Supplementary information

A tale of two ecosystems: the biopharma landscape in China and India

In the format provided by the authors and unedited

Data and analysis

The analysis used databases and analyst reports for China and India from multiple sources, such as Bloomberg, FactSet and company annual reports (2023, or latest year available) for financial data; PitchBook, Bain Private Equity reports, BiotechGate and BCIQ for private equity and venture funding data; and press releases, PharmaDeals, Citeline, McKinsey and UBS reports for dealmaking data. Given the broad sets of data from multiple sources for China and India, including information from local sources such as NovaaOne Capital, the analyses triangulated and cross-referenced various data points to ensure a robust directional guidance and comparison on each of the parameters assessed for the two markets.

Private equity and venture investments

Data on the private equity (PE) and venture capital (VC) investments from 2014–2023 for China and India were collected from the BioCentury (BCIQ) database. The data were further triangulated with data from PitchBook and Venture Intelligence, as well as discussions with local sources in China and India. The investment data is only for biopharma companies, and excludes any PE/VC deals for hospitals, medical devices, diagnostics and healthcare services companies. The annual investment figures are shown in Chart 1 below; all numbers are in billions of US dollars (converted at exchange rate for deals, as applicable).

Annual investments in China declined ~70% from 2021 (\$5.8 billion) to 2023 (\$1.9 billion), the lowest annual investment since 2018 (\$3.1 billion), showing the decreasing risk appetite for China assets, close to levels last seen in 2017. In contrast, although India has seen a significant decline as well, 2023 investments of ~\$1 billion are still higher than 2018 levels. Additionally, there are increased capital flows into India-based contract development and manufacturing (CDMO) players, driven by diversification of biopharmaceutical supply chain, and in healthcare infrastructure and services (hospitals, diagnostics labs) in India.

Chart 1



Biopharma PE/VC investments, US\$ Billions

Source: BCIQ, Bain PE reports, PitchBook, discussions with local sources, internet search exchange rate of USD:CNY = 7.25, USD:INR = 83

R&D investments from local players

The R&D investments from 15 Chinese and 15 Indian biopharma companies were collected from 2023 annual reports of listed companies (for India, the FY 2023–2024 data were collected, given April–March financial year). Table 1 below shows the absolute investment in dollars, converted from local currency, where applicable. As guidance for current and potential future biopharma research intensity, the most recent R&D investment figures from 2023 were used; the historical absolute R&D investments are trending growth for both China and India (data not shown). Additionally, India-listed subsidiaries of multinational pharmaceutical companies (such as Abbott, GSK, Pfizer and Sanofi) were excluded from the dataset.

Although most of the China biopharma are investing significantly in R&D, at double-digit percentage of revenue levels, none of the Indian biopharma in the dataset are investing significantly in their R&D programs (mid-single-digit percentages of revenues).

Table 1

2023 R&D investment by China and India Biopharma companies; all figures in US\$ Millions							
China							
	R&D (\$ Million)	% of sales		R&D (\$ Million)	% of sales		
BeiGene	1,780	81%	Sun Pharma	385	7%		
Innovent	270	32%	Cipla	190	6%		
Akeso	80	72%	Divi's Labs	90	1%		
Hansoh	290	21%	Zydus	160	7%		
Hutchmed	300	36%	Dr Reddy's	275	8%		
Zai Lab	265	99%	Torrent	65	5%		
Genscript	435	52%	Lupin	185	8%		
Remgen	180	119%	Aurobindo	18	5%		
Keymed	85	168%	Alkem Labs	65	4%		
Innocare	105	102%	Biocon	140	8%		
Cansino	110	76%	Gland Pharma	20	3%		
Simcere	240	27%	Glenmark	130	9%		
Alphamab	55	185%	IPCA	20	3%		
Luye	80	10%	Alembic	60	8%		
Fosun Pharma	600	11%	Natco	10	2%		
Median	240	72%	Median	90	6%		

