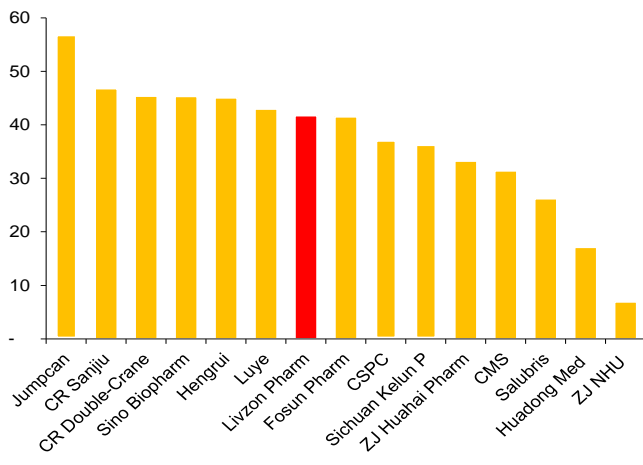
Source: Factset, Macquarie Research, November 2018

Fig 46 Gross margin trend of 000513-CH (%)



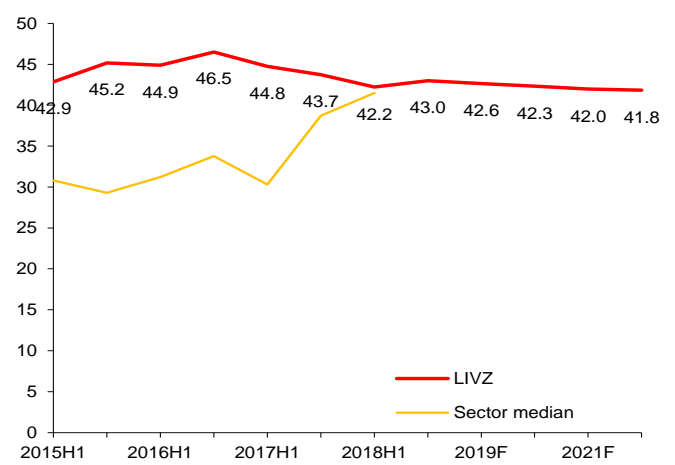
Source: Factset, Macquarie Research, November 2018

Fig 47 SGA ratio of 000513-CH vs peers – 1H18 (%)



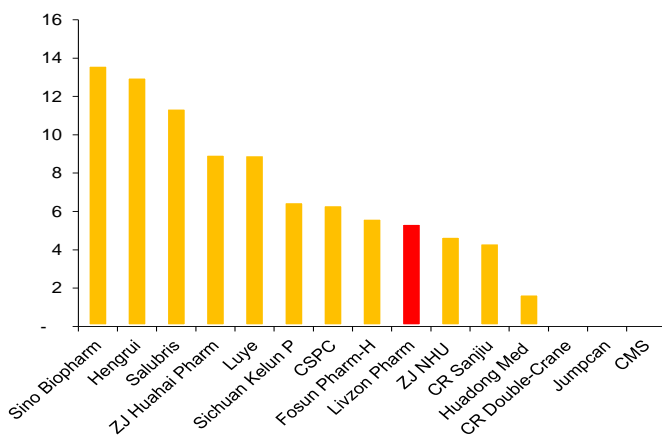
Source: Factset, Macquarie Research, November 2018

Fig 48 SGA ratio trend of 000513-CH (%)



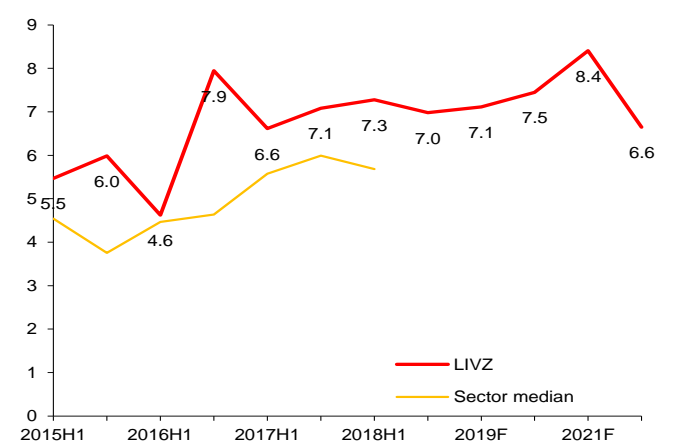
Source: Factset, Macquarie Research, November 2018

Fig 49 R&D ratio of 000513-CH vs peers – 1H18 (%)



Source: Company Data, Macquarie Research, November 2018

Fig 50 R&D ratio trend of 000513-CH (%)



