Analyst: Daniel Browne

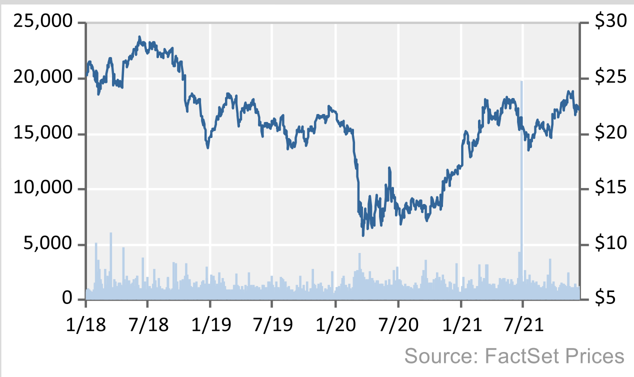
December 14, 2021

Recommendation: Hold				
Current Price	**$23.97**	---	Ticker	ASB
1 Year Bear	$14	*-37%*	Sh. Out. (M)	150.1
1 Year Base	**$23**	***8%***	M.Cap. ($B)	3.35
1 Year Bull	$29	*27%*	EV ($M)	-

Bank Holding, Commercial and Consumer Banking

Associated Banc-Corp

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	-11%	5.7%	3.1%	X%	30.7%	12.5%	-6.6%

Summary

I recommend a hold rating with a target of $23. Although ASB has a great earning potential once interest rates rise, the firm needs to continue to expand its lending capabilities. ASB's shift to focusing on interest revenue, instead of non-interest revenue, creates a riskier environment where returns are more dependant on factors outside the firm's control. The stock is undervalued based on relative analysis and overvalued based on DCF analysis.

Financials

	2017	2018	2019	2020	2021	2022F	2023F
Sales($B)	**1.22**	**1.51**	**1.55**	**1.43**	**1.15**	**1.16**	**1.20**
Gr. %	3.7%	23.8%	2.9%	-8.1%	-19 %	0.6%	4.0%
v. Cons.	-	-	-	-	-	4.1%	9.7%
Industry	9.7%	9.1%	7.5%	12.3%	6.7%	7.8%	7.8%
EPS	**$1.52**	**$1.99**	**$2.04**	**$2.00**	**$2.11**	**$1.80**	**$2.04**
Gr. %	20.6%	31.2%	2.1%	-1.5%	5.0%	-14%	13.3%
v. Cons.	-	-	-	-	-	-23%	20%
Industry	19.7%	27.0%	9.9%	-26%	75.1%	-5.8%	12.8%

Key Drivers

- Growth in deposits: ASB has seen a tremendous growth in deposits because of the government stimulus for Covid-19. This growth in deposits weighs down ROA now, but could boost earnings, if the firm successfully grows lending.
- Expanding lending capabilities: ASB announced it is launching an Auto Finance team and an Equipment Finance vertical and is anticipating significant increases in revenue.
- Company restructuring: Associated Banc-Corp recently appointed a new president and CEO, who has shifted the company's focus on improving technologies to reduce yearly expenses.
- Dispositions: ASB has sold its less profitable business lines to focus on interest revenue.
- Macroeconomic trends: With interest rates expected to rise, the firm's interest revenue is forecasted to increase, which is now its primary focus.

Ratios

	2017	2018	2019	2020	2021	2022F	2023F
NPM	**17.5%**	**18.7%**	**20.9%**	**24.2%**	**24.2%**	**30.9%**	**21.8%**
Industry	18.0%	18.1%	22.8%	21.6%	21.6%	28.7%	25.2%
ROE	6.6%	7.2%	8.4%	7.6%	7.6%	9.7%	8.1%
Industry	8.0%	7.8%	9.7%	8.1%	8.1%	9.7%	8.1%
ROA	0.7%	0.8%	1.0%	0.9%	0.9%	0.9%	0.7%
Industry	0.9%	0.9%	1.2%	0.9%	0.9%	0.9%	0.9%
A T/O	0.04	0.04	0.05	0.04	0.04	0.03	0.03
A/E	9.45	9.14	8.57	8.21	8.55	8.99	9.08

Valuation

	2017	2018	2019	2020	2021	2022F	2023F
P/E	17.9	10.5	11.5	7.4	12.1	10.6	13.8
Industry	19.1	17.2	13.2	12.8	11.7	11.8	13.4
P/S	3.29	2.8	2.23	1.69	2.93	3.14	3.02
P/B	1.28	1.11	0.96	0.7	0.9	0.9	0.8
P/CF	11.37	9.43	7.58	4.7	14.4		
V/EBITDA	-	-	-	-	-		
D/P	-	-	-	-	-		

Valuation

Using a relative valuation approach, Associated Banc-Corp is undervalued in comparison to other Midwest regional banks. The DCF analysis implies that the stock is worth $21.04, which makes it overvalued compared to its actual price of $23.97. Using a combination approach of the valuation methods, the stock is valued at about $23.

Risks

- Changes in tax laws can hinder returns.
- Cyberattacks could hurt business, especially with a large shift to the cloud.
- Market conditions have a large impact on returns.

Email: dtbrowne@uwm.edu
Phone: 262-352-4325

Company Overview

Associated Banc-Corp (ASB) is a leading regional bank which offers a variety of financial products and services across the Midwest. ASB offers branch locations in Wisconsin, Illinois, and Minnesota, as well as commercial financial services in Indiana, Michigan, Missouri, Ohio, and Texas. ASB consistently holds high regional rankings compared to competitors based off customer satisfaction. Associated Banc-Corp was founded in 1861, and is the largest bank headquartered in Wisconsin.

Associated Banc-Corp operates through the following segments: Corporate and Commercial Specialty; Community, Consumer and Business; and Risk Management and Shared Services.

Corporate and Commercial Specialty (43.5% of sales): Provides various financial services targeted towards larger businesses, developers, not-for-profits, municipalities, and financial institutions. Sales grew 29.7% over the past year. Services offered include:

- Lending solutions, such as loans and loan services.
- Deposit and cash management solutions, such as commercial checking services and liquidity solutions, and
- Specialized financial services, such as interest rate risk management, foreign exchange solutions, and commodity hedging.

> 318% growth in the Risk Management and Shared Services segment was caused by the disposition of ABRC, which recorded a $168 million pre-tax gain.

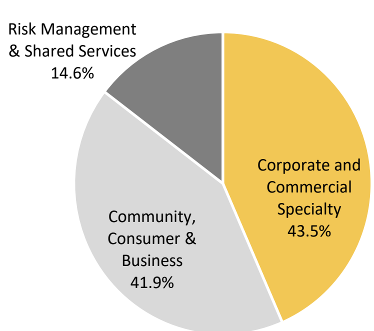
Community, Consumer and Business (41.9% of sales): Catered towards individuals, as well as small and mid-size businesses. Sales decreased by 28.1% over the past year. Services offered include:

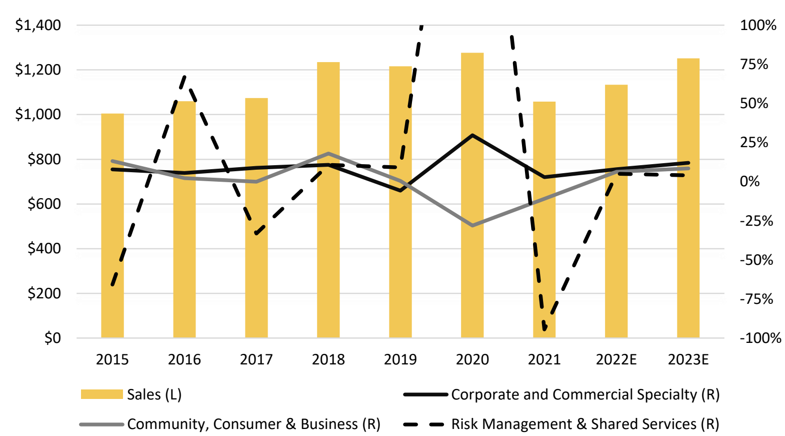
- Lending solutions, such as mortgages, personal and business loans,
- Deposit and transactional solutions, such as debit, credit and prepaid cards, online banking, and money transfer services,
- Investment services
- Insurance and benefits-related products and services, and
- Fiduciary services, such as administration of employee benefit plans and institutional asset management.

