Last Price4.78 CNY
1 Nov 2024

Fair Value Estimate
4.00 CNY
1 Nov 2024 19:47, UTC

Price/FVE 1.20 Market Cap 1.67 CNY Tril 1 Nov 2024 Economic Moat™
Narrow

Equity Style Box

Large Value

Uncertainty Medium **Capital Allocation** Standard ESG Risk Rating Assessment¹

Oct 2024 05:00, UTC

Iris Tan, CFA

Senior Equity Analyst
Morningstar
+86 755 8826 3018
iris.tan@morningstar.com

Contents

ESG Risk

Analyst Note (1 Nov 2024) Business Description Financials

Research Methodology for Valuing Companies

Important Disclosure

The conduct of Morningstar's analysts is governed by Code of Ethics/Code of Conduct Policy, Personal Security Trading Policy (or an equivalent of), and Investment Research Policy. For information regarding conflicts of interest, please visit: http://global.morningstar.com/equitydisclosures.

The primary analyst covering this company does not own its

Reporting Currency: CNY | Trading Currency: CNY Currency amounts expressed with "\$" are in U.S. dollars (USD) unless otherwise denoted.

The ESG Risk Rating Assessment is a representation of Sustainalytics' ESG Risk Rating.

China SOE Bank Earnings: Fair Value Estimates Rise for Selected Banks on Eased Asset-Quality Pressure

Analyst Note Iris Tan, CFA, Senior Equity Analyst, 1 Nov 2024

We have raised our fair value estimates for some of China's SOE banks after third-quarter earnings. Our fair value estimate for Agricultural Bank of China, or ABC, rises 16% to HKD 4.4; for Industrial and Commercial Bank of China, or ICBC, by 8% to HKD 5.4; and for China Construction Bank, or CCB, by 10% to HKD 6.8. This adjustment reflects our reduction in credit cost assumptions by 2 basis points-8 basis points for 2024 and 2025 after China's recent economic stimulus package. Our FVEs for the other three SOE banks, namely Bank of China, or BOC; Bank of Communications, or BoCom; and Postal Savings Bank of China, or PSBC, are unchanged.

PSBC, CCB, ICBC, and ABC are the most undervalued among SOE banks, with 27%, 21%, 13%, and 11% upside to our FVEs, respectively. We judge PSBC to have the highest earnings sensitivity to the economic cycle and think it merits a modest valuation premium over the Big Four banks due to its unique market position and solid rural demand. Shares have recently been pressured by market concerns over its capital injection plan, but we think the market has not priced in the benefit to PSBC from the significant reduction in deposit agency fee rates.

We believe a capital injection would ultimately boost investor confidence by providing downside support to credit growth in case of unexpected economic slowdown. Assuming the injection raises each bank's core Tier 1 ratio by 1 percentage point, we estimate a stand-alone earnings-per-share dilution of 6%-11%. Banks with smaller capital surpluses above minimum regulatory requirements, such as PSBC and BoCom, may be among the first to receive injections. For banks with stronger capital positions, the timing and amount of any capital injection would be determined on a case-by-case basis to mitigate adverse market reactions.

Financial Summary and Key Statistics				
Actu	ual		Forecast	
	2022	2023	2024	2025
Net Interest Income (CNY Mil)	589,883	571,750	591,244	630,696
Non Interest Income (CNY Mil)	104,769	123,078	127,421	134,820
Total Pre-Provision Revenue (CNY Mil)	694,652	694,828	718,665	765,517
Provision for Loan Losses (CNY Mil)	145,266	135,707	134,509	142,446
Operating Expenses (CNY Mil)	241,401	250,328	265,150	285,498
Operating Income (CNY Mil)	306,453	307,419	317,632	336,199
Net Income Available to Common Stockholders (CNY Mil)	259,232	269,356	278,320	294,616
Earnings Per Share (Diluted) (CNY)	0.69	0.72	0.75	0.79
Adjusted Earnings Per Share (Diluted) (CNY)	0.69	0.72	0.75	0.79
Adjusted EPS Growth %	6.4	4.7	3.6	5.3
ROE %	10.2	9.7	9.3	9.0
Price/Earnings	4.2	5.1	6.4	6.1
Price/Book	_	_	_	_

Source: Morningstar Valuation Model. Data as of 01 Nov 2024.



4.78 CNY 1 Nov 2024

Fair Value Estimate 4.00 CNY 1 Nov 2024 19:47, UTC Price/FVE Market Cap 1 67 CNY Tril 1.20