Source: Company Data, Macquarie Research, November 2018

Balance sheet

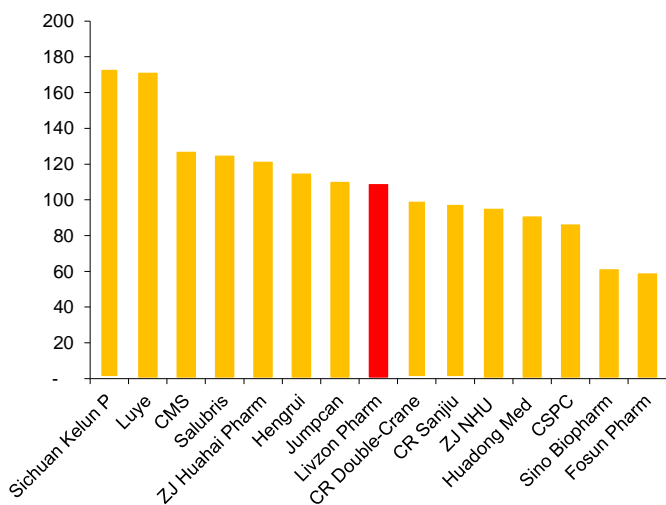
Inventory and receivable days are expected to stabilize

Disposal of subsidiary secures enough cash on balance sheet

Inventory days and receivable days of Livzon in 1H18 were 123 and 72, respectively. Both have been stable in the last couple of years, and were in line with the industry average. They should not change dramatically in the near term unless the macro and regulatory policy changes.

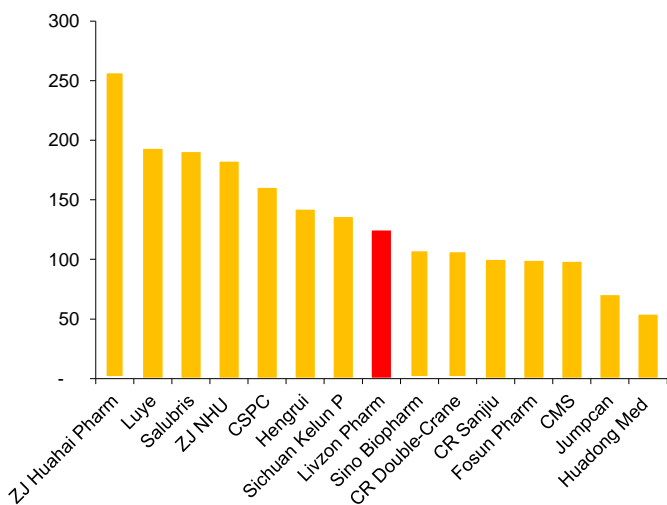
Operating cash flow has gradually increased to Rmb1bn after consideration change of working capital. It is more than enough to cover the investment cash outflow. In 2017, there is a cash inflow of Rmb4.3bn due to the disposal of 100% equity interest of one of its subsidiaries Weixing Shiye. We believe the windfall should satisfy the company's short-term funding needs. The total gearing ratio of the company is below 10%, which is pretty healthy and has further space to issue debt if needed.

Fig 51 Receivables days of 000513-CH vs peers – 1H18



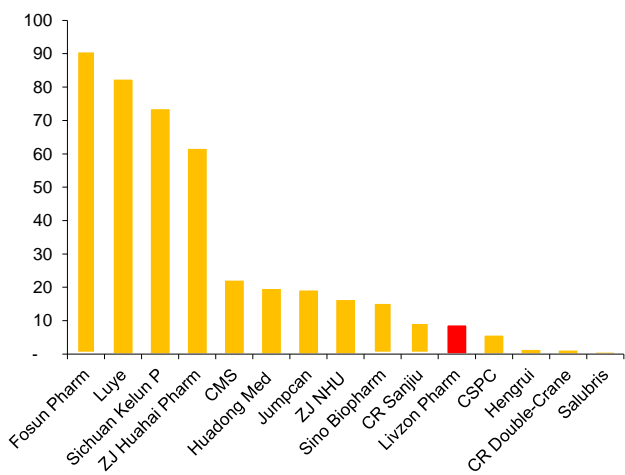
Source: Factset, Macquarie Research, November 2018

