



# BNY MELLON

## The intersection of Innovation and Trust



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MSc in Financial Risk Management



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MS in Financial Risk Management



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MS in Financial Management



**Ulemj T**

MS in Financial Risk Management

**TEAM Q**  
**CFA Research Challenge - 2023**



# BNY MELLON

## The intersection of Innovation and Trust

- LAST CLOSE
- 12M TARGET PRICE
- RECOMMENDATION

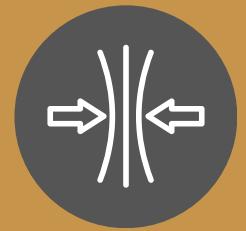
\$50.06

\$62.15

BUY

+24% UPSIDE

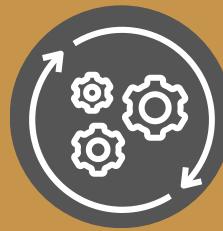
# INVESTMENT SUMMARY



**RESILIENCE &  
STABILITY**



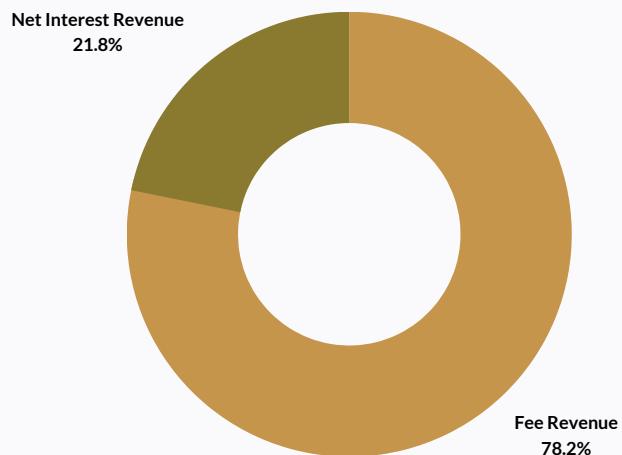
**DIGITAL  
INNOVATION**



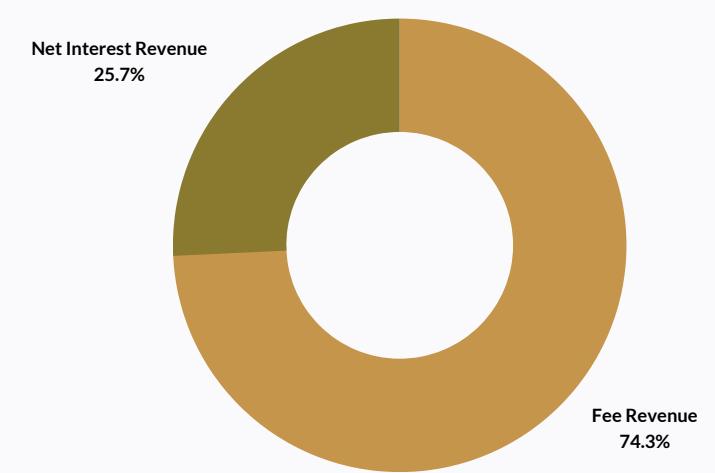
**BUSINESS  
OPTIMIZATION**

# BUSINESS OVERVIEW

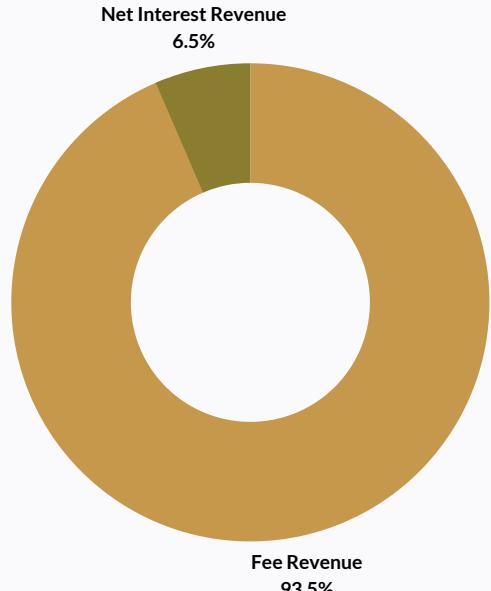
## Securities Services



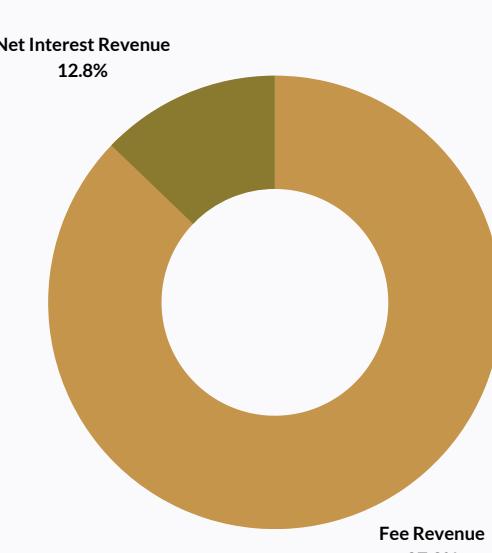
## Market & Wealth Services



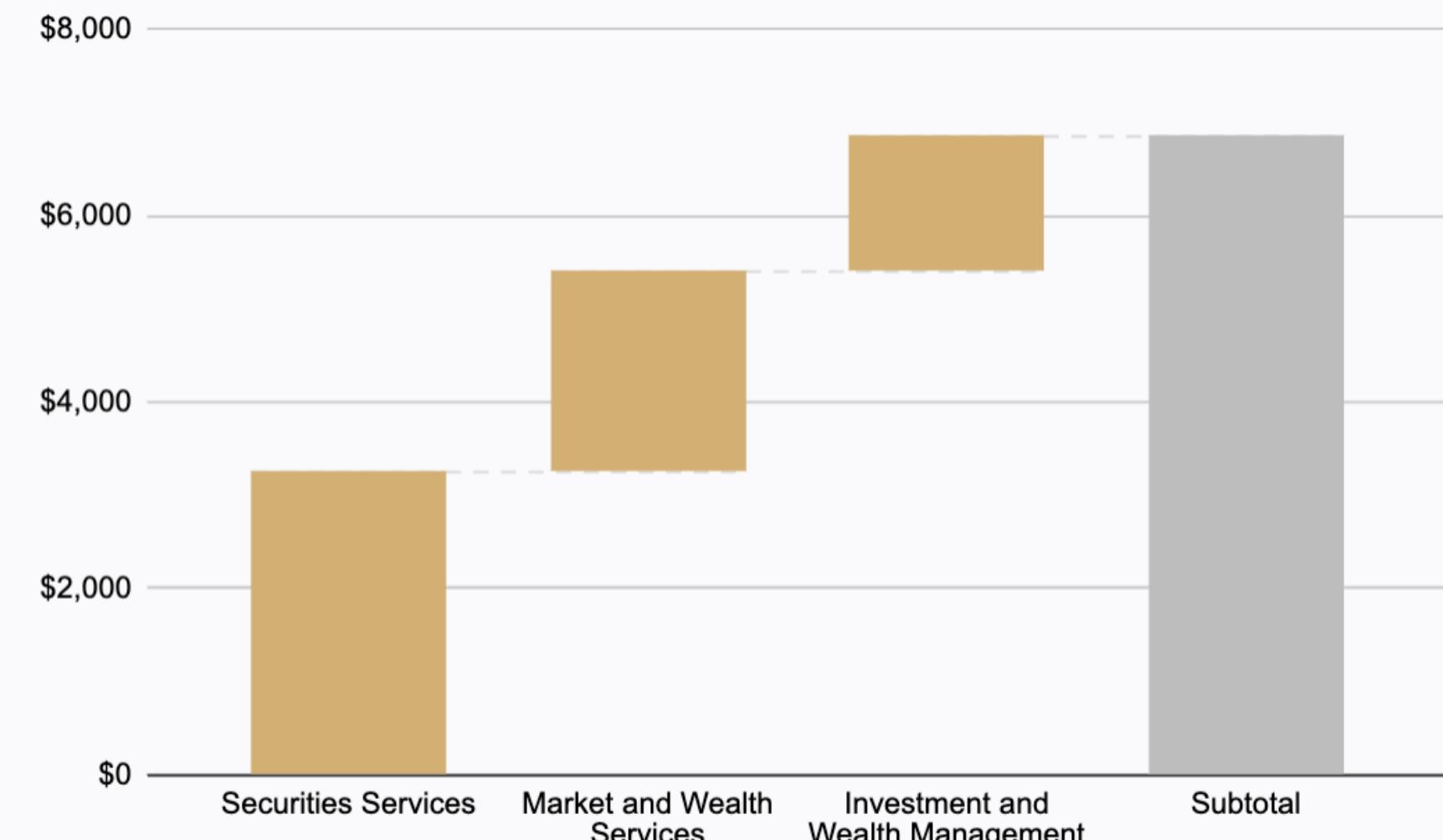
## Investment & Wealth Management



## Other



## Revenue by Segment (\$mm)