Economic $\mathbf{Moat}^{\mathsf{TM}}$ Narrow

Equity Style Box Large Value Uncertainty Medium

Capital Allocation Standard

ESG Risk Rating Assessment¹ **\$\$\$** 2 Oct 2024 05:00, UTC

Sector

Industry

🚅 Financial Services Banks - Diversified

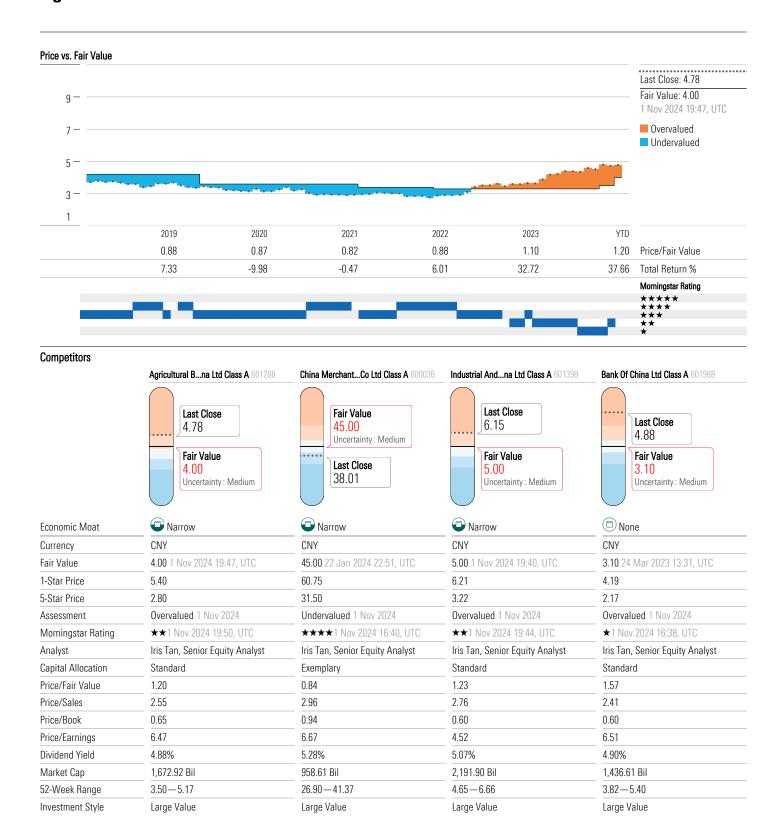
Business Description

As one of the big four banks, ABC is headquartered in Beijing. The bank evolved from a state-owned specialized bank to a state-controlled commercial bank. It listed on the Hong Kong and Shanghai Stock Exchanges in 2010. ABC operates more than 20,000-branch network in China, providing corporate and retail banking products and services, and carries out treasury operations for its own accounts or for its customers. Shareholders Central Huijin, China's stateowned investment company, and the Ministry of Finance own 40.14% and 35.29%, respectively. Corporate banking, retail banking, and wholesale banking accounted for 41%, 56%, and 3% of total revenue in the first half of 2024, respectively. Rural banking and urban banking contributed 50% and 50% of total revenue during the same period.

Revenue and net profit growth improved across the sector in the third guarter, driven by narrower NIM contraction and lower credit costs. ABC, in particular, reported net profit growth at 3.4%, outperforming on loan growth and lower provision expenses, while other SOE banks reported in -line growth of 0.1% to 0.5%, except for BoCom, which posted negative growth.

ICBC, CCB and BOC experienced greater NIM pressure among SOE banks, with year-over-year contractions of 23 to 24 basis points. In contrast, ABC and PSBC, benefiting from a stable rural deposit base and less competitive rural banking market, saw smaller NIM contraction of 16 basis points-17 basis points. The recent symmetric rate cuts to both deposit and loan rates have had a neutral impact on banks' NIM, and we expect NIM to stabilize in the fourth quarter. Our forecast remains for NIM contraction of 15 basis points-25 basis points in 2024 and mid to high-single-digit basis points in 2025, factoring in future loan repricing and mortgage rate adjustments. We project SOE banks to achieve zero-1% growth in 2024 net profit and dividend per share, with the exception of ABC, which is expected to grow by 3.5%. III







Last Price 4.78 CNY 1 Nov 2024

Fair Value Estimate 4.00 CNY 1 Nov 2024 19:47, UTC Price/FVE 1.20

Market Cap 1.67 CNY Tril

Narrow

Economic Moat[™] Equity Style Box Large Value Uncertainty Medium

Capital Allocation Standard

ESG Risk Rating Assessment¹ **00000** 2 Oct 2024 05:00, UTC

Morningstar Valuation Model Summary										
Financials as of 01 Nov 2024		Actual			Forecast					
Fiscal Year, ends 31 Dec		2021	2022	2023	2024	2025	2026	2027	2028	
Net Interest Income (CNY Mil)		577,987	589,883	571,750	591,244	630,696	711,559	795,023	879,922	
Non Interest Income (CNY Mil)		141,928	104,769	123,078	127,421	134,820	143,998	154,460	165,916	
Total Pre-Provision Revenue (CNY Mil)		719,915	694,652	694,828	718,665	765,517	855,558	949,483	1,045,838	
Provision for Loan Losses (CNY Mil)		165,886	145,266	135,707	134,509	142,446	178,833	216,190	260,405	
Operating Expenses (CNY Mil)		258,217	241,401	250,328	265,150	285,498	316,512	348,411	380,631	
Operating Income (CNY Mil)		295,880	306,453	307,419	317,632	336,199	358,839	383,508	403,428	
Net Income Available to Common Stockholders (CNY Mil)		241,183	259,232	269,356	278,320	294,616	314,487	336,139	353,623	
Adjusted Net Income (CNY Mil)		227,385	241,993	253,293	262,478	276,337	294,381	314,205	329,860	
Weighted Average Diluted Shares Outstanding (Mil)		349,983	349,983	349,983	349,983	349,983	349,983	349,983	349,983	
Earnings Per Share (Diluted) (CNY)		0.65	0.69	0.72	0.75	0.79	0.84	0.90	0.94	
Adjusted Earnings Per Share (Diluted) (CNY)		0.65	0.69	0.72	0.75	0.79	0.84	0.90	0.94	
Dividends Per Share (CNY)		-0.21	-0.22	-0.23	-0.24	-0.25	-0.27	-0.29	-0.30	
Margins & Returns as of 01 Nov 2024		Actual			Forecast					
Č	3 Year Avg	2021	2022	2023	2024	2025	2026	2027	2028	5 Year Avg
Net Interest Margin %	1.8	2.0	1.8	1.5	1.4	1.3	1.4	1.4	1.4	1.4
Efficiency Ratio % Provision as % of Loans	35.6 0.8	35.9 1.0	34.8 0.7	36.0 0.6	36.9 0.5	37.3 0.5	37.0 0.6	36.7 0.6	36.4 0.7	36.9 0.6
Growth & Ratios as of 01 Nov 2024	0.0	Actual	0.7	0.0	Forecast	0.3	0.0	0.0	0.7	0.0
diowal d flatos as of of floor 2024	3 Year Avg	2021	2022	2023	2024	2025	2026	2027	2028	5 Year Avg
Net Interest Income Growth %	1.6	6.0	2.1	-3.1	3.4	6.7	12.8	11.7	10.7	9.0
Non Interest Income Growth %	2.9	25.7	-26.2	17.5	3.5	5.8	6.8	7.3	7.4	6.2
Total Pre-Provision Revenue Growth %	_	9.4	-3.5	0.0	3.4	6.5	11.8	11.0	10.2	
Operating Expenses Growth %	_	13.2	-6.5	3.7	5.9	7.7	10.9	10.1	9.3	_
Operating Income Growth %	_	12.0	3.6	0.3	3.3	5.9	6.7	6.9	5.2	
Net Income Growth %	7.2	12.1	7.5	3.9	3.3	5.9	6.7	6.9	5.2	
Earnings Per Share Growth %	7.2	10.6	6.4	4.7	3.6	5.3	6.5	6.7	5.0	5.4
Valuation as of 01 Nov 2024		Actual			Forecast					
D. (5.)		2021	2022	2023	2024	2025	2026	2027	2028	
Price/Earnings		4.5	4.2	5.1	6.4	6.1	5.7	5.3	5.1	
Price/Book Price/Tangible Book		0.5	0.5	0.5	0.7	0.6	0.5	0.5	0.5	
Dividend Yield %		7.1	6.1	4.8	5.0	5.2	5.6	6.1	6.3	
Dividend Payout %		31.8	32.1	31.9	31.8	32.0	32.1	32.1	32.2	
Operating Performance / Profitability as of 01 Nov 2024		Actual			Forecast					
Fiscal Year, ends 31 Dec		2021	2022	2023	2024	2025	2026	2027	2028	
ROA %		0.9	0.8	0.7	0.7	0.6	0.6	0.6	0.6	
ROE %		10.4	10.2	9.7	9.3	9.0	8.8	8.6	8.3	
Return on Tangible Equity %		11.7	11.5	11.1	10.6	10.3	10.1	9.8	9.5	