Fig 52 Inventories days trend of 000513-CH – 1H18



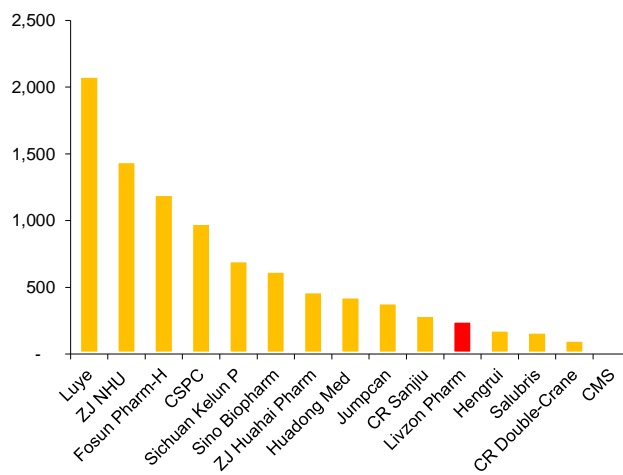
Source: Factset, Macquarie Research, November 2018

Fig 53 Total Gearing of 000513-CH vs peers – 1H18 (%)



Source: Factset, Macquarie Research, November 2018

Fig 54 Capex of 000513-CH vs peers – 1H18 (Rmb mn)



Source: Factset, Macquarie Research, November 2018

Fig 55 Income statement and balance sheet forecasts (Rmb bn)

INCOME STATEMENT	2013	2014	2015	2016	2017	2018F	2019F	2020F	2021F	2022F
Revenue	4.6	5.5	6.5	7.5	8.4	8.9	10.2	11.4	12.4	13.7
COGS	(1.7)	(2.1)	(2.6)	(2.7)	(3.1)	(3.3)	(3.8)	(4.2)	(4.6)	(5.1)
Gross profit	2.9	3.3	4.0	4.8	5.3	5.6	6.4	7.1	7.8	8.6
Gross margin	62.8%	60.9%	60.6%	63.5%	63.3%	62.5%	62.7%	62.8%	62.7%	62.8%
Selling, marketing & administrative	(2.1)	(2.4)	(2.9)	(3.4)	(3.7)	(3.8)	(4.4)	(4.8)	(5.2)	(5.7)
Research and development	(0.1)	(0.2)	(0.4)	(0.5)	(0.6)	(0.6)	(0.7)	(0.8)	(1.0)	(0.9)
Other operating income/expenses	(0.1)	(0.1)	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
Exceptional items	(0.0)	(0.0)	(0.1)	(0.0)	4.7	-	-	-	-	-
EBIT excluding exceptional	0.6	0.6	0.8	0.9	1.2	1.2	1.4	1.6	1.6	2.1
EBITDA excluding exceptional	0.7	0.8	1.1	1.3	1.5	1.6	1.8	1.9	2.0	2.4
Interest expenses	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Interest income	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
Share of results of associates	0.0	0.0	0.0	(0.0)	0.0	-	-	-	-	-
Other non-operating income/expenses	0.0	0.1	0.1	0.1	(0.2)	0.1	-	-	-	-
Profit before tax	0.6	0.7	0.8	1.0	5.7	1.5	1.6	1.7	1.8	2.2
Income tax	(0.1)	(0.1)	(0.1)	(0.2)	(1.2)	(0.2)	(0.2)	(0.3)	(0.3)	(0.3)
Profit before minority interests	0.5	0.6	0.7	0.8	4.5	1.2	1.3	1.5	1.5	1.9
Minority interests	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.2
Net profit	0.49	0.52	0.62	0.78	4.43	1.17	1.29	1.37	1.38	1.65
Dividends	0.15	0.03	0.20	0.21	1.11	0.32	0.39	0.41	0.41	0.50
Preferred distributions	-	-	-	-	-	-	-	-	-	-
Adjusted net profit	0.46	0.46	0.54	0.68	0.82	1.07	1.29	1.37	1.38	1.65
EPS (adjusted)	0.71	0.71	0.82	1.01	1.15	1.49	1.78	1.90	1.91	2.29
DPS	0.23	0.05	0.30	0.30	1.54	0.45	0.54	0.57	0.58	0.69
Special DPS	-	-	-	-	-	-	-	-	-	-
Average basic shares	0.65	0.65	0.65	0.67	0.71	0.72	0.72	0.72	0.72	0.72
Average fully-diluted shares	0.65	0.65	0.66	0.68	0.71	0.72	0.72	0.72	0.72	0.72
End-of-period basic shares	0.65	0.65	0.65	0.72	0.72	0.72	0.72	0.72	0.72	0.72
BALANCE SHEET										
Investment properties	-	-	-	-	-	-	-	-	-	-
Property, plant and equipment	-	-	-	-	-	-	-	-	-	-
Land bank	-	-	-	-	-	-	-	-	-	-
Interests in associates and JCEs	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Investments	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Receivables (L/T)	-	-	-	-	-	-	-	-	-	-
Intangible assets	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Deferred tax assets	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Other assets (L/T)	3.2	3.7	4.0	4.0	3.9	3.9	3.9	3.9	3.9	3.9
Total non-current assets	4	4	4	5	5	5	5	5	5	5
Properties completed/under development	-	-	-	-	-	-	-	-	-	-
Inventories	0.6	0.8	1.0	1.1	1.1	1.2	1.4	1.5	1.6	1.8
Receivables (S/T)	1.1	1.1	1.3	1.5	1.4	1.5	1.7	1.9	2.0	2.2
Other assets (S/T)	0.5	0.5	0.6	0.7	1.4	1.4	1.4	1.4	1.4	1.4
Restricted cash and investments	0.0	0.0	0.0	0.7	0.1	0.1	0.1	0.1	0.1	0.1
Cash and cash equivalents	0.8	0.7	0.8	2.1	7.4	6.5	7.1	7.9	8.7	9.8
Total current assets	3	3	4	6	11	11	12	13	14	15
Total assets	7	7	8	11	16	15	16	17	18	20
Deferred revenue	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Payables	0.4	0.6	0.6	0.6	0.5	0.6	0.6	0.7	0.8	0.8
Taxes payable	0.1	0.0	0.1	0.3	1.0	0.2	0.2	0.2	0.2	0.3
Other liabilities (S/T)	0.9	1.0	1.4	1.3	1.7	1.7	1.7	1.7	1.7	1.7
Bank and other borrowings (S/T)	0.9	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total current liabilities	2	3	3	3	4	4	4	4	4	4
Bank and other borrowings (L/T)	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Deferred tax liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other liabilities (L/T)	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Total non-current liabilities	1	1	0	0	0	0	0	0	0	0
Total liabilities	3	3	3	3	5	4	4	4	4	4
Issued capital	0.3	0.3	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.6
Share premium and reserves	0.7	0.7	0.7	2.3	2.2	2.2	2.2	2.2	2.2	2.2
Retained earnings	2.4	2.7	3.3	3.8	8.0	8.1	9.1	10.0	11.0	12.2
Shareholders' equities	3	4	4	7	11	11	12	13	14	15
Perpetual securities	-	-	-	-	-	-	-	-	-	-
Minority interests	0.3	0.4	0.5	0.6	0.5	0.5	0.4	0.5	0.5	0.6
Total equities	4	4	5	7	11	11	12	13	14	16
Total liabilities and equities	7	7	8	11	16	15	16	17	18	20