Risk Management and Shared Services (14.6% of sales): Parent company activity as well as corporate risk management, credit administration, finance, treasury, operations, and technology. Revenues grew 318% over the past year. Segment revenues include:

- Corporation's investment portfolio
- Intersegment activity

Figures 1 & 2: Revenue by segment in 2020 (left) and total revenue (in millions) & YoY revenue growth since 2015 (right)





Source: Company reports

Business/Industry Drivers

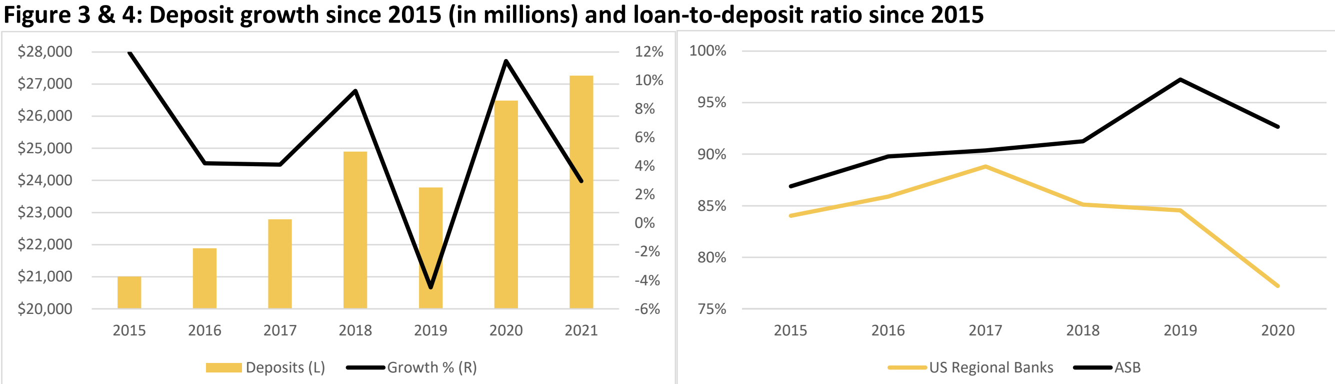
Though several factors may contribute to Associated Banc-Corp's future success, the following are the most important business drivers:

1) Growth in Deposits
2) Expanding Lending Capabilities
3) Company Restructuring
4) Dispositions
5) Macroeconomic Trends

<u>Growth in Deposits</u>

Due to the government stimulus for Covid-19, banks are flush with deposits. ASB has total deposits of over $27.2 billion, which is about a 3% growth from 2020 year-end. Pre-pandemic, Associated Bank had total deposits over $23.7 billion, which equates to a roughly 14.7% increase in deposits over 1.5 years. This increase gives ASB more money to lend, which can lead to an increase in loan balance.

Figure 3 & 4: Deposit growth since 2015 (in millions) and loan-to-deposit ratio since 2015



Source: Company Filings, Factset

Associated Banc-Corp's loans haven't grown at the same rate as its deposits, which has driven down the loan-to-deposit ratio (LDR) as seen in figure 4. Although the LDR has decreased, it is within the optimal range of 80% to 90%. This means that ASB is liquid enough to cover loans, but isn't losing out on interest revenue. ASB has consistently had a higher LDR compared to other regional banks, recording a 20% higher margin than competitors in 2020.

<u>Expanding Lending Capabilities</u>

ASB announced this year that it is launching a new Auto Finance team, specializing in consumer auto loans. It has already established agreements with over 550 car dealerships as of September 1, 2021 and is expecting to start booking loans in the fourth quarter of 2021. The company is forecasting over $1 billion in loan balances by the end of 2022, and $2 billion by the end of 2023. The total consumer loan balance as of 6/30/2021 was approximately $8.5 billion, meaning the projected balance for 2022 would account for roughly 10.5% of its total consumer portfolio.

Figure 5: Composition of total consumer loans as of Q2 2021

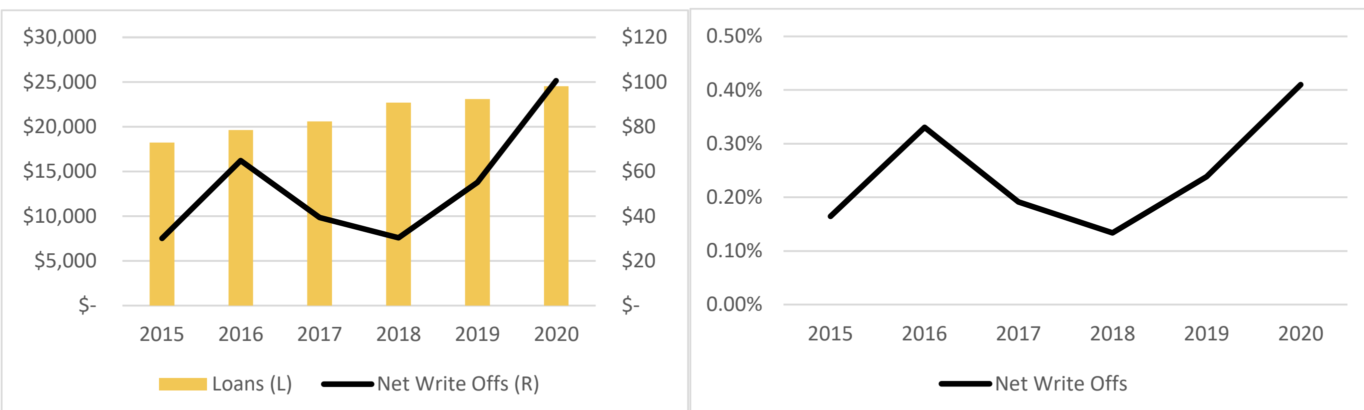
Consumer Loans	Amount (in millions)	% of Total
Residential Mortgage	$ 7,638	89.1%
Home Equity	$ 632	7.4%
Student Loans	$ 112	1.3%
Credit Cards	$ 104	1.2%
Other Consumer	$ 85	1.0%
Total	**$ 8,571**	**100.0%**

Source: Company Filings

ASB is also launching a new Equipment Finance vertical that is expected to begin operations in the first quarter of 2022. This will help diversify its commercial loan portfolios and create opportunities to develop more relationships with the many manufacturing companies located in the Midwest. The current consumer and business loan portfolio consists of 17.1% wholesale/manufacturing companies, making it the firm's second largest industry. ASB anticipates loan balances of $150 million by the end of 2022, and $300+ million by the end of 2023.

Combined, the Auto Finance and Equipment Finance teams expect to generate incremental revenues of about $20 million in 2022 and $60 million in 2023. This is roughly 5.6% of 2020 sales.

Figures 6 & 7: Net write offs compared to total loans (in millions), and Net write offs as a percentage of total loans



Source: Company Filings

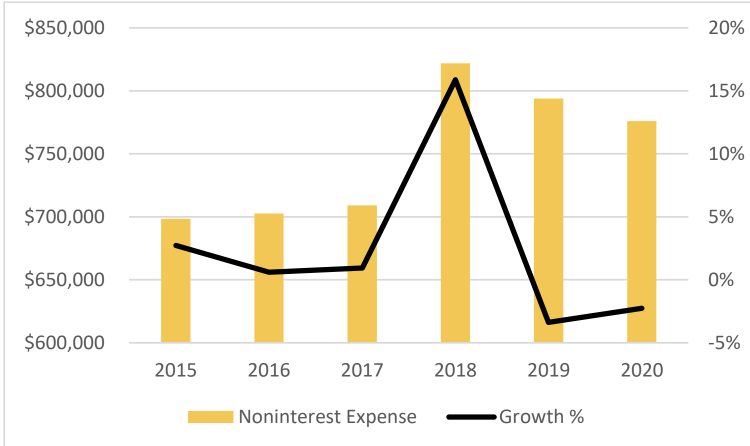
In 2020, ASB had net loan write offs of about $101 million, which was 0.41% of its total loans. Net loan write-offs nearly doubled from 2019 to 2020, due to the pandemic. As of Q2 2021, ASB had just over $9 million in net loan write offs for the first 6 months of 2021, which is a dramatic decrease from 2020. Economic conditions are much better in 2021, which is causing this improvement.

<u>Company Restructuring</u>

Associated Banc-Corp has made several sizable changes to the company, including changes in management. In Q1 of 2021, ASB appointed a new president and CEO, Andrew J Harmening. Under new leadership, ASB is shifting its focus on improving its technology so it can grow mobile banking. This will help meet customer demand and mobile banking would allow ASB to consolidate branches, which lowers expenses. These consolidations will be made in a strategic manner so the firm is still able to meet the demands of its consumers, while cutting unnecessary expenses. ASB consolidated eight branches in 2021, with an additional two branches expected to be consolidated in 2022.