Last Price 4.78 CNY 1 Nov 2024	Fair Value Estimate 4.00 CNY 1 Nov 2024 19:47, UTC	Price/FVE 1.20	Market Ca 1.67 CN ¹ 1 Nov 2024	Y Tril	Economi Nar	c Moat[™] row	Equity Sty Larg		Unce Med	rtainty ium	Capital Allocation Standard	@ @(Rating Assessmen 0 (0) (1) 05:00, UTC
Financial Leverage	e (Reporting Currency)			Actu	al			Forecast					
Fiscal Year, ends 31	Dec				2021	2022	2023	20	24	2025	2026	2027	2028
Equity/Assets %					8.3	7.9	7.2	7	'.0	6.9	6.9	6.9	6.9
Forecast Revision	s as of			2024				2025			2026		
Prior data as of					Current		Prior		Current		Prior	Current	Pr
Fair Value Estimate	e Change (Trading Curren	cy)			4.00				_			_	
Net Interest Incom	e (CNY Mil)				591,244		591,244		630,696		630,696	711,559	711,5
Total Pre-Provision	Revenue (CNY Mil)				718,665		718,665		765,517		765,517	855,558	855,5
Operating Income ((CNY Mil)				317,632		310,426		336,199		322,760	358,839	349,8
Net Income (CNY N	Mil)				_		_		_		_	_	
Earnings Per Share	(Diluted) (CNY)				0.75		0.73		0.79		0.76	0.84	0.
Adjusted Earnings	Per Share (Diluted) (CNY				0.75		0.73		0.79		0.76	0.84	0.
Dividends Per Shar	re (CNY)				-0.24		-0.23		-0.25		-0.24	-0.27	-0.
Key Valuation Driv	vers as of 01 Nov 2024			Discou	nted Cash F	low Valu	iation as o	f 01 Nov 2	2024				
Cost of Equity %			11.0										CNY I
Stage II Net Incom			4.0		t Value Stage								
Stage II Incrementa	al ROIC %		5.0		t Value Stage								
Perpetuity Year			15	Presen	t Value of the	e Perpetu	ity						
Additional estimates and so	cenarios available for download at ht	tps://pitchbook.com/		Total Co	ommon Equity	Value be	fore Adjust	ment					
				Other A	Adjustments								
				Equity \	/alue								1,208,8
				Project	ed Diluted SI	nares							349,9

Fair Value per Share (CNY)



4.00

Last Price 4.78 CNY 1 Nov 2024

Fair Value Estimate 4.00 CNY 1 Nov 2024 19:47, UTC Price/FVE 1.20

Market Cap 1.67 CNY Tril

Narrow

Economic Moat[™] Equity Style Box Large Value Uncertainty Medium

Capital Allocation Standard

ESG Risk Rating Assessment¹ **00000**

2 Oct 2024 05:00, UTC

Income Statement (CNY)	Actual			Forecast				
Fiscal Year, ends 31 Dec	2021	2022	2023	2024	2025	2026	2027	2028
Net Interest Income (Mil)	577,987	589,883	571,750	591,244	630,696	711,559	795,023	879,922
Provision for Losses on Loans (Mil)	165,886	145,266	135,707	134,509	142,446	178,833	216,190	260,405
Net Interest Income after Provision (Mil)	412,101	444,617	436,043	456,735	488,250	532,727	578,833	619,517
Non-Interest Income (Mil)	141,928	104,769	123,078	127,421	134,820	143,998	154,460	165,916
Net Revenue (Mil)	719,915	694,652	694,828	718,665	765,517	855,558	949,483	1,045,838
Net Revenue After Provision (Excluding Gains on Sale) (Mil)	554,029	549,386	559,121	584,155	623,071	676,725	733,293	785,433
Gains on Sale (Mil)	0	0	0	0	0	0	0	0
Net Revenue After Provision (Including Gains on Sale) (Mil)	554,029	549,386	559,121	584,155	623,071	676,725	733,293	785,433
Non-Interest Expense (Mil)	258,217	241,401	250,328	265,150	285,498	316,512	348,411	380,631
Operating Income (Excluding Gains on Sale) (Mil)	295,880	306,453	307,419	317,632	336,199	358,839	383,508	403,428
Taxes (Mil)	53,944	47,587	37,599	38,848	41,119	43,888	46,905	49,341
Minority Interest, net of income taxes (Mil)	753	-366	464	464	464	464	464	464
Income after Taxes (Mil)	241,183	259,232	269,356	278,320	294,616	314,487	336,139	353,623
Other After-Tax Items (Mil)	0	0	0	0	0	0	0	0
Preferred Dividends (Mil)	13,798	17,239	16,063	15,842	18,279	20,107	21,935	23,762
Net Income Attributable to Common Shareholders	241,183	259,232	269,356	278,320	294,616	314,487	336,139	353,623
(Excluding All After-tax Items) (Mil)								
Net Income Attributable to Common Shareholders (Including All After-tax Items) (Mil)	241,183	259,232	269,356	278,320	294,616	314,487	336,139	353,623
Weighted Average Diluted Shares Outstanding (Mil)	349,983	349,983	349,983	349,983	349,983	349,983	349,983	349,983
Diluted Earnings Per Share	0.65	0.69	0.72	0.75	0.79	0.84	0.90	0.94
Diluted Earnings Per Share (Adjusted)	0.65	0.69	0.72	0.75	0.79	0.84	0.90	0.94
Dividends Per Common Share (CNY)								