Source: Bloomberg, Macquarie Research, November 2018

Appendices

Fig 56 Management

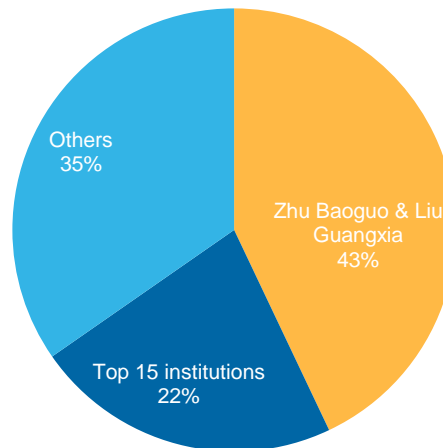
	Zhu Baoguo (朱保國)	Tao Desheng (陶德勝)	Xu Guoxiang (徐國祥)	Fu Daotian (傅道田)	Wen Hong (溫弘)
Management	<ul style="list-style-type: none"> Chairman Non-executive Director 	<ul style="list-style-type: none"> Vice Chairman President Executive Director 	<ul style="list-style-type: none"> Vice President Executive Director 	<ul style="list-style-type: none"> Vice President Executive Director Chief Scientist 	<ul style="list-style-type: none"> Chief Scientist
Age & Relationship	• Age 55	• Age 53	• Age 55	• Age 55	
Scientific & Education	• Bachelor in chemistry, Henan Normal University	• Bachelor in chemistry, Nanjing School of Pharmaceutical Sciences • Certified Pharmacist • Senior Engineer in pharmaceutical manufacturing (professor)	• EMBA, Medical School of Peking University	• PhD, Iowa State University	• PhD, Purdue University
History & Experience	1985-86 Technician, Xinxiang No.5 Chemical Factory 1986-92 General Manager of Shenzhen branch, Xinxiang No.5 Chemical Factory 1993-now Founder and Chairman of Taitai Pharma 2002-now Chairman, Livzon Pharma 2006-13 President, Livzon Pharma	1985 Joined Livzon Pharma 2005-14 Vice President, Livzon Pharma 2009-now Executive Director, Livzon Pharma 2014-now President and Vice Chairman, Livzon Pharma	2000-05 Board Director, Yangtze River Pharma 2007 Chief Sales Supervisor and General Manager of Henan branch, Livzon Pharma 2007-now Vice President, Livzon Pharma 2017-now Executive Director, Livzon Pharma	1989 PhD graduated 1990-92 Post-doc research at the Complex Carbohydrate Research Center, University of Georgia 1992-98 Analysis & Research Manager and Quality Control Manager, Neose Pharma 1998-01 Division Director, Genzyme Transgenics 2001-12 Technology Director, Senior Technology Director and Vice President, Genzyme Transgenics 2012 Joined Livzon Pharma as leading scientist for MAB R&D	2002 PhD graduated 2002-06 Senior Scientist, Pfizer 2006-08 Scientist at Novartis, participated in 30+ R&D projects 2008-18 Scientist at FDA 2018 Joined Livzon as Chief Scientist
Compensation & Stock position	<ul style="list-style-type: none"> Annual salary: 2017 0.09mn, 2016 0.09mn Controlling shareholder with 44.8% interest 	<ul style="list-style-type: none"> Annual salary: 2017 2.88mn, 2016 1.25mn Shareholder with 0.08 interest 	<ul style="list-style-type: none"> Annual salary: 2017 2.91mn, 2016 1.17mn Shareholder with 0.06 interest 	<ul style="list-style-type: none"> Annual salary: 2017 1.18mn, 2016 1.15mn 	
Special notes			• In charge of sales and marketing	• General Manager of Livzon MAB, leading R&D of biologics	• In charge of R&D