Source: Company reports

Figure 8: Noninterest expense since 2015 (in thousands)



Source: Company Filings

Associated Banc-Corp is also moving about 10% of its workforce to be mostly remote and closing unnecessary offices. This will further reduce costs, and be invested into improving cloud technologies and digital banking platforms, which will cut annual expenses by roughly $10 million. This would equate to an addition of roughly $0.05 to EPS. As seen in figure 8, ASB has already been lowering its noninterest expenses since 2018. The total expected cost of the digital transformation is about $50 million, or a reduction in EPS of $0.25 meaning this investment would pay itself off in saved expenses within five years.

Dispositions

Associated Banc-Corp has been trimming its business to focus on its more profitable business. In Q1 of 2021, ASB sold one of its wealth management subsidiaries, Whitnell, to Rockefeller Capital Management. The sale was recorded at $8 million, and ASB recorded a $2 million pretax gain. In the terms of the sale, ASB is forming a partnership with Rockefeller to become one of its mortgage lending referrals and a third-party trust solution provider. Rockefeller manages around $69 billion in assets in 14 different states, which will help expand Associated Banc-Corp's operations.

In Q2 2020, ASB sold Associated Benefits & Risk Consulting (ABRC) to USI Insurance Services for $266 million. This equated to a $163 million pre-tax book gain on its Risk Management and Shared Services segment but has greatly reduced its insurance commissions and fees revenue, as seen in figure 9.

Figure 9: Insurance revenue since 2020

Insurance Commissions and Fees (In Thousands)						
Year	2020				2021	
Period	Q1	Q2	Q3	Q4	Q1	Q2
Revenue	$22,608	$22,430	$114	$93	$76	$86
Growth %	14.8%	-0.8%	-99.5%	-18.4%	-18.3%	13.2%

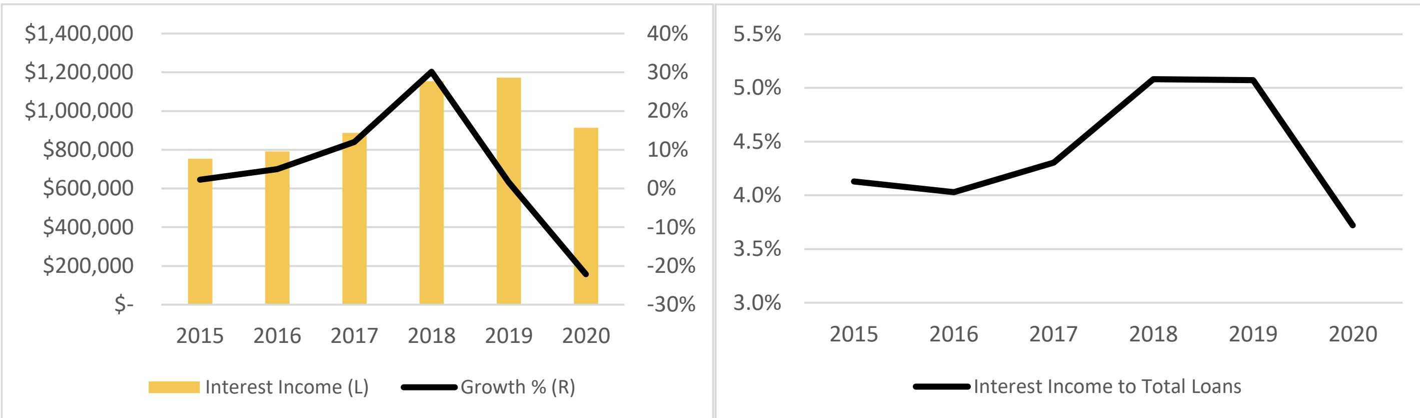
Source: Company Filings

This was a strategic disposition that gave ASB the necessary capital to expand on its lending business.

Macroeconomic Trends

Interest rates have been at all-time lows due to the pandemic. This has directly affected Associated Banc-Corp's profits. Because interest rates were at all-time lows, ASB has taken a huge hit on their interest income, which is its largest revenue item. In 2020, ASB recorded interest income of about $913 million, which was a 22.2% decrease from 2019.

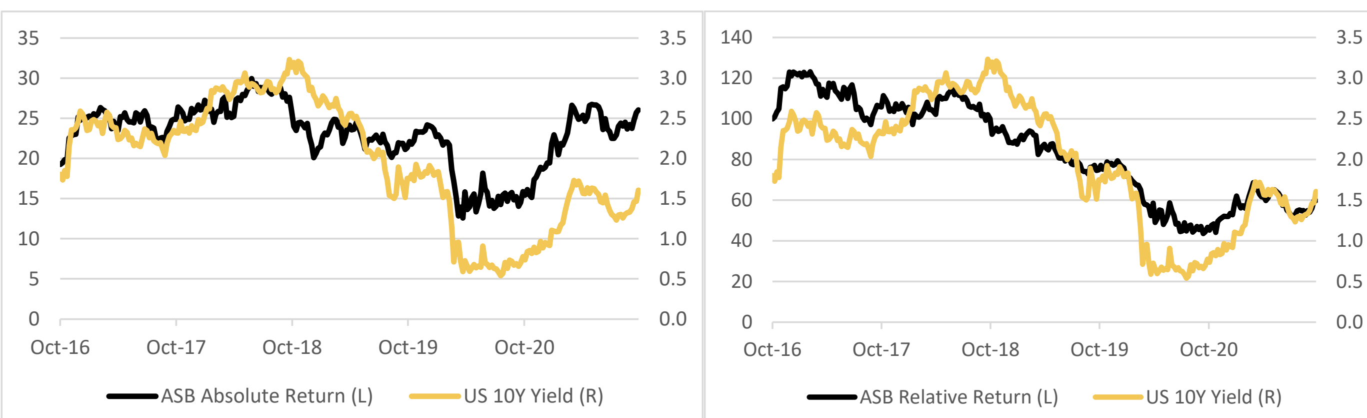
Figures 10 & 11: Interest income since 2015 (in thousands) and interest income to total sales



Source: Company Filings

As shown in figures 12 and 13, as US 10-year bond yields go down, Associated Banc-Corp's total return also decreases. This shows that as interest rates move, ASB returns follow suit. Figure 13 depicts Associated Bank's returns relative to the S&P 500, which shows the same pattern. The stock outperforms when rates rise and vice versa. Yields are beginning to rise as inflation has ramped up and the economy has improved, so this is positive for ASB.

Figures 12 & 13: Absolute return (left) and relative return (right)



Source: Factset

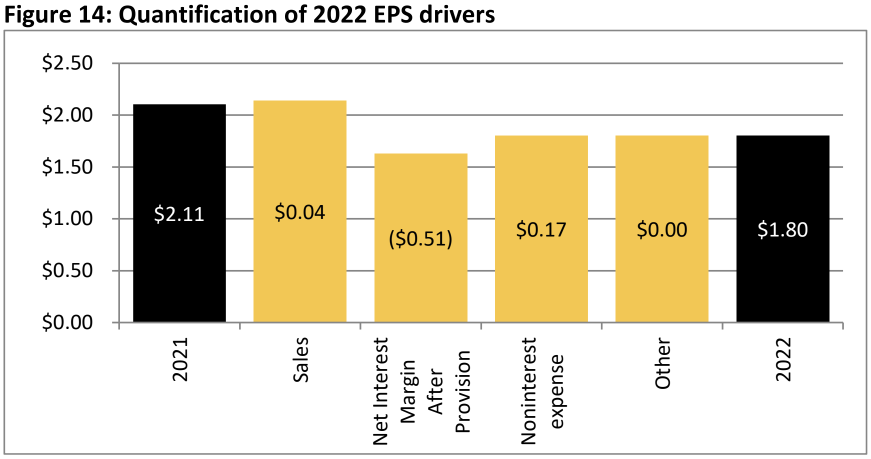
Financial Analysis

<u>Quantification of Drivers</u>

I anticipate EPS to decline by $0.31 to $1.80 in 2022. Sales will increase and raise EPS by $0.04 due to the loan growth and expected Fed tapering, causing a growth in ASB's interest income. Net interest margin after provision is expected to decrease EPS by $0.51. Savings in noninterest expenses will increase EPS by $0.17.

The expected increase in interest rates is a major driver for ASB. Associated Banc-Corp was able to withstand historically low interest rates, a rise in interest rates will much benefit. The $0.51 decrease in net interest margin is caused by an increase in expected provision for loan loss in 2022. ASB is expecting to recover about $80 million in loan losses in 2021, which grew its net interest margin to 100%, effectively cancelling out interest expenses. With ASB's focus on the consolidation of unnecessary bank branches, and a greater focus on mobile banking, noninterest expenses will continue to decrease, driving up EPS.