Last Price 4.78 CNY 1 Nov 2024

Fair Value Estimate 4.00 CNY 1 Nov 2024 19:47, UTC Price/FVE 1.20

Market Cap 1.67 CNY Tril

Narrow

Economic Moat[™] Equity Style Box Large Value Uncertainty Medium

Capital Allocation Standard

ESG Risk Rating Assessment¹ **00000**

2 Oct 2024 05:00, UTC

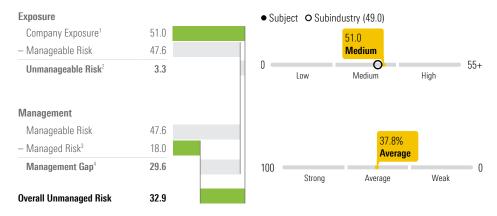
Balance Sheet (CNY)	Actual			Forecast				
Fiscal Year, ends 31 Dec	2021	2022	2023	2024	2025	2026	2027	2028
Assets								
Securities (Bil)	460	636	627	689	793	872	959	1,055
Loans and Leases (Bil)	17,175	19,764	22,615	25,424	28,329	31,282	34,230	37,114
Allowance for Loan Losses (Bil)	-721	-783	-883	-977	-748	-783	-792	-710
Net Loans and Leases (Bil)	16,455	18,981	21,732	24,447	27,581	30,499	33,438	36,403
All Other Earning Assets (Bil)	11,721	13,869	17,003	19,043	20,947	22,832	24,659	26,385
Premises & Equipment, Net (Bil)	153	153	157	163	170	176	183	191
Goodwill (Bil)	1	1	1	1	1	1	1	1
Identifiable Intangibles (Bil)	27	28	29	29	29	29	29	29
Deferred Tax Assets (Bil) Other Non-Earning Assets (Other Real Estate Owned etc.) (Bil)	143	150	161		161 164	161 164	161	161
	109	108	164				164	164
Total Assets (Bil)	29,069	33,925	39,873	44,697	49,845	54,735	59,595	64,390
Liabilities								
Deposits (Bil)	24,277	28,481	33,679	38,141	42,813	47,202	51,568	55,822
Total Debt (Bil)	1,508	1,869	2,296	2,133	2,136	2,119	2,102	2,123
Deferred Tax Liabilities (Bil)	1	0	0	0	0	0	0	0
All Other Liabilities (Bil)	863	901	1,001	1,302	1,466	1,649	1,826	2,016
Total Liabilities (Bil)	26,648	31,252	36,976	41,576	46,415	50,970	55,495	59,961
Equity								
Common Stock + Paid-in Capital + Treasury Stock (Bil)	523	523	523	523	523	523	523	523
Retained Earnings (Bil)	1,498	1,669	1,844	2,029	2,258	2,533	2,807	3,076
Preferred Equity (Bil)	360	440	480	520	600	660	720	780
AOCI + Other Equity (Bil)	33	36	42	42	42	42	42	42
Shareholders Equity (Bil)	2,415	2,668	2,889	3,114	3,422	3,758	4,092	4,421
Total Liabilities & Shareholders Equity (Including Minority Interest) (Bil)	0	0	0	0	0	0	0	0



Last Price Fair Value Estimate Price/FVE Market Cap **Economic Moat™ Equity Style Box Capital Allocation** ESG Risk Rating Assessment¹ Uncertainty 4.78 CNY 4.00 CNY 1 67 CNY Tril Narrow Medium Standard **\$\$\$** 1.20 Large Value 2 Oct 2024 05:00, UTC 1 Nov 2024 1 Nov 2024 19:47, UTC

ESG Risk Rating Breakdown

ESG Risk Rating



- Exposure represents a company's vulnerability to ESG risks driven by their business model
- ► Exposure is assessed at the Subindustry level and then specified at the company level
- ➤ Scoring ranges from 0-55+ with categories of low, medium, and high-risk exposure
- Management measures a company's ability to manage ESG risks through its commitments and actions
- Management assesses a company's efficiency on ESG programs, practices, and policies
- ► Management score ranges from 0-100% showing how much manageable risk a company is managing

ESG Risk Rating Assessment⁵













ESG Risk Ratings measure the degree to which a company's value is impacted by environmental, social, and governance risks, by evaluating the company's ability to manage the ESG risks it faces.

1. A company's Exposure to material ESG issues 2. Unmanageable Risk refers to risks that are inherent to a particular business model that cannot be managed by programs or initiatives 3. Managed Risk = Manageable Risk multiplied by a Management score of 37.8% 4. Management Gap assesses risks that are not managed, but are considered manageable 5. ESG Risk Rating Assessment = Overall Unmanaged Risk = Management Gap plus Unmanageable Risk

ESG Risk Rating is of Oct 02, 2024. Highest Controversy Level is as of Oct 08, 2024. Sustainalytics Subindustry, Diversified Banks. Sustainalytics provides Morningstar with company ESG ratings and metrics on a monthly basis and as such, the ratings in Morningstar may not necessarily reflect current Sustainalytics' scores for the company. For the most up to date rating and more information, please visit: sustainalytics.com/esg-ratings/.