Source: Company Data, Macquarie Research, November 2018

Fig 57 Ownership Structure (as of November)

Top 5 institutions:
 Institution A 5.50%
 Institution B 3.59%
 Institution C 2.03%
 Institution D 1.92%
 Institution E 1.55%

Southbound stake was 10.54% at Nov.8, 2018



Source: FactSet, Macquarie Research, November 2018

Macquarie Quant View

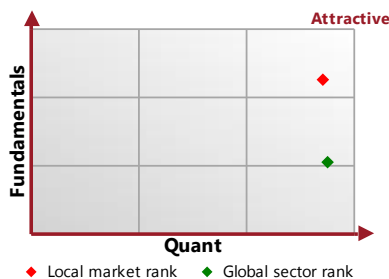
The Quant View page below has been derived from models that are developed and maintained by Sales and Trading personnel at Macquarie. The models are not a product of the Macquarie Research Department.

The quant model currently holds a strong positive view on Livzon Pharmaceutical Group (A-Share). The strongest style exposure is Quality, indicating this stock is likely to have a superior and more stable underlying earnings stream. The weakest style exposure is Growth, indicating this stock has weak historic and/or forecast growth. Growth metrics focus on both top and bottom line items.

79/948

Global rank in
Pharma, Biotech & Life Sciences

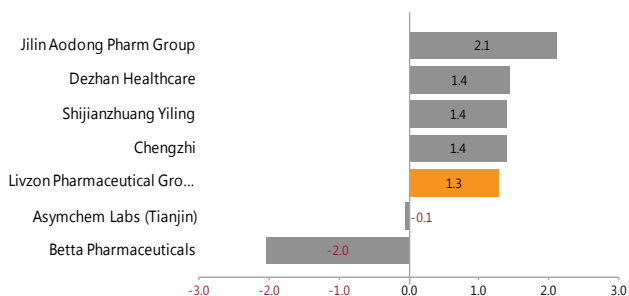
% of BUY recommendations: 78% (7/9)
Number of Price Target downgrades: 4
Number of Price Target upgrades: 2



Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.
Two rankings: Local market (China A) and Global sector (Pharma, Biotech & Life Sciences)

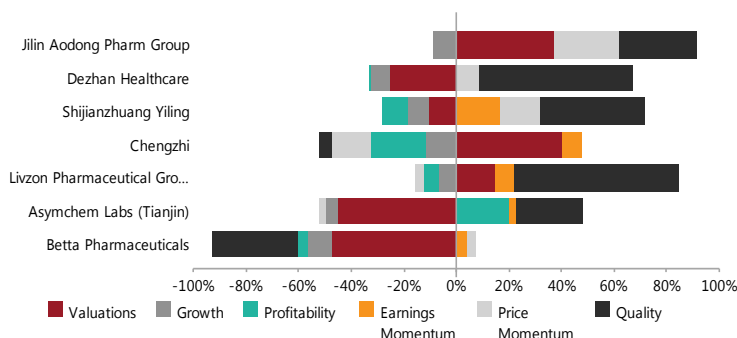
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