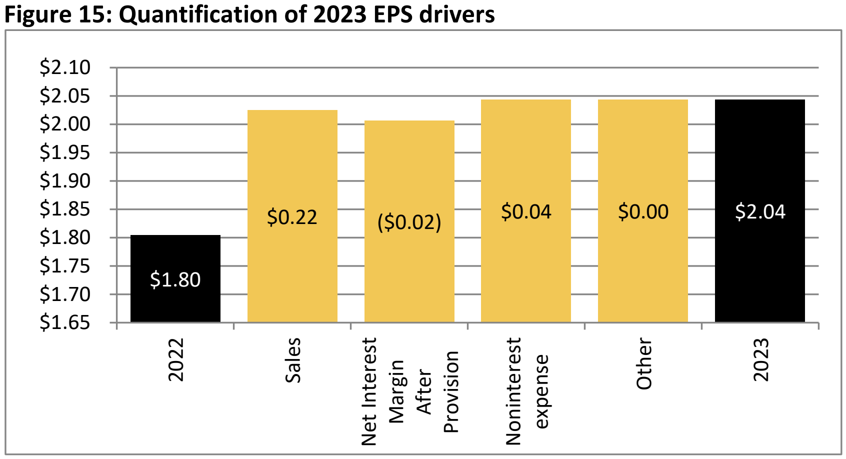
Figure 14: Quantification of 2022 EPS drivers



Source: Company Filings, IMCP

I expect 2023 EPS to increase $0.24 to $2.04. With the Fed's continued tapering as well as expected growth from new lending projects, I anticipate sales to increase EPS by $0.22. I expect net interest margin to decrease EPS by $0.02, due to increased loan losses, based off an increase in total loan balance.

Figure 15: Quantification of 2023 EPS drivers



Source: Company Reports, IMCP

Estimate and Consensus Comparison

I am more optimistic than consensus estimates for 2022 and 2023 for both EPS and sales due to ASB's expected increase in interest revenue margins, as well as it's increased lending capabilities. I am anticipating EPS to be $0.20 higher than consensus in 2022 and $0.12 higher than consensus in 2023.

Figure 16: EPS and YoY growth estimates

My Estimates	2022	2023	Consensus	2022	2023
EPS	$1.80	$2.04	EPS	$1.60	$1.92
Growth	-14.3%	13.3%	Growth	-23.5%	19.9%
Sales ($M)	1,157.00	1,203.28	Sales ($M)	1,098.97	1,204.89
Growth	0.6%	4.0%	Growth	4.0%	9.7%

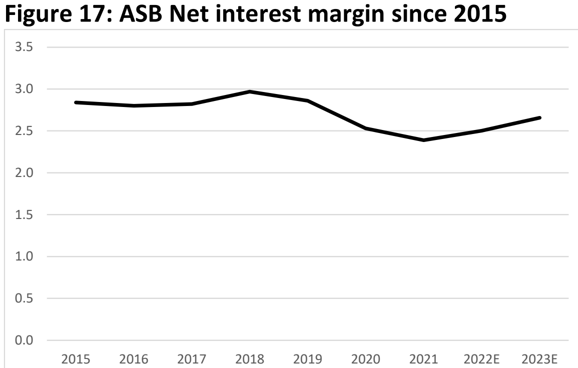
Source: Factset, IMCP

Revenues

Associated Banc-Corp's non-interest revenue/interest revenue ratio has historically been around 35-40%. In 2020, total revenues dropped by ~8% which can be attributed to the decrease in interest revenue and increase in non-interest revenue.

US Regional Bank industry average NIM was ~2.7% in 2021, meaning ASB is slightly below average.

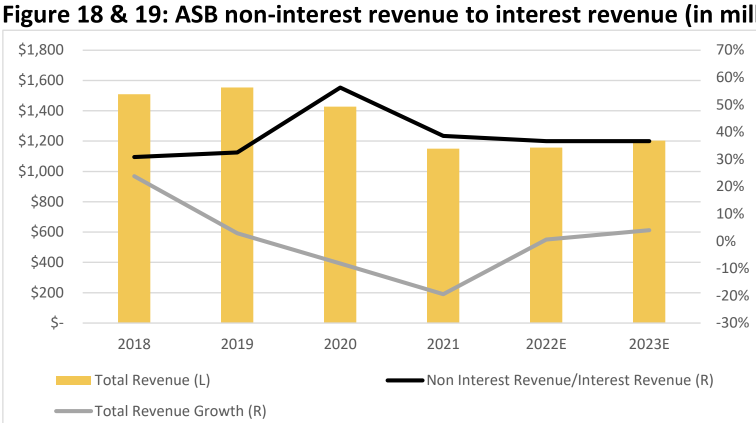
Figure 17: ASB Net interest margin since 2015

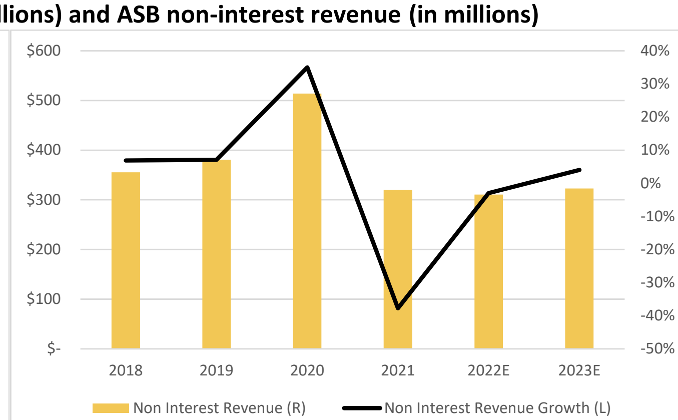


Source: Factset

ASB makes the majority of their income on its interest bearing products, so the large decrease in interest revenue in 2020 significantly hurt its total sales. As seen in figure 17, ASB's net interest margin has been declining since 2018 but with increased interest rates, I anticipate NIM to grow, further boosting revenue growth.

Figure 18 & 19: ASB non-interest revenue to interest revenue (in millions) and ASB non-interest revenue (in millions)





Source: Company Reports, IMCP

As seen in figure 19, non-interest revenue grew 35% to $514 million in 2020, which was caused by a large disposition of its wealth management subsidiary. In 2021, non-interest revenue returned to previous levels, where I anticipate it will continue to slowly grow. While non-interest revenue is an important part of Associated Banc-Corp's business, its shift to focusing on expanding lending capabilities will provide much more upside.

Return on Equity

Associated Banc-Corp's ROE relative to comps (Midwest regional banks) is 1.4% below the average. The net income to sales ratio in 2021 is ~6% higher than 2020 due to $80 million in written off loans being recovered. I expect the net income to sales ratio to decline in 2022, dropping the ROE to 7.1%. I forecasted a growth in net income to sales in 2023, because of the aforementioned interest rate increases and declining expenses, which will bring the ROE back up to 7.7%.

Figure 20: ROE breakdown, 2018-2023E

3-stage	2018	2019	2020	2021E	2022E	2023E
Net income / sales	22.1%	21.0%	21.5%	27.8%	23.7%	25.8%
Sales / avg assets	0.05	0.05	0.04	0.03	0.03	0.03
ROA	1.0%	1.0%	0.9%	0.9%	0.8%	0.8%
Avg assets / avg equity	9.14	8.57	8.21	8.55	8.99	9.08
ROE	9.5%	8.5%	7.7%	8.1%	7.1%	7.7%

Source: Company Filings

Free Cash Flow

Figure 21: Free cash flow calculations

Free Cash Flow	2017	2018	2019	2020	2021E	2022E	2023E
NOPAT	$229	$334	$327	$307	$320	$274	$311
Growth		*45.5%*	*-2.0%*	*-6.1%*	*4.3%*	*-14.3%*	*13.3%*
NOWC	4,704	5,632	5,182	3,714	3,300	3,984	4,598
Net fixed assets	2,602	2,961	2,960	2,971	3,100	3,119	3,244
Total net operating capital	$7,305	$8,593	$8,142	$6,685	$6,400	$7,103	$7,842
Growth		*17.6%*	*-5.2%*	*-17.9%*	*-4.3%*	*11.0%*	*10.4%*
- Change in NOWC		929	(450)	(1,469)	(414)	684	614
- Change in NFA		359	(1)	11	129	19	125
FCFF		-$954	$778	$1,764	$605	-$428	-$428
Growth			*-181.5%*	*126.8%*	*-65.7%*	*-170.8%*	*0.0%*
- After-tax interest expense		64	64	19	64	58	65
+ Net new short-term and long-term debt		689	(640)	(1,548)	18	500	500
FCFE		-$330	$74	$197	$559	$14	$6
Growth			*-122.4%*	*165.8%*	*183.6%*	*-97.5%*	*-54.6%*
Sources of cash (FCFE)		-$330	$74	$197	$559	$14	$6
Uses of cash							
Other expense		$0	$0	$0	$0	$0	$0
Increase mkt sec		-	-	-	-	-	-
Dividends		116	127	130	122	122	122
Change in other equity		(326)	59	8	489	(0)	0
		($210)	$186	$138	$611	$122	$122
Change in other liab		56	47	(78)	(12)	50	50
Total		($266)	$138	$216	$623	$72	$72

Source: Company Fillings, IMCP

ASB's free cash flow has been volatile the past few years due to asset sales. NOPAT has been relatively stable since 2018, but I am expecting a 14.3% decline in 2022 based on no recovery of prior reserves and modest loan losses. I have forecasted an increase in net operating working capital for the next two years due to increased lending opportunities which will bring in more revenue. In order to continue to fund ASB's expected growth, I have forecast new debt each year, so FCFE is about zero.