Source: Bloomberg, FactSet, Company Annual reports; exchange rate of USD:CNY = 7.25, USD:INR = 83 FY 2024 data or most recent available data was used for India companies given April-March fiscal year

Dealmaking data

Out-licensing of innovative assets from local biopharma to big pharma companies is often viewed as validation of the quality of such assets. Chart 2 below captures total transaction value (upfront and milestone payments) for out-licensing deals from Chinese and Indian companies to multinational players. Additionally, data for key deals from 2014–2023, with total value >\$250 million (including upfronts and milestones), are shown in Table 2 below.

There are multiple innovative asset deals where big pharma companies have in-licensed molecules from Chinese biopharma companies; however, there is minimal deals activity in this space for India. Most transactions in India are focused on branded generics/formulations, with local biopharma acquiring other local companies, acquisition/in-licensing of established brands or branded generics, or private equity companies acquiring equity stakes in local biopharma players; key deals for India are shown in Table 2 for comparison. Olema's in-licensing and research collaboration for oncology novel small molecules with Dr Reddy's subsidiary Aurigene, and Viatris' acquisition of Famy Life Sciences' ophthalmology clinical pipeline are a few exceptions.

Chart 2



Value of innovative asset licensing transactions, US\$ Billions

Source: UBS, PharmaDeals, company releases, internet search Value includes upfronts and milestones payments

Table 2

Biopharma transactions for China and India players, 2014-2023 (not exhaustive; select key deals, with at least \$250MM total value, listed here)

China deals			India deals				
Acquirer	Seller	Deal focus	Deal value (US\$ millions) *	Acquirer	Seller	Deal focus	Deal value (US\$ millions) *
Merck	Sichuan Kelun	ADCs	9,500	Sun Pharma	Ranbaxy	Branded generics	4,000
BMS	SystImmune	ADCs	8,400	Unilever	GSK	Consumer health	3,750
Seagen	RemeGen	ADCs	2,600	Biocon	Viatris	Biosimilars	3,300
Novartis	BeiGene	PD-1	2,200	Fosun	Gland Pharma	Branded generics	1,300
AbbVie	I-Mab	Immuno-onco	1,940	Nirma	Glenmark	API formulations	690
AstraZeneca	Eccogene	Oral GLP-1RA	1,825	Sun Pharma	Concert Pharma	Dermatology	575
BioNTech	Duality	ADCs	1,670	Advent	Bharat Serums	Branded generics	500
GSK	Hansoh	ADCs	1,570	Carlyle	Piramal	Branded/Consumer	490
Merck KGaA	Hengrui	ADC, PARP1	1,500	Cipla	InvaGen/Exelan	Branded generics	550
AstraZeneca	Gracell	CAR-T	1,200	Olema	Dr Reddy	Novel oncology targets	440
Takeda	Hutchmed	VEGFR TKI	1,130	KKR	JB Chemicals	Branded generics	415
Novartis	Legend	CAR-T	1,110	Sun Pharma	Taro	Branded generics	350
Eli Lilly	Innovent	PD-1	1,025	Torrent	Elder Pharma	Branded generics	325
Biogen	InnoCare	BTK	840	Viatris	Famy Life Sciences	Ophthalmology assets	280
Roche	Zion Pharma	Her2 TKI	680	ADIA	Intas	Branded generics	270
J&J	Legend	CAR-T	350 **	PAG	Optimus Drugs	Branded generics	260
J&J	CBMG	CAR-T	245 **	Torrent	Curatio	Branded generics	250

* Deal value includes upfronts, milestones payments (at the then exchange rates for local currency deals); investment amount used for equity transactions ** Upfront payment only; rest of financials not disclosed

Source: Company press releases, PharmaDeals; exchange rate of USD:CNY = 7.25, USD:INR = 83