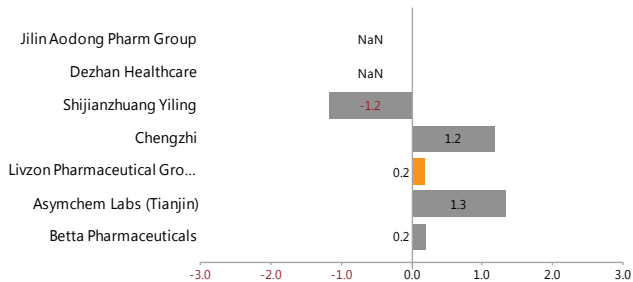
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



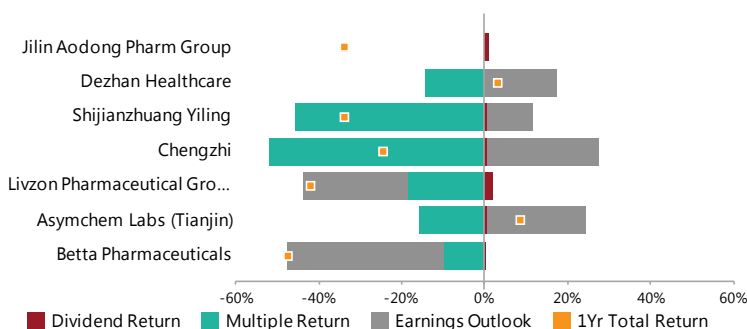
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



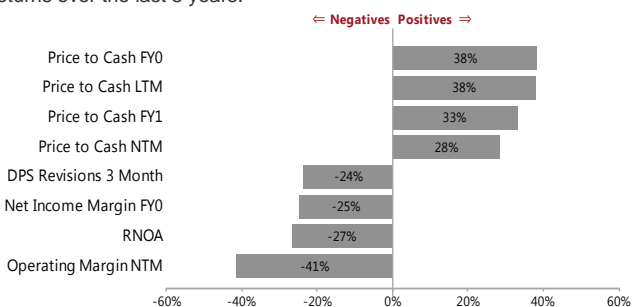
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



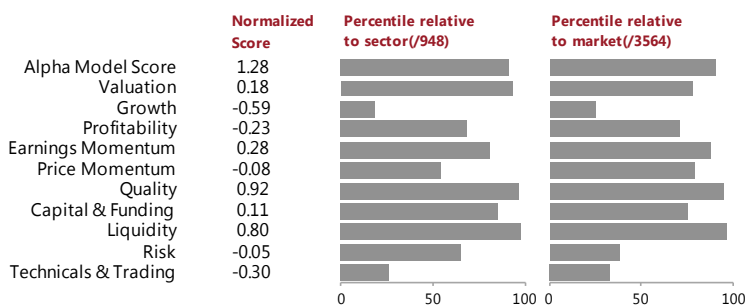
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Quant. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpq@macquarie.com)

Livzon Pharmaceutical Group (A-Share) (000513 CH, Outperform, Target Price: Rmb40.72)