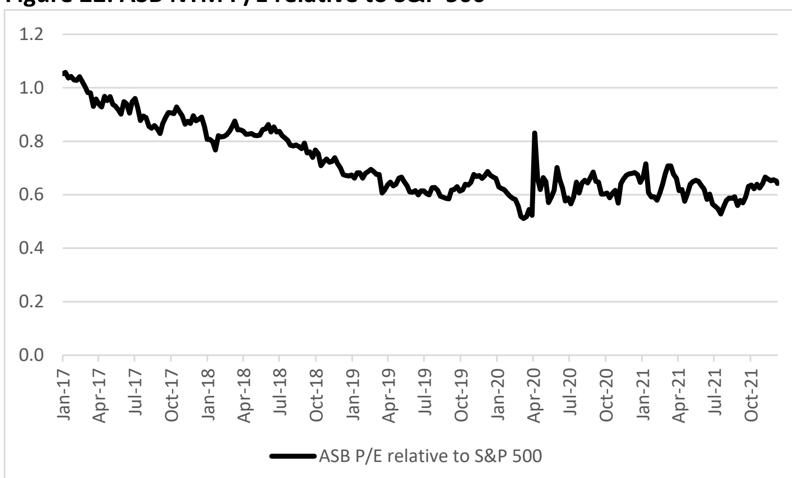
Valuation

ASB was valued using multiples and a 3-stage discounting cash flow model. Based on earnings multiples, the stock is undervalued and is worth $24.64. Relative valuation shows ASB to be slightly undervalued based on its fundamentals versus other Midwest regional banks. Price to book valuation yielded a price of $22.06. A detailed DCF analysis values ASB slightly lower, at $21.04. Based on these valuations, I believe the firm is worth $23.

Trading History

ASB is currently trading at a low P/E relative to the S&P 500, but there has been a climb over the past six months. This is the result of optimism about future interest rates, which is expected to increase in 2022. ASB's current NTM P/E is at 13.6 compared to its five-year average of 13.2. ASB has been on a steady decline from 18.6 five years ago, reaching as low as 6.2 in 2020.

Figure 22: ASB NTM P/E relative to S&P 500



Source: FactSet

Assuming the firm maintains a 13 NTM P/E at the end of 2022, it should trade at $27.30 by the end of the year:

- Price = P/E x EPS = 13 x $2.10 2023EPS = $27.30.

Discounting $27.30 back to today at a 10.8% cost of equity (explained in Discounted Cash Flow section) yields a price of $24.64. Considering ASB is currently trading at ~$24, this valuation indicates that the stock is slightly undervalued.

Relative Valuation

Associated Banc-Corp is trading at a P/E lower than its peers. ASB's TTM P/E is 10.4, which is the second lowest P/E and 0.9 less than the average of 11.7. Associated Banc-Corp has the highest dividend yield, which is 3.47%, or 1.43% higher than the average. P/S for ASB is right in line with the average of comps, and P/B is the lowest out of all the firms, or 0.25 less than the average.

Figure 23: ASB comparable companies

Ticker	Name	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2020	2021	2022	2023	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
ASB	ASSOCIATED BANC-CORP	$23.97	$3,587	2.6	(3.7)	6.7	13.3	10.7	6.1	7.0	-21.1%	-39.6%	82.4%	-20.7%	23.3%		1.03	49.2%	B	3.20%	34.9%
WTFC	WINTRUST FINANCIAL CORP	$96.73	$5,537	4.1	(2.1)	8.2	23.5	24.3	6.5		-11.0%	-22.4%	62.0%	-10.8%	17.5%		1.44	57.3%	A	1.28%	16.3%
UMBF	UMB FINANCIAL CORP	$101.47	$4,913	2.1	(1.2)	(3.5)	6.2	10.4	(4.4)	6.0	-0.1%	22.6%	18.8%	-0.4%	7.7%		0.96	10.4%	B+	1.35%	19.0%
ONB	OLD NATIONAL BANCORP	$17.27	$5,098	1.8	(6.4)	(3.5)	4.4	(11.7)	(4.7)		-6.9%	3.4%	15.3%	-9.8%	20.5%		0.73	76.1%	A-	3.06%	33.5%
FNB	F N B CORP/FL	$12.93	$4,566	1.5	(3.5)	7.9	13.8	1.6	6.6	6.0	-5.4%	-18.6%	29.2%	-6.5%	14.7%		1.05	16.0%	B+	3.57%	39.2%
NCBS	NICOLET BANKSHARES INC	$95.40	$1,291	2.0	0.0	9.7	29.9	13.4	11.3		25.8%	3.3%	15.3%	5.3%	7.4%		0.62	23.2%		0.00%	0.0%
Average			$4,165	2.4	(2.8)	4.3	15.2	8.1	3.6	6.3	-3.1%	-8.5%	37.1%	-7.2%	15.2%		0.97	38.7%		2.08%	23.8%
Median			$4,739	2.1	(2.8)	7.3	13.6	10.5	6.3	6.0	-6.2%	-7.7%	24.0%	-8.1%	16.1%		0.99	36.2%		2.21%	26.3%
SPX	S&P 500 INDEX	$4,543		0.5	3.6	(3.9)	2.0	16.2	(4.7)			-15.3%	49.1%	9.2%	5.1%						

Ticker	Website	2021 ROE	P/B	P/E 2019	2020	2021	TTM	NTM	2022	2023	2021 NPM	2021 P/S	NM	OM	ROIC	EV/ EBIT	P/CF Current	Sales Growth NTM	STM	Pst 5yr	Book Equity
ASB	http://www.associatedbank.com	8.5%	0.93	11.2	14.4	10.4	11.0	13.9	13.9	11.3	30.5%	3.37	31.1%		5.9%	-	9.9	2.2%	11.3%		$25.66
WTFC	http://www.wintrust.com	10.6%	1.35	11.8	13.0	12.0	12.7	14.3	14.3	12.2	25.4%	3.24	24.4%		7.1%	-	14.2	-5.8%	10.2%		$71.62
UMBF	http://www.umbfinancial.com	11.2%	1.56	13.8	11.3	14.6	14.0	14.0	14.0	13.0	27.4%	3.83	26.5%		10.3%	-	9.5	3.8%	5.5%		$64.95
ONB	http://www.oldnational.com	9.5%	0.95	12.6	11.0	10.5	10.3	11.1	11.1	9.2	62.3%	6.22	32.5%		5.3%	-	9.2	66.5%	17.1%		$18.21
FNB	http://www.fnb-online.com	7.8%	0.82	10.8	9.9	9.8	10.5	11.2	11.1	9.7	35.4%	3.69	30.4%		6.9%	-	9.3	-0.2%	8.0%		$15.81
NCBS	http://www.nicoletbank.com	10.3%	1.50	13.4	11.9	12.9	17.3	13.8	13.8	12.8	39.5%	5.73	25.4%		7.2%	-	14.8				$63.73
Average		9.6%	1.18	12.2	11.9	11.7	12.7	13.1	13.0	11.4	36.7%	4.35	28.4%		7.1%	-	11.1	13.3%	10.4%		
Median		9.9%	1.15	12.2	11.6	11.3	11.9	13.9	13.9	11.7	33.0%	3.76	28.4%		7.0%	-	9.7	2.2%	10.2%		
SPX	S&P 500 INDEX			19.8	27.0	23.2			20.2	19.2											

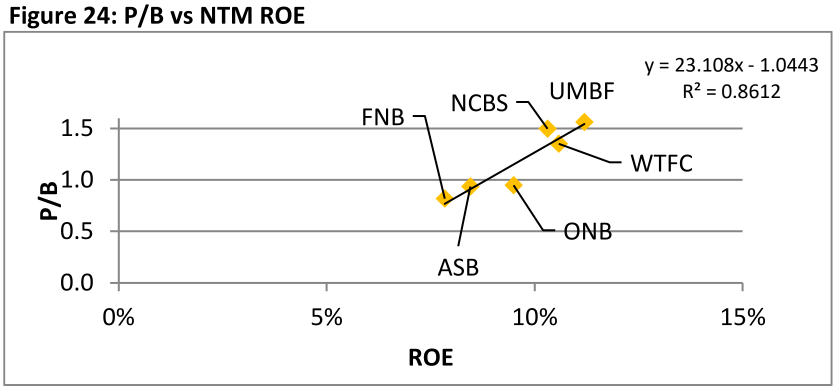
Source: FactSet, IMCP

A more thorough analysis of P/B and ROE is shown in figure 24. The calculated R-squared of the regression indicates that over 86% of a sampled firm's P/B is explained by its NTM ROE. ASB has the lowest P/B and second lowest ROE of this grouping, and according to this measure is slightly undervalued.