Peer Analysis 02 Oct 2024	Doors are salested f	rom the companyle Custoinelyti	ing defined Cubindusts	y and are displayed based on th	a alaaaat markat aan u	dues
•	reers are selected i	rom the company's Sustamaryti		iine2		
Company Name	Exposure		Management		ESG Risk Rating	
Agricultural Bank of China Ltd	51.0 Medium	0 55+	37.8 Average	100 0	32.9 High	0
Bank Of China Ltd	51.2 Medium	0 55+	44.1 Average	100 0	30.1 High	0 — 40+
Industrial And Cank Of China Ltd	50.4 Medium	0	41.1 Average	100 0	31.0 High	0 — 40+
China Merchants Bank Co Ltd	40.7 Medium	0 55+	40.8 Average	100 - 0	24.8 Medium	0 — 40+
China Construction Bank Corp	51.4 Medium	0 55+	52.9 Strong	100 0	26.1 Medium	0



Overview

At the heart of our valuation system is a detailed projection of a company's future cash flows, resulting from our analysts' research. Analysts create custom industry and company assumptions to feed income statement, balance sheet, and capital investment assumptions into our globally standardized, proprietary discounted cash flow, or DCF, modeling templates. We use scenario analysis, indepth competitive advantage analysis, and a variety of other analytical tools to augment this process. Moreover, we think analyzing valuation through discounted cash flows presents a better lens for viewing cyclical companies, high-growth firms, businesses with finite lives (e.g., mines), or companies expected to generate negative earnings over the next few years. That said, we don't dismiss multiples altogether but rather use them as supporting cross-checks for our DCF-based fair value estimates. We also acknowledge that DCF models offer their own challenges (including a potential proliferation of estimated inputs and the possibility that the method may miss shortterm market-price movements), but we believe these negatives are mitigated by deep analysis and our longterm approach.

Morningstar's equity research group ("we," "our") believes that a company's intrinsic worth results from the future cash flows it can generate. The Morningstar Rating for stocks identifies stocks trading at a discount or premium to their intrinsic worth—or fair value estimate, in Morningstar terminology. Five-star stocks sell for the biggest risk adjusted discount to their fair values, whereas 1-star stocks trade at premiums to their intrinsic worth.

Four key components drive the Morningstar rating: (1) our assessment of the firm's economic moat, (2) our estimate of the stock's fair value, (3) our uncertainty around that fair value estimate and (4) the current market price. This process ultimately culminates in our singlepoint star rating.

1. Economic Moat

The concept of an economic moat plays a vital role not only in our qualitative assessment of a firm's long-term investment potential, but also in the actual calculation of our fair value estimates. An economic moat is a structural feature that allows a firm to sustain excess profits over a long period of time. We define economic profits as re-

turns on invested capital (or ROIC) over and above our estimate of a firm's cost of capital, or weighted average cost of capital (or WACC). Without a moat, profits are more susceptible to competition. We have identified five sources of economic moats: intangible assets, switching costs, network effect, cost advantage, and efficient scale.

Companies with a narrow moat are those we believe are more likely than not to achieve normalized excess returns for at least the next 10 years. Wide-moat companies are those in which we have very high confidence that excess returns will remain for 10 years, with excess returns more likely than not to remain for at least 20 years. The longer a firm generates economic profits, the higher its intrinsic value. We believe low-quality, no-moat companies will see their normalized returns gravitate toward the firm's cost of capital more quickly than companies with moats.

When considering a company's moat, we also assess whether there is a substantial threat of value destruction, stemming from risks related to ESG, industry disruption, financial health, or other idiosyncratic issues. In this context, a risk is considered potentially value destructive if its occurrence would eliminate a firm's economic profit on a cumulative or midcycle basis. If we deem the probability of occurrence sufficiently high, we would not characterize the company as possessing an economic moat.

2. Estimated Fair Value

Combining our analysts' financial forecasts with the firm's economic moat helps us assess how long returns on invested capital are likely to exceed the firm's cost of capital. Returns of firms with a wide economic moat rating are assumed to fade to the perpetuity period over a longer period of time than the returns of narrow-moat firms, and both will fade slower than no-moat firms, increasing our estimate of their intrinsic value.

Our model is divided into three distinct stages:

Stage I: Explicit Forecast

In this stage, which can last five to 10 years, analysts make full financial statement forecasts, including items such as revenue, profit margins, tax rates, changes in workingcapital accounts, and capital spending. Based on these projections, we calculate earnings before interest, after taxes (EBI) and the net new investment (NNI) to de-

rive our annual free cash flow forecast.

Stage II: Fade

The second stage of our model is the period it will take the company's return on new invested capital—the return on capital of the next dollar invested ("RONIC")—to decline (or rise) to its cost of capital. During the Stage II period, we use a formula to approximate cash flows in lieu of explicitly modeling the income statement, balance sheet, and cash flow statement as we do in Stage I. The length of the second stage depends on the strength of the company's economic moat. We forecast this period to last anywhere from one year (for companies with no economic moat) to 10-15 years or more (for wide-moat companies). During this period, cash flows are forecast using four assumptions: an average growth rate for EBI over the period, a normalized investment rate, average return on new invested capital (RONIC), and the number of years until perpetuity, when excess returns cease. The investment rate and return on new invested capital decline until a perpetuity value is calculated. In the case of firms that do not earn their cost of capital, we assume marginal ROICs rise to the firm's cost of capital (usually attributable to less reinvestment), and we may truncate the second stage.

Stage III: Perpetuity

Once a company's marginal ROIC hits its cost of capital, we calculate a continuing value, using a standard perpetuity formula. At perpetuity, we assume that any growth or decline or investment in the business neither creates nor destroys value and that any new investment provides a return in line with estimated WACC.

Because a dollar earned today is worth more than a dollar earned tomorrow, we discount our projections of cash flows in stages I, II, and III to arrive at a total present value of expected future cash flows. Because we are modeling free cash flow to the firm—representing cash available to provide a return to all capital providers—we discount future cash flows using the WACC, which is a weighted average of the costs of equity, debt, and preferred stock (and any other funding sources), using expected future proportionate long-term, market-value weights.

3. Uncertainty Around That Fair Value Estimate

Morningstar's Uncertainty Rating is designed to capture the range of potential outcomes for a company's intrinsic value. This rating is used to assign the margin of safety required before investing, which in turn explicitly drives our stock star rating system. The Uncertainty Rating is aimed at identifying the confidence we should have in assigning a fair value estimate for a given stock.