Interim Results					Profit & Loss						
		1H/18A	2H/18E	1H/19E	2H/19E		2017A	2018E	2019E	2020E	
Revenue	m	4,501	4,414	5,102	5,102	Revenue	m	8,402	8,914	10,204	11,352
Gross Profit	m	2,792	2,776	3,199	3,199	Gross Profit	m	5,319	5,568	6,398	7,129
Cost of Goods Sold	m	1,708	1,638	1,903	1,903	Cost of Goods Sold	m	3,083	3,346	3,806	4,223
EBITDA	m	833	740	890	890	EBITDA	m	1,546	1,572	1,781	1,939
Depreciation	m	185	175	180	180	Depreciation	m	359	359	359	359
Amortisation of Goodwill	m	0	0	0	0	Amortisation of Goodwill	m	0	0	0	0
Other Amortisation	m	0	0	0	0	Other Amortisation	m	0	0	0	0
EBIT	m	648	565	711	711	EBIT	m	1,187	1,213	1,422	1,580
Net Interest Income	m	95	52	73	73	Net Interest Income	m	75	147	147	147
Associates	m	1	-1	0	0	Associates	m	1	0	0	0
Exceptionals	m	-20	20	0	0	Exceptionals	m	4,653	0	0	0
Forex Gains / Losses	m	0	0	0	0	Forex Gains / Losses	m	0	0	0	0
Other Pre-Tax Income	m	94	6	0	0	Other Pre-Tax Income	m	-192	100	0	0
Pre-Tax Profit	m	818	642	784	784	Pre-Tax Profit	m	5,725	1,460	1,569	1,727
Tax Expense	m	-142	-78	-99	-136	Tax Expense	m	-1,237	-220	-236	-259
Net Profit	m	676	564	685	648	Net Profit	m	4,488	1,240	1,333	1,468
Minority Interests	m	-42	-24	-23	-23	Minority Interests	m	-59	-67	-46	-100
Reported Earnings	m	633	540	662	625	Reported Earnings	m	4,429	1,173	1,287	1,368
Adjusted Earnings	m	571	502	662	625	Adjusted Earnings	m	820	1,073	1,287	1,368
EPS (rep)		0.88	0.75	0.92	0.87	EPS (rep)		4.12	1.63	1.79	1.90
EPS (adj)		0.79	0.70	0.92	0.87	EPS (adj)		1.15	1.49	1.79	1.90
EPS Growth yoy (adj)	%	112.0	79.0	15.9	24.4	EPS Growth (adj)	%	28.3	95.2	19.9	6.3
						PE (rep)	x	8.3	21.0	19.1	18.0
						PE (adj)	x	44.7	22.9	19.1	18.0
EBITDA Margin	%	18.5	16.8	17.5	17.5	Total DPS		1.18	0.45	0.54	0.57
EBIT Margin	%	14.4	12.8	13.9	13.9	Total Div Yield	%	3.5	1.3	1.6	1.7
Earnings Split	%	53.2	46.8	51.4	48.6	Basic Shares Outstanding	m	935	719	719	719
Revenue Growth	%	6.9	5.3	13.4	15.6	Diluted Shares Outstanding	m	1,075	719	719	719
EBIT Growth	%	2.9	1.4	9.7	25.8						
Profit and Loss Ratios					Cashflow Analysis						
		2017A	2018E	2019E	2020E		2017A	2018E	2019E	2020E	
Revenue Growth	%	11.6	6.1	14.5	11.3	EBITDA	m	0	1,247	1,375	1,480
EBITDA Growth	%	19.6	1.7	13.3	8.9	Tax Paid	m	-1,290	-220	-236	-259
EBIT Growth	%	27.6	2.2	17.2	11.1	Chgs in Working Cap	m	793	-1,009	-287	-249
Gross Profit Margin	%	63.3	62.5	62.7	62.8	Net Interest Paid	m	0	147	147	147
EBITDA Margin	%	18.4	17.6	17.5	17.1	Other	m	1,658	0	0	0
EBIT Margin	%	14.1	13.6	13.9	13.9	Operating Cashflow	m	1,161	164	1,000	1,119
Net Profit Margin	%	9.8	12.0	12.6	12.1	Acquisitions	m	4,480	1	0	0
Payout Ratio	%	154.8	30.0	30.0	30.0	Capex	m	0	0	0	0
EV/EBITDA	x	16.7	11.7	10.3	9.5	Asset Sales	m	-292	0	0	0
EV/EBIT	x	21.7	15.2	12.9	11.6	Other	m	468	0	0	0
Balance Sheet Ratios						Investing Cashflow	m	4,656	1	0	0
ROE	%	9.5	9.9	11.4	11.1	Dividend (Ordinary)	m	-44	-1,106	-322	-386
ROA	%	9.0	7.8	9.1	9.4	Equity Raised	m	0	0	0	0
ROIC	%	17.2	21.7	21.0	22.2	Debt Movements	m	-350	0	-0	-0
Net Debt/Equity	%	-57.7	-49.1	-50.6	-52.6	Other	m	-83	8	-20	54
Interest Cover	x	nmf	nmf	nmf	nmf	Financing Cashflow	m	-478	-1,099	-342	-332
Price/Book	x	3.0	2.3	2.1	1.9	Net Chg in Cash/Debt	m	5,339	-933	657	787
Book Value per Share		11.5	15.1	16.4	17.8	Free Cashflow	m	1,161	164	1,000	1,119
					Balance Sheet						
		2017A	2018E	2019E	2020E		2017A	2018E	2019E	2020E	
Cash	m	7,494	6,561	7,218	8,005	Cash	m	7,494	6,561	7,218	8,005
Receivables	m	1,357	1,465	1,677	1,866	Receivables	m	1,357	1,465	1,677	1,866
Inventories	m	1,103	1,192	1,356	1,504	Inventories	m	1,103	1,192	1,356	1,504
Investments	m	0	0	0	0	Investments	m	0	0	0	0
Fixed Assets	m	0	0	0	0	Fixed Assets	m	0	0	0	0
Intangibles	m	200	200	200	200	Intangibles	m	200	200	200	200
Other Assets	m	5,744	5,743	5,743	5,743	Other Assets	m	5,744	5,743	5,743	5,743
Total Assets	m	15,898	15,161	16,194	17,318	Total Assets	m	15,898	15,161	16,194	17,318
Payables	m	617	665	741	810	Payables	m	617	665	741	810
Short Term Debt	m	1,012	1,012	1,012	1,012	Short Term Debt	m	1,012	1,012	1,012	1,012
Long Term Debt	m	1	1	1	1	Long Term Debt	m	1	1	1	1
Provisions	m	1,072	213	226	246	Provisions	m	1,072	213	226	246
Other Liabilities	m	1,962	1,962	1,962	1,962	Other Liabilities	m	1,962	1,962	1,962	1,962
Total Liabilities	m	4,664	3,853	3,941	4,030	Total Liabilities	m	4,664	3,853	3,941	4,030
Shareholders' Funds	m	10,773	10,840	11,804	12,786	Shareholders' Funds	m	10,773	10,840	11,804	12,786
Minority Interests	m	461	468	448	502	Minority Interests	m	461	468	448	502
Other	m	0	0	0	0	Other	m	0	0	0	0
Total S/H Equity	m	11,234	11,308	12,253	13,288	Total S/H Equity	m	11,234	11,308	12,253	13,288
Total Liab & S/H Funds	m	15,898	15,161	16,194	17,318	Total Liab & S/H Funds	m	15,898	15,161	16,194	17,318