- Estimated P/B = 2021 ROE (8.5%) x 23.108 - 1.0443 = 0.920
- Target Price = Estimated P/B (0.920) x 2022E BVPS (26.56) = $24.44

Discounting back to the present at a 10.8% cost of equity leads to a target price of $22.06 using this metric.

Figure 24: P/B vs NTM ROE



Source: Factset

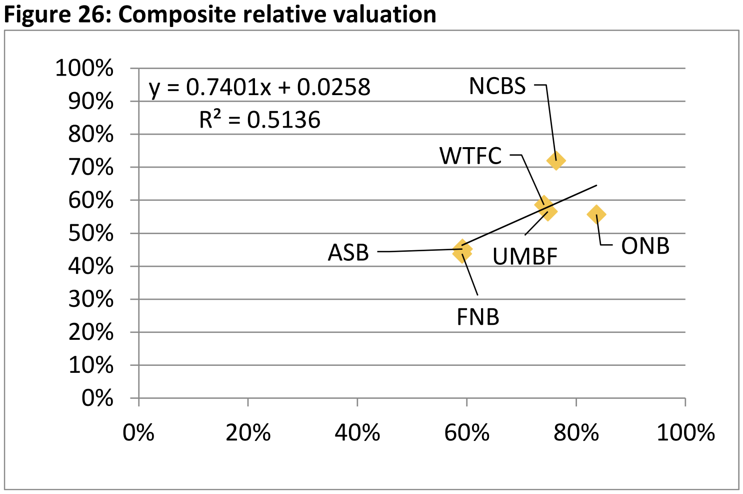
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. The regression line had an R-squared of 0.5136. One can see that ASB is below the regression line, so based on this fundamental, ASB is slightly undervalued.

Figure 25: Composite valuation, % of range

							Fundamentals			Valuation			
						Weight	20.0%	40.0%	40.0%	25.0%	25.0%	25.0%	25.0%
		Rank		Target	Weighted		1/	2021	2021				Div
Ticker	Name	Diff	Diff	Value	Fund	Value	Payout	ROE	NPM	P/B	P/S	P/CF	Yield
ASB	ASSOCIATED BANC-CORP	3	1%	46%	59%	45%	47%	76%	49%	60%	54%	67%	40%
WTFC	WINTRUST FINANCIAL CORP	2	-1%	57%	74%	59%	100%	95%	41%	86%	52%	96%	100%
UMBF	UMB FINANCIAL CORP	4	1%	58%	75%	57%	86%	100%	44%	100%	62%	65%	94%
ONB	OLD NATIONAL BANCORP	6	9%	65%	84%	56%	49%	85%	100%	61%	100%	62%	42%
FNB	F N B CORP/FL	5	3%	46%	59%	44%	42%	70%	57%	52%	59%	63%	36%
NCBS	NICOLET BANKSHARES INC	1	-13%	59%	76%	72%	71%	92%	63%	96%	92%	100%	68%

Source: IMCP

Figure 26: Composite relative valuation



Source: IMCP

<u>Discounted Cash Flow Analysis</u>

A three-stage discounted cash flow model was also used to value ASB.

For the purpose of this analysis, the company's cost of equity was calculated to be 12.1% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk-free rate, as represented by the ten-year Treasury bond yield, is 1.60%.
- A ten-year beta of 1.1 was utilized since the company has slightly higher risk than the market.
- A long-term market rate of return of 10% was assumed, since historically, the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 10.8% (1.60 + 1.1 (10.0 – 1.60)).

Stage One - The model's first stage simply discounts fiscal years 2022 and 2023 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $0.09 and $0.04, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $0.12 per share. Thus, stage one of this discounted cash flow analysis contributes $0.12 to value.

Stage Two - Stage two of the model focuses on fiscal years 2024 to 2028. During this period, FCFE is calculated based on revenue growth, NOPAT margin, and capital growth assumptions. The resulting cash flows are then discounted using the company's 10.8% cost of equity. I assume stable sales growth figures through 2024 to 2028. My estimates for sales growth as follow: 2024 -> 5%, 2025 -> 5%, 2026 -> 4.5%, 2027 -> 4.5%, 2028 -> 4.5%. The NFA turnover ratio will remain at 2021 levels, but NOPAT margin is expected to increase to 29.0% in 2028 from 27.8% in 2021, due to incremental revenues from higher interest rates.

Figure 27: FCFE and discounted FCFE, 2022 – 2028

	First Stage		Second Stage				
Year ending January	2022	2023	2024	2025	2026	2027	2028
FCFE	$0.09	$0.04	$2.43	$2.64	$0.83	$0.86	$0.90
Discounted FCFE	$0.08	$0.03	$1.78	$1.75	$0.49	$0.47	$0.44

Source: IMCP

Added together, these discounted cash flows total $4.93.

Stage Three – Net income for the years 2024 – 2028 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $2.11 in 2021 to $2.35 in 2028.

Figure 28: EPS estimates for 2021 – 2028

	2021	2022	2023	2024	2025	2026	2027	2028
EPS	$2.11	$1.80	$2.04	$1.88	$2.06	$2.15	$2.25	$2.35

Source: IMCP

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. The stock's TTM P/E is 10.4, which is lower than the peer average of 11.7 (see figure 23). Its P/E has also declined versus the market over the past five years (see figure 22). By 2028, margins will be back to 2021 levels and growth should stabilize. Assuming a normal market P/E of 15 with banks still trading at a discount to the S&P 500, and ASB being a small sized regional bank, a P/E of 14 is warranted.

Given the assumed terminal earnings per share of $2.35 and a price to earnings ratio of 14, a terminal value of $32.88 per share is calculated. Using the 10.8% cost of equity, this number is discounted back to a present value of $16.00.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $21.05 is calculated (0.12 + 4.93 + 16.00). Given ASB's current price of $22.11, this model indicates that the stock is slightly overvalued.

<u>Scenario Analysis</u>

Due to the cyclical nature of the banking industry, valuations are prone to significant fluctuations. In order to understand how ASB will perform in different market conditions, I adjusted my DCF model assumptions for a bear and a bull scenario. In each of these scenarios, I adjusted the beta and terminal P/E. For the bull case scenario, the beta and P/E were adjusted to 1 and 20, respectively. This scenario yielded a target price of $29.31. For the bear case, I adjusted the beta and P/E to 1.3 and 8, respectively, and had a target price of $12.97.

Figure 29: Bull case

Summary (using P/E multiple for terminal value)		
First stage	$0.12	Present value of first 2 year cash flow
Second stage	$5.09	Present value of year 3-7 cash flow
Third stage	$24.10	Present value of terminal value P/E
Value (P/E)	**$29.31**	

Figure 30: Bear case

Summary (using P/E multiple for terminal value)		
First stage	$0.11	Present value of first 2 year cash flow
Second stage	$4.63	Present value of year 3-7 cash flow
Third stage	$8.23	Present value of terminal value P/E
Value (P/E)	**$12.97**	

Business Risks

Changes in tax laws:
There is a bill in Congress that contains a proposal for a new corporate tax rate of 26.5%, a 5.5% increase from the current rate. Other task risks include changes in loss carry forwards, changes in gain/loss recognition, and changes in interest expense write-offs. While only the new rate is being proposed, tax laws are always changing and can significantly hinder returns.