Public market returns

Data for 15 China biopharma companies listed on the Hong Kong stock exchange and 15 leading Indian biopharma players listed on the Indian stock exchange — the same set of companies as the one used for R&D investments — were used for comparison of equity returns between the two markets (Table 3). Given that there is only one Indian biopharma company listed on the New York stock exchange (NYSE) (Dr Reddy's) versus >20 Chinese biotech companies listed on the NYSE (as of Dec 29, 2023), using local Hong Kong and India exchanges was a better gauge for comparative returns. Although not ideal given the liquidity, capital flows and macroeconomic influences on these two exchanges, it serves as the closest proxy given the lack of substrate from India on the NYSE. Additionally, India-listed subsidiaries of multinational pharmaceutical companies (such as Abbott, Pfizer, Sanofi, and GSK) were excluded from the dataset given the premium these companies typically attract on the Indian stock exchange. Furthermore, to capture the true divergence between innovative biopharma and generics companies, only the innovative biotechs from China that are listed on the Hong Kong stock exchange were captured in the dataset, whereas the Indian dataset was comprised entirely of generics companies, given the lack of substrate for innovative biotech from India listed on any exchanges. All figures are rounded to nearest whole number; for Chinese biotech companies listed on the Hong Kong exchange that do not have 5-year or 10-year listed history, the overall return since listing until 29 December 2023 was used as proxy for the returns for respective 5-year or 10-year returns. The returns for Chinese biotech companies listed Biotech Index (50 largest biotech companies listed in Hong Kong), which has declined ~70% over a 3-year and declined ~50% over a 5-year period.

Finally, the data only capture absolute share price returns for each stock, and do not include any dividends, spinouts, etc., that would capture the overall shareholder returns, so may not be completely accurate measure; however, they do provide indicative comparative returns between China and India.

Public equity returns							
China	Year ending Dec 29, 2023			India	Year ending Dec 29, 2023		
	3-yr	5-yr	10-yr		3-yr	5-yr	10-yr
BeiGene	-46%	6%	6%	Sun Pharma	111%	237%	125%
Innovent	-11%	91%	128%	Cipla	51%	138%	207%
Akeso	22%	90%		Divi's Labs	1%	166%	524%
Hansoh	-58%	-20%		Zydus	44%	105%	353%
Hutchmed	-43%	-22%	38%	Dr Reddy's	11%	123%	130%
Zai Lab	-75%	-66%		Torrent	65%	160%	870%
Genscript	76%	91%	1400%	Lupin	32%	65%	53%
Remgen	-60%	-44%		Aurobindo	17%	49%	455%
Keymed	-29%			Alkem Labs	76%	173%	235%
Innocare	-49%	-36%		Biocon	-46%	-6%	261%
Cansino	-86%	-31%		Gland Pharma	5%	2%	
Simcere	-25%	-37%		Glenmark	69%	28%	65%
Alphamab	-59%	-54%		IPCA	2%	184%	210%
Luye	3%	-29%	-43%	Alembic	-14%	127%	649%
Fosun Pharma	-54%	-18%	-26%	Natco	-16%	14%	385%
Median	-46%	-26%	22%	Median	17%	123%	248%

Table 3

Source: Bloomberg, FactSet; 10-yr missing data for certain China companies is due to lack of listing history

Data limitations

Although the data provide robust directional guidance for each of the parameters between the two markets, they do not provide a precise estimate given data triangulation from multiple sources, including local datasets, that may not capture full scope of information for each market. They do, however, provide a good comparison between China and India.

The dataset for 15 Chinese and 15 Indian biopharma companies for R&D investments and returns profiles is a used as proxy for the broader biopharma landscape, given that the 15 Indian players represent ~70% of overall market capitalization of all Indian biopharma, and the 15 Chinese companies represent ~45% of the Hong Kong Biotech Index; however, there are potential limitations in extrapolating from this subset to the broader landscape, as private companies are excluded given the limited availability of such data. The private equity and venture investments data (Chart 1) was used to complement and address these potential limitations.