All figures in Rmb unless noted.

Source: Company data, Macquarie Research, November 2018

Important disclosures:

Recommendation definitions

Macquarie - Australia/New Zealand

Outperform – return >3% in excess of benchmark return
 Neutral – return within 3% of benchmark return
 Underperform – return >3% below benchmark return

Benchmark return is determined by long term nominal GDP growth plus 12 month forward market dividend yield, which is currently around 9%.

Macquarie – Asia/Europe

Outperform – expected return >+10%
 Neutral – expected return from -10% to +10%
 Underperform – expected return <-10%

Mazi Macquarie – South Africa

Outperform – expected return >+10%
 Neutral – expected return from -10% to +10%
 Underperform – expected return <-10%

Macquarie - Canada

Outperform – return >5% in excess of benchmark return
 Neutral – return within 5% of benchmark return
 Underperform – return >5% below benchmark return

Macquarie - USA

Outperform (Buy) – return >5% in excess of Russell 3000 index return
 Neutral (Hold) – return within 5% of Russell 3000 index return
 Underperform (Sell) – return >5% below Russell 3000 index return

Volatility index definition*

This is calculated from the volatility of historical price movements.

Very high–highest risk – Stock should be expected to move up or down 60–100% in a year – investors should be aware this stock is highly speculative.

High – stock should be expected to move up or down at least 40–60% in a year – investors should be aware this stock could be speculative.

Medium – stock should be expected to move up or down at least 30–40% in a year.

Low–medium – stock should be expected to move up or down at least 25–30% in a year.

Low – stock should be expected to move up or down at least 15–25% in a year.

* Applicable to Asia/Australian/NZ/Canada stocks only

Recommendations – 12 months

Note: Quant recommendations may differ from Fundamental Analyst recommendations

Financial definitions

All "Adjusted" data items have had the following adjustments made:

Added back: goodwill amortisation, provision for catastrophe reserves, IFRS derivatives & hedging, IFRS impairments & IFRS interest expense
 Excluded: non-recurring items, asset revals, property revals, appraisal value uplift, preference dividends & minority interests

EPS = adjusted net profit / efpowa*

ROA = adjusted ebit / average total assets

ROA Banks/Insurance = adjusted net profit / average total assets

ROE = adjusted net profit / average shareholders' funds

Gross cashflow = adjusted net profit + depreciation
 *equivalent fully paid ordinary weighted average number of shares

All Reported numbers for Australian/NZ listed stocks are modelled under IFRS (International Financial Reporting Standards).

Recommendation proportions – For quarter ending 30 September 2018

	AU/NZ	Asia	RSA	USA	CA	EUR	
Outperform	51.56%	59.51%	45.05%	46.88%	67.86%	46.70%	(for global coverage by Macquarie, 3.70% of stocks followed are investment banking clients)
Neutral	33.20%	28.92%	37.36%	47.70%	25.00%	42.73%	(for global coverage by Macquarie, 2.04% of stocks followed are investment banking clients)
Underperform	15.23%	11.57%	17.58%	5.42%	7.14%	10.57%	(for global coverage by Macquarie, 0.47% of stocks followed are investment banking clients)

000513 CH vs CSI 300, & rec history



(all figures in CNY currency unless noted)

Note: Recommendation timeline – if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.
 Source: FactSet, Macquarie Research, November 2018

12-month target price methodology

000513 CH: Rmb40.72 based on a PER methodology

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Date	Stock Code (BBG code)	Recommendation	Target Price
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