Our Uncertainty Rating is meant to take into account anything that can increase the potential dispersion of future outcomes for the intrinsic value of a company, and any-

Morningstar Equity Research Star Rating Methodology





thing that can affect our ability to accurately predict these outcomes. The rating begins with a suggested rating produced by a quantitative process based on the trailing 12-month standard deviation of daily stock returns. An analyst overlay is then applied, with analysts using the suggested rating, historical rating data, and their own knowledge of the company to inform them as they make the final Uncertainty Rating decision. Ultimately, the rating decision rests with the analyst. Analysts take into account many characteristics when making their final decision, including cyclical factors, operational and financial factors such as leverage, company-specific events, ESG risks, and anything else that might increase the potential dispersion of future outcomes and our ability to estimate those outcomes.

Our recommended margin of safety—the discount to fair value demanded before we'd recommend buying or selling the stock—widens as our uncertainty of the estimated value of the equity increases. The more uncertain we are about the potential dispersion of outcomes, the greater the discount we require relative to our estimate of the value of the firm before we would recommend the purchase of the shares. In addition, the Uncertainty Rating provides guidance in portfolio construction based on risk tolerance.

Our Uncertainty Ratings are: Low, Medium, High, Very High, and Extreme.

	Margin of Safety						
Qualitative Analysis Uncertainty Ratings	★★★★ Rating	★Rating					
Low	20% Discount	25% Premium					
Medium	30% Discount	35% Premium					
High	40% Discount	55% Premium					
Very High	50% Discount	75% Premium					
Extreme	75% Discount	300% Premium					

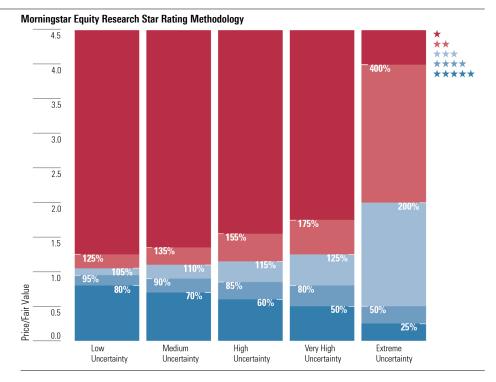
Our uncertainty rating is based on the interquartile range, or the middle 50% of potential outcomes, covering the 25th percentile—75th percentile. This means that when a stock hits 5 stars, we expect there is a 75% chance that the intrinsic value of that stock lies above the current market price. Similarly, when a stock hits 1 star, we expect there is a 75% chance that the intrinsic value of that stock lies below the current market price.

4. Market Price

The market prices used in this analysis and noted in the report come from exchange on which the stock is listed which we believe is a reliable source.

For more details about our methodology, please go to https://shareholders.morningstar.com

Morningstar Star Rating for Stocks



Once we determine the fair value estimate of a stock, we compare it with the stock's current market price on a daily basis, and the star rating is automatically re-calculated at the market close on every day the market on which the stock is listed is open. Our analysts keep close tabs on the companies they follow, and, based on thorough and ongoing analysis, raise or lower their fair value estimates as warranted.

Please note, there is no predefined distribution of stars. That is, the percentage of stocks that earn 5 stars can fluctuate daily, so the star ratings, in the aggregate, can serve as a gauge of the broader market's valuation. When there are many 5-star stocks, the stock market as a whole is more undervalued, in our opinion, than when very few companies garner our highest rating.

We expect that if our base-case assumptions are true the market price will converge on our fair value estimate over time generally within three years (although it is impossible to predict the exact time frame in which market prices may adjust).

Our star ratings are guideposts to a broad audience and individuals must consider their own specific investment goals, risk tolerance, tax situation, time horizon, income needs, and complete investment portfolio, among other factors

The Morningstar Star Ratings for stocks are defined below:

★★★★ We believe appreciation beyond a fair risk ad-

justed return is highly likely over a multiyear time frame. Scenario analysis developed by our analysts indicates that the current market price represents an excessively pessimistic outlook, limiting downside risk and maximizing upside potential.

- ★★★★ We believe appreciation beyond a fair risk-adjusted return is likely.
- ★★★ Indicates our belief that investors are likely to receive a fair risk-adjusted return (approximately cost of equity).
- ★★ We believe investors are likely to receive a less than fair risk-adjusted return.
- ★ Indicates a high probability of undesirable risk-adjusted returns from the current market price over a multiyear time frame, based on our analysis. Scenario analysis by our analysts indicates that the market is pricing in an excessively optimistic outlook, limiting upside potential and leaving the investor exposed to Capital loss.

Other Definitions

Last Price: Price of the stock as of the close of the market of the last trading day before date of the report.

Capital Allocation Rating: Our Capital Allocation (or Stewardship) Rating represents our assessment of the quality of management's capital allocation, with particular emphasis on the firm's balance sheet, investments, and shareholder distributions. Analysts consider compan-



ies' investment strategy and valuation, balance sheet management, and dividend and share buyback policies. Corporate governance factors are only considered if they are likely to materially impact shareholder value, though either the balance sheet, investment, or shareholder distributions. Analysts assign one of three ratings: "Exemplary", "Standard", or "Poor". Analysts judge Capital Allocation from an equity holder's perspective. Ratings are determined on a forward looking and absolute basis. The Standard rating is most common as most managers will exhibit neither exceptionally strong nor poor capital allocation.

Capital Allocation (or Stewardship) analysis published prior to Dec. 9, 2020, was determined using a different process. Beyond investment strategy, financial leverage, and dividend and share buyback policies, analysts also considered execution, compensation, related party transactions, and accounting practices in the rating.

Capital Allocation Rating: Our Capital Allocation (or Stewardship) Rating represents our assessment of the quality of management's capital allocation, with particular emphasis on the firm's balance sheet, investments, and shareholder distributions. Analysts consider companies' investment strategy and valuation, balance sheet management, and dividend and share buyback policies. Corporate governance factors are only considered if they are likely to materially impact shareholder value, though either the balance sheet, investment, or shareholder distributions. Analysts assign one of three ratings: "Exemplary", "Standard", or "Poor". Analysts judge Capital Allocation from an equity holder's perspective. Ratings are determined on a forward looking and absolute basis. The Standard rating is most common as most managers will exhibit neither exceptionally strong nor poor capital allocation.