Cyberattacks:
With ASB shifting more towards technology, cyberattacks can be detrimental to business operations. Mobile banking is convenient for customers, but if ASB lacks proper security, the large investments to mobile banking will be futile. Also, with increased internal reliance on technology, and having an all-in-one customer relationship management, outages can lose business.

Market conditions:
ASB is a highly cyclical company and has historically struggled during economic downturns. When interest rates are low, ASB revenues suffer. Interest rates can be unpredictable, so its vital that Associated Banc-Corp is disciplined with the balance sheet and doesn't overspend before an economic downturn.

Lending growth:
As mentioned earlier, ASB has substantial deposits and a higher loan to deposits ratio than competitors. It's important that the loan balance increases in the coming years, or else ASB interest expense could rise without a corresponding increase in interest revenue, effectively driving down margins.

New Strategy Execution:
ASB has been shifting its focus on expanding lending capabilities, while selling off less profitable businesses. While I mentioned that as a driver, there is a risk that the new strategy doesn't work as well as planned. Also with an increased reliance on interest rates, ASB is more susceptible to very bad years when interest rates are low.

Appendix 1: Porter's 5 Forces

<u>Threat of New Entrants – Low</u>

The banking industry has large barriers to entry because competition, capital investments, and regulation. ASB is an established bank, and new entrants would struggle to compete with its services.

<u>Threat of Substitutes – High</u>

Although ASB is working on improving its mobile banking and technology, large national banks have already made it the standard. Associated Banc-Corp needs to continue to compete with the large banks' services in order to retain its customer base.

<u>Supplier Power – Medium</u>

Associated Banc-Corp requires deposits from customers to fund its lending business, but depositors also need banks to store their savings.

<u>Buyer Power – High</u>

Associated Banc-Corp primarily does business in Wisconsin and the surrounding states. With Wisconsin being the headquarters of many industrial companies, ASB is looking to provide more value to those firms through its new Equipment Finance vertical. This new product caters to industrial companies by helping plants acquire heavy machinery.

<u>Intensity of Competition – Very High</u>

ASB's largest competition is from larger national banks, like US Bank and Chase Bank, which both have large offices in Milwaukee. Associated Banc-Corp has deep roots in Wisconsin communities, which keeps its services competitive with large firms.

Appendix 2: SWOT Analysis

Strengths	Weakness
Deep roots Wisconsin Ability to explore new markets	Limited success outside core business Gaps in products for customers
Opportunities	**Threats**
Expanding lending products Expanding to more Midwest states	Interest rate risks Competition

Appendix 3: Sales Forecast

Sales						BaseCase		Bull Case		Bear Case	
Items	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**	**Dec-22**	**Dec-23**	**Dec-22**	**Dec-23**	**Dec-22**	**Dec-23**
Sales	1,219	$1,510	1,553	$1,427	1,150	1,157	$1,203	$1,157	$1,203	$1,157	$1,203
Growth		*23.8%*	*2.9%*	*-8.1%*	*-19.4%*	*0.6%*	*4.0%*	*0.6%*	*4.0%*	*0.6%*	*4.0%*
Interest Income	887	1,154	1,173	913	830	847	880	847	880	847	880
Growth		*30.2%*	*1.6%*	*-22.2%*	*-9.1%*	*2.0%*	*4.0%*	*2.0%*	*4.0%*	*2.0%*	*4.0%*
% of sales	*72.7%*	*76.4%*	*75.5%*	*64.0%*	*72.2%*	*73.2%*	*73.2%*	*73.2%*	*73.2%*	*73.2%*	*73.2%*
Noninterest Income	333	356	381	514	320	310	323	310	323	310	323
Growth		*6.9%*	*7.1%*	*35.0%*	*-37.7%*	*-3.0%*	*4.0%*	*-3.0%*	*4.0%*	*-3.0%*	*4.0%*
% of sales	*27.3%*	*23.6%*	*24.5%*	*36.0%*	*27.8%*	*2.0%*	*26.8%*	*26.8%*	*26.8%*	*26.8%*	*26.8%*

Appendix 4: Income Statement

Income Statement							
Items	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**	**Dec-22**	**Dec-23**
Interest Income	$887	$1,154	$1,173	$913	$830	$847	$880
Non-interest Income	333	356	381	514	320	310	323
Sales	$1,219	$1,510	$1,553	$1,427	$1,150	$1,157	$1,203
Interest	145	275	337	150	80	85	91
Provision for loan losses	26	-	16	174	(80)	13	14
Net interest income after provision	1,048	1,235	1,200	1,103	1,150	1,060	1,099
Non-interest expense	709	822	794	776	750	713	705
EBT	339	413	407	327	400	347	393
Taxes	110	80	80	20	80	73	83
Income	229	334	327	307	320	274	311
Other	-	-	-	-	-	-	-
Net income	229	334	327	307	320	274	311
Basic Shares	151	167	161	153	152	152	152
Fully Diluted Shares	154	170	162	154	153	153	153
EPS	$1.52	$1.99	$2.04	$2.00	$2.11	$1.80	$2.04
EPS Fully Diluted	$1.49	$1.97	$2.02	$2.00	$2.09	$1.79	$2.03
DPS	$0.57	$0.69	$0.79	$0.85	$0.80	$0.80	$0.80

Appendix 5: Balance Sheet

Balance Sheet							
Items	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**	**Dec-22**	**Dec-23**
Cash	484	507	373	416	370	418	288
Loans	20,605	22,782	22,756	24,197	23,800	25,228	27,246
Operating assets ex cash and loans	6,794	7,398	6,297	5,835	6,800	6,841	7,115
Operating assets	27,882	30,687	29,426	30,448	30,970	32,487	34,649
Interest-bearing demand deposits	17,308	19,199	18,328	18,821	19,600	20,384	21,607
Operating liabilities ex deposits	5,871	5,856	5,916	7,914	8,070	8,119	8,444
NOWC	4,704	5,632	5,182	3,714	3,300	3,984	4,598
NOWC ex cash (NWC)	4,220	5,125	4,809	3,298	2,930	3,566	4,310
NFA	2,602	2,961	2,960	2,971	3,100	3,119	3,244
Invested capital	*$7,305*	*$8,593*	*$8,142*	*$6,685*	*$6,400*	*$7,103*	*$7,842*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$30,484*	*$33,648*	*$32,386*	*$33,420*	*$34,070*	*$35,606*	*$37,893*
S-T and L-T debt and financing leases	$3,681	$4,370	$3,730	$2,182	$2,200	$2,700	$3,200
Other liabilities	386	$443	490	412	400	450	500
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	3,237	$3,781	3,922	4,091	3,800	3,953	4,142
Total supplied capital	*$7,305*	*$8,593*	*$8,142*	*$6,685*	*$6,400*	*$7,103*	*$7,842*
Total liabilities and equity	*$30,484*	*$33,648*	*$32,386*	*$33,420*	*$34,070*	*$35,606*	*$37,893*