Capital Allocation (or Stewardship) analysis published prior to Dec. 9, 2020, was determined using a different process. Beyond investment strategy, financial leverage, and dividend and share buyback policies, analysts also considered execution, compensation, related party transactions, and accounting practices in the rating.

Sustainalytics ESG Risk Rating Assessment: The ESG Risk Rating Assessment is provided by Sustainalytics; a Morningstar company.

Sustainalytics' ESG Risk Ratings measure the degree to which company's economic value at risk is driven by environment, social and governance (ESG) factors.

Sustainalytics analyzes over 1,300 data points to assess a company's exposure to and management of ESG risks. In other words, ESG Risk Ratings measures a company's unmanaged ESG Risks represented as a quantitative score. Unmanaged Risk is measured on an open-ended scale

starting at zero (no risk) with lower scores representing less unmanaged risk and, for 95% of cases, the unmanaged ESG Risk score is below 50.

Based on their quantitative scores, companies are grouped into one of five Risk Categories (negligible, low, medium, high, severe). These risk categories are absolute, meaning that a 'high risk' assessment reflects a comparable degree of unmanaged ESG risk across all subindustries covered.

The ESG Risk Rating Assessment is a visual representation of Sustainalytics ESG Risk Categories on a 1 to 5 scale. Companies with Negligible Risk = 5 Globes, Low Risk = 4, Medium Risk = 3 Globes, High Risk = 2 Globes, Severe Risk = 1 Globe. For more information, please visit sustainalytics.com/esg-ratings/

Ratings should not be used as the sole basis in evaluating a company or security. Ratings involve unknown risks and uncertainties which may cause our expectations not to occur or to differ significantly from what was expected and should not be considered an offer or solicitation to buy or sell a security.

Risk Warning

Please note that investments in securities are subject to market and other risks and there is no assurance or guarantee that the intended investment objectives will be achieved. Past performance of a security may or may not be sustained in future and is no indication of future performance. A security investment return and an investor's principal value will fluctuate so that, when redeemed, an investor's shares may be worth more or less than their original cost. A security's current investment performance may be lower or higher than the investment performance noted within the report. Morningstar's Uncertainty Rating serves as a useful data point with respect to sensitivity analysis of the assumptions used in our determining a fair value price.

General Disclosure

Unless otherwise provided in a separate agreement, recipients accessing this report may only use it in the country in which the Morningstar distributor is based. Unless stated otherwise, the original distributor of the report is Morningstar Research Services LLC, a U.S.A. domiciled financial institution.

This Report is for informational purposes, should not be the sole piece of information used in making an investment decision, and has no regard to the specific investment objectives, financial situation or particular needs of any specific recipient. This publication is intended to provide information to assist investors in making their own investment decisions, not to provide investment ad-

vice to any specific investor. Therefore, investments discussed herein may not be suitable for all investors; investors must exercise their own independent judgment as to the suitability of such investments and recommendations in the light of their own investment objectives, experience, taxation status and financial position. Morningstar encourages Report recipients to read all relevant issue documents (e.g., prospectus) pertaining to the security concerned, including without limitation, information relevant to its investment objectives, risks, and costs before making an investment decision and when deemed necessary, to seek the advice of a financial, legal, tax, and/or accounting professional. The information, data, analyses and opinions presented herein are not warranted to be accurate, correct, complete or timely. Unless otherwise provided in a separate agreement, neither Morningstar, Inc. or the Equity Research Group represents that the report contents meet all of the presentation and/or disclosure standards applicable in the jurisdiction the recipient is located.

Except as otherwise required by law or provided for in a separate agreement, the analyst, Morningstar, Inc. and the Equity Research Group and their officers, directors and employees shall not be responsible or liable for any trading decisions, damages or other losses resulting from, or related to, the information, data, analyses or opinions within the report.

The Report and its contents are not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or which would subject Morningstar, Inc. or its affiliates to any registration or licensing requirements in such jurisdiction.

Where this report is made available in a language other than English and in the case of inconsistencies between the English and translated versions of the report, the English version will control and supersede any ambiguities associated with any part or section of a report that has been issued in a foreign language. Neither the analyst, Morningstar, Inc., or the Equity Research Group guarantees the accuracy of the translations.

This report may be distributed in certain localities, countries and/or jurisdictions ("Territories") by independent third parties or independent intermediaries and/or distributors ("Distributors"). Such Distributors are not acting as agents or representatives of the analyst, Morningstar, Inc. or the Equity Research Group. In Territories where a Distributor distributes our report, the Distributor is solely responsible for complying with all applicable regulations, laws, rules, circulars, codes and guidelines established by local and/or regional regulatory bodies, including laws in

M\(\tag{RNINGSTAR}^\epsilon\)

connection with the distribution third-party research reports.

Conflicts of Interest

- No interests are held by the analyst with respect to the security subject of this investment research report.
- Morningstar, Inc. may hold a long position in the security subject of this investment research report that exceeds 0.5% of the total issued share capital of the security. To determine if such is the case, please click http://msi.morningstar.com and http://mdi.morningstar.com
- Analysts' compensation is derived from Morningstar, Inc.'s overall earnings and consists of salary, bonus and in some cases restricted stock.
- Neither Morningstar, Inc. or the Equity Research Group receives commissions for providing research nor do they charge companies to be rated.
- Morningstar's overall earnings are generated in part by the activities of the Investment Management and Research groups, and other affiliates, who provide services to product issuers.
- Morningstar employees may not pursue business and employment opportunities outside Morningstar within the investment industry (including but not limited to, working as a financial planner, an investment professional or investment professional representative, a broker-dealer or broker-dealer agent, a financial writer, reporter, or analyst) without the approval of Morningstar's Legal and if applicable, Compliance teams.
- Neither Morningstar, Inc. or the Equity Research Group is a market maker or a liquidity provider of the security noted within this report.
- Neither Morningstar, Inc. or the Equity Research Group has been a lead manager or co-lead manager over the previous 12-months of any publicly disclosed offer of financial instruments of the issuer.
- Morningstar, Inc.'s investment management group does have arrangements with financial institutions to provide portfolio management/investment advice some of which an analyst may issue investment research reports on. However, analysts do not have authority over Morningstar's investment management group's business arrangements nor allow employees from the investment management group to participate or influence the analysis or opinion prepared by them.
- ► Morningstar, Inc. is a publicly traded company (Ticker Symbol: MORN) and thus a financial institution the security of which is the subject of this report may own more than 5% of Morningstar, Inc.'s total outstanding shares. Please access Morningstar, Inc.'s proxy statement, "Security Ownership of Certain Beneficial Owners and Management" section https://shareholders.morningstar.com/investor-relations/financials/sec-filings/default.aspx
- Morningstar, Inc. may provide the product issuer or its related entities with services or products for a fee and