Appendix 6: Ratios

Ratios	Dec-17	Dec-18	Dec-19	Dec-20	Dec-21	Dec-22	Dec-23
Profitability							
Gross margin	85.9%	81.8%	77.3%	77.3%	100.0%	91.6%	91.3%
Operating (EBIT) margin	27.8%	27.4%	26.2%	22.9%	34.8%	30.0%	32.7%
Net profit margin	18.8%	22.1%	21.0%	21.5%	27.8%	23.7%	25.8%
Activity							
NFA (gross) turnover		0.54	0.52	0.48	0.38	0.37	0.38
Total asset turnover		0.05	0.05	0.04	0.03	0.03	0.03
Liquidity							
Op asset / op liab	4.75	5.24	4.97	3.85	3.84	4.00	4.10
NOWC Percent of sales		342.3%	348.1%	311.7%	304.9%	314.8%	356.6%
Solvency							
Debt to assets	12.1%	13.0%	11.5%	6.5%	6.5%	7.6%	8.4%
Debt to equity	113.7%	115.6%	95.1%	53.3%	57.9%	68.3%	77.3%
Other liab to assets	1.3%	1.3%	1.5%	1.2%	1.2%	1.3%	1.3%
Total debt to assets	13.3%	14.3%	13.0%	7.8%	7.6%	8.8%	9.8%
Total liabilities to assets	32.6%	31.7%	31.3%	31.4%	31.3%	31.6%	32.0%
Debt to EBIT	10.87	10.57	9.18	6.67	5.50	7.78	8.14
EBIT/interest	3.09	5.18	5.10	16.19	5.00	4.76	4.76
Debt to total net op capital	50.4%	50.9%	45.8%	32.6%	34.4%	38.0%	40.8%
ROIC							
NOPAT to sales	18.8%	22.1%	21.0%	21.5%	27.8%	23.7%	25.8%
Sales to NWC		0.32	0.31	0.35	0.37	0.36	0.31
Sales to NFA		0.54	0.52	0.48	0.38	0.37	0.38
Sales to IC ex cash		0.20	0.20	0.20	0.19	0.18	0.17
Total ROIC ex cash		4.5%	4.1%	4.4%	5.2%	4.3%	4.4%
NOPAT to sales	18.8%	22.1%	21.0%	21.5%	27.8%	23.7%	25.8%
Sales to NOWC		0.29	0.29	0.32	0.33	0.32	0.28
Sales to NFA		0.54	0.52	0.48	0.38	0.37	0.38
Sales to IC		0.19	0.19	0.19	0.18	0.17	0.16
Total ROIC		4.2%	3.9%	4.1%	4.9%	4.1%	4.2%
NOPAT to sales	18.8%	22.1%	21.0%	21.5%	27.8%	23.7%	25.8%
Sales to EOY NWC	0.29	0.29	0.32	0.43	0.39	0.32	0.28
Sales to EOY NFA	0.47	0.51	0.52	0.48	0.37	0.37	0.37
Sales to EOY IC ex cash	0.18	0.19	0.20	0.23	0.19	0.17	0.16
Total ROIC using EOY IC ex cash	3.4%	4.1%	4.2%	4.9%	5.3%	4.1%	4.1%
NOPAT to sales	18.8%	22.1%	21.0%	21.5%	27.8%	23.7%	25.8%
Sales to EOY NOWC	0.26	0.27	0.30	0.38	0.35	0.29	0.26
Sales to EOY NFA	0.47	0.51	0.52	0.48	0.37	0.37	0.37
Sales to EOY IC	0.17	0.18	0.19	0.21	0.18	0.16	0.15
Total ROIC using EOY IC	3.1%	3.9%	4.0%	4.6%	5.0%	3.9%	4.0%
ROE							
5-stage							
EBIT / sales		27.4%	26.2%	22.9%	34.8%	30.0%	32.7%
Sales / avg assets		0.05	0.05	0.04	0.03	0.03	0.03
EBT / EBIT		33.5%	33.9%	29.6%	34.8%	32.8%	35.8%
Net income /EBT		80.7%	80.4%	93.8%	80.0%	79.0%	79.0%
ROA		0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Avg assets / avg equity		9.14	8.57	8.21	8.55	8.99	9.08
ROE		3.2%	2.9%	2.3%	2.8%	2.3%	2.7%
3-stage							
Net income / sales		22.1%	21.0%	21.5%	27.8%	23.7%	25.8%
Sales / avg assets		0.05	0.05	0.04	0.03	0.03	0.03
ROA		1.0%	1.0%	0.9%	0.9%	0.8%	0.8%
Avg assets / avg equity		9.14	8.57	8.21	8.55	8.99	9.08
ROE		9.5%	8.5%	7.7%	8.1%	7.1%	7.7%
Payout Ratio		34.9%	38.9%	42.5%	38.0%	44.3%	39.1%
Retention Ratio		65.1%	61.1%	57.5%	62.0%	55.7%	60.9%
Sustainable Growth Rate		6.2%	5.2%	4.4%	5.0%	3.9%	4.7%

Appendix 7: 3-Stage DCF Model

		Year						
		1	2	3	4	5	6	7
	First Stage			Second Stage				
Year ending January	2021	2022	2023	2024	2025	2026	2027	2028
Sales Growth	*-19.4%*	*0.6%*	*4.0%*	*5.0%*	*5.0%*	*4.5%*	*4.5%*	*4.5%*
NOPAT / S	*27.8%*	*23.7%*	*25.8%*	*28.0%*	*29.0%*	*29.0%*	*29.0%*	*29.0%*
S / NOWC	*0.35*	*0.29*	*0.26*	*0.28*	*0.30*	*0.30*	*0.30*	*0.30*
S / NFA (EOY)	*0.37*	*0.37*	*0.37*	*0.37*	*0.37*	*0.37*	*0.37*	*0.37*
S / IC (EOY)	*0.18*	*0.16*	*0.15*	*0.16*	*0.17*	*0.17*	*0.17*	*0.17*
ROIC (EOY)	*5.0%*	*3.9%*	*4.0%*	*4.5%*	*4.8%*	*4.8%*	*4.8%*	*4.8%*
ROIC (BOY)		*4.3%*	*4.4%*	*4.5%*	*4.9%*	*5.0%*	*5.0%*	*5.0%*
Share Growth	*-0.7%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Sales	$1,150	$1,157	$1,203	$1,263	$1,327	$1,386	$1,449	$1,514
NOPAT	$320	$274	$311	$354	$385	$402	$420	$439
Growth	*4.3%*	*-14.3%*	*13.3%*	*13.9%*	*8.7%*	*4.5%*	*4.5%*	*4.5%*
- Change in NOWC	-414	684	614	-86	-90	199	208	217
NOWC EOY	*3300*	*3984*	*4598*	*4512*	*4422*	*4621*	*4829*	*5046*
Growth NOWC	*-11.1%*	*20.7%*	*15.4%*	*-1.9%*	*-2.0%*	*4.5%*	*4.5%*	*4.5%*
- Chg NFA	129	19	125	162	170	161	168	176
NFA EOY	*3,100*	*3,119*	*3,244*	*3,406*	*3,576*	*3,737*	*3,905*	*4,081*
Growth NFA	*4.3%*	*0.6%*	*4.0%*	*5.0%*	*5.0%*	*4.5%*	*4.5%*	*4.5%*
Total inv in op cap	-285	703	739	76	80	360	376	393
Total net op cap	6400	7103	7842	7918	7998	8358	8734	9127
FCFF	$605	($428)	($428)	$277	$305	$42	$44	$46
% of sales	*52.6%*	*-37.0%*	*-35.6%*	*22.0%*	*23.0%*	*3.0%*	*3.0%*	*3.0%*
Growth		*-170.8%*	*0.0%*	*-164.8%*	*9.8%*	*-86.2%*	*4.5%*	*4.5%*
- Interest (1-tax rate)	64	58	65	69	72	75	79	82
Growth	*237.7%*	*-10.0%*	*13.3%*	*5.0%*	*5.0%*	*4.5%*	*4.5%*	*4.5%*
+ Net new debt	18	500	500	160	168	159	166	173
Debt	2200	2700	3200	3360	3528	3687	3853	4026
Debt / tot net op capital	*34.4%*	*38.0%*	*40.8%*	*42.4%*	*44.1%*	*44.1%*	*44.1%*	*44.1%*
FCFE w debt	$559	$14	$6	$369	$401	$126	$131	$137
% of sales	*48.6%*	*1.2%*	*0.5%*	*29.2%*	*30.2%*	*9.1%*	*9.1%*	*9.1%*
Growth		*-97.5%*	*-54.6%*	*5699.8%*	*8.6%*	*-68.6%*	*4.5%*	*4.5%*
/ No Shares	152.0	152.0	152.0	152.0	152.0	152.0	152.0	152.0
FCFE	$3.68	$0.09	$0.04	$2.43	$2.64	$0.83	$0.86	$0.90
Growth		*-97.5%*	*-54.6%*	*5699.8%*	*8.6%*	*-68.6%*	*4.5%*	*4.5%*
* Discount factor		0.90	0.81	0.73	0.66	0.60	0.54	0.49
Discounted FCFE		$0.08	$0.03	$1.78	$1.75	$0.49	$0.47	$0.44
Terminal value P/E								
Net income	$320	$274	$311	$285	$313	$327	$342	$357
% of sales	*27.8%*	*23.7%*	*25.8%*	*22.6%*	*23.6%*	*23.6%*	*23.6%*	*23.6%*
EPS	$2.11	$1.80	$2.04	$1.88	$2.06	$2.15	$2.25	$2.35
Growth	*5.0%*	*-14.3%*	*13.3%*	*-8.2%*	*9.7%*	*4.5%*	*4.5%*	*4.5%*
Terminal P/E								14.00
* Terminal EPS								$2.35
Terminal value								$32.88
* Discount factor								0.49
Discounted terminal value								$16.00
Summary (using P/E multiple for terminal value)								
First stage	$0.12	Present value of first 2 year cash flow						
Second stage	$4.93	Present value of year 3-7 cash flow						
Third stage	$16.00	Present value of terminal value P/E						
Value (P/E)	**$21.04**							

Cost of equity	
Market return	10.0%
- Risk free rate	1.60%
= Market risk premium	8.4%
* Beta	1.10
= Stock risk premium	9.2%
$r = r_f$+ stock RP	**10.8%**