on an arms' length basis including software products and licenses, research and consulting services, data services, licenses to republish our ratings and research in their promotional material, event sponsorship and website advertising.

Further information on Morningstar, Inc.'s conflict of interest policies is available from http://global.morning-star.com/equitydisclosures. Also, please note analysts are subject to the CFA Institute's Code of Ethics and Standards of Professional Conduct.

Risk Warning Please note that investments in securities are subject to market and other risks and there is no assurance or guarantee that the intended investment objectives will be achieved. Past performance of a security may or may not be sustained in future and is no indication of future performance. A security's investment return and an investor's principal value will fluctuate so that, when redeemed, an investor's shares may be worth more or less than their original cost. A security's current investment performance may be lower or higher than the investment performance noted within the report. For investments in foreign markets there are further risks, generally based on exchange rate changes or changes in political and social conditions.

For more information about Morningstar's methodologies, please visit global.morningstar.com/equitydisclosures

For a list of securities which the Equity Research Group currently covers and provides written analysis on please contact your local Morningstar office. In addition, for historical analysis of securities covered, including their fair value estimate, please contact your local office.

For recipients in Australia: This Report has been issued and distributed in Australia by Morningstar Australasia Pty Ltd (ABN: 95 090 665 544; ASFL: 240892). Morningstar Australasia Pty Ltd is the provider of the general advice ('the Service') and takes responsibility for the production of this report. The Service is provided through the research of investment products.

To the extent the Report contains general advice it has been prepared without reference to an investor's objectives, financial situation or needs. Investors should consider the advice in light of these matters and, if applicable, the relevant Product Disclosure Statement before making any decision to invest. Refer to our Financial Services Guide (FSG) for more information at http://www.morningstar.com.au/fsg.pdf

For recipients in New Zealand: This report has been issued and distributed by Morningstar Australasia Pty Ltd and/or Morningstar Research Ltd (together 'Morningstar'). This report has been prepared and is intended for

distribution in New Zealand to wholesale clients only and has not been prepared for use by New Zealand retail clients (as those terms are defined in the Financial Markets Conduct Act 2013). The information, views and any recommendations in this material are provided for general information purposes only, and solely relate to the companies and investment opportunities specified within. Our reports do not take into account any particular investor's financial situation, objectives or appetite for risk, meaning no representation may be implied as to the suitability of any financial product mentioned for any particular investor. We recommend seeking financial advice before making any investment decision.

For recipients in Hong Kong: The Report is distributed by Morningstar Investment Management Asia Limited, which is regulated by the Hong Kong Securities and Futures Commission to provide services to professional investors only. Neither Morningstar Investment Management Asia Limited, nor its representatives, are acting or will be deemed to be acting as an investment professional to any recipients of this information unless expressly agreed to by Morningstar Investment Management Asia Limited.

For recipients in India: This investment research is issued by Morningstar Investment Adviser India Private Limited. Morningstar Investment Adviser India Private Limited is registered with SEBI as a Portfolio Manager (registration number INP000006156) and as a Research Entity (registration number INH000008686). Morningstar Investment Adviser India Private Limited has not been the subject of any disciplinary action by SEBI or any other legal/regulatory body. Morningstar Investment Adviser India Private Limited is a wholly owned subsidiary of Morningstar Investment Management LLC. In India, Morningstar Investment Adviser India Private Limited has one associate, Morningstar India Private Limited, which provides data-related services, financial data analysis, and software development. The research analyst has not served as an officer, director, or employee of the fund company within the last 12 months, nor have they or their associates engaged in market-making activity for the fund company. The ESG-related information, methodologies, tool, ratings, data and opinions contained or reflected herein are not directed to or intended for use or distribution to India-based clients or users and their distribution to Indian resident individuals or entities is not permitted, and Morningstar/Sustainalytics accepts no responsibility or liability whatsoever for the actions of third parties in this respect.

*The Conflicts of Interest disclosure above also applies to relatives and associates of Manager Research Analysts in India # The Conflicts of Interest disclosure above also applies to associates of Manager Research Analysts in India. The terms and conditions on which Morningstar In-



vestment Adviser India Private Limited offers Investment Research to clients, varies from client to client, and are detailed in the respective client agreement.

For recipients in Japan: The Report is distributed by Ibbotson Associates Japan, Inc., which is regulated by Financial Services Agency, for informational purposes only. Neither Ibbotson Associates Japan, Inc., nor its representatives, are acting or will be deemed to be acting as an investment professional to any recipients of this information.

For recipients in Singapore: For Institutional Investor audiences only. The Report is distributed by Morningstar Investment Adviser Singapore Pte. Limited, which is licensed by the Monetary Authority of Singapore to provide financial advisory services in Singapore. Morningstar Investment Adviser Singapore Pte. Limited is the entity responsible for the creation and distribution of the research services described in this presentation. Investors should consult a financial adviser regarding the suitability of any investment product, taking into account their specific investment objectives, financial situation or particular needs, before making any investment decisions.

For recipients in Korea: The report is distributed by Morningstar Korea Ltd., which has filed to the Financial Services Committee, for informational purposes only. Neither Morningstar Korea Ltd. nor its representatives are acting or will be deemed to be acting as an investment advisor to any recipients of this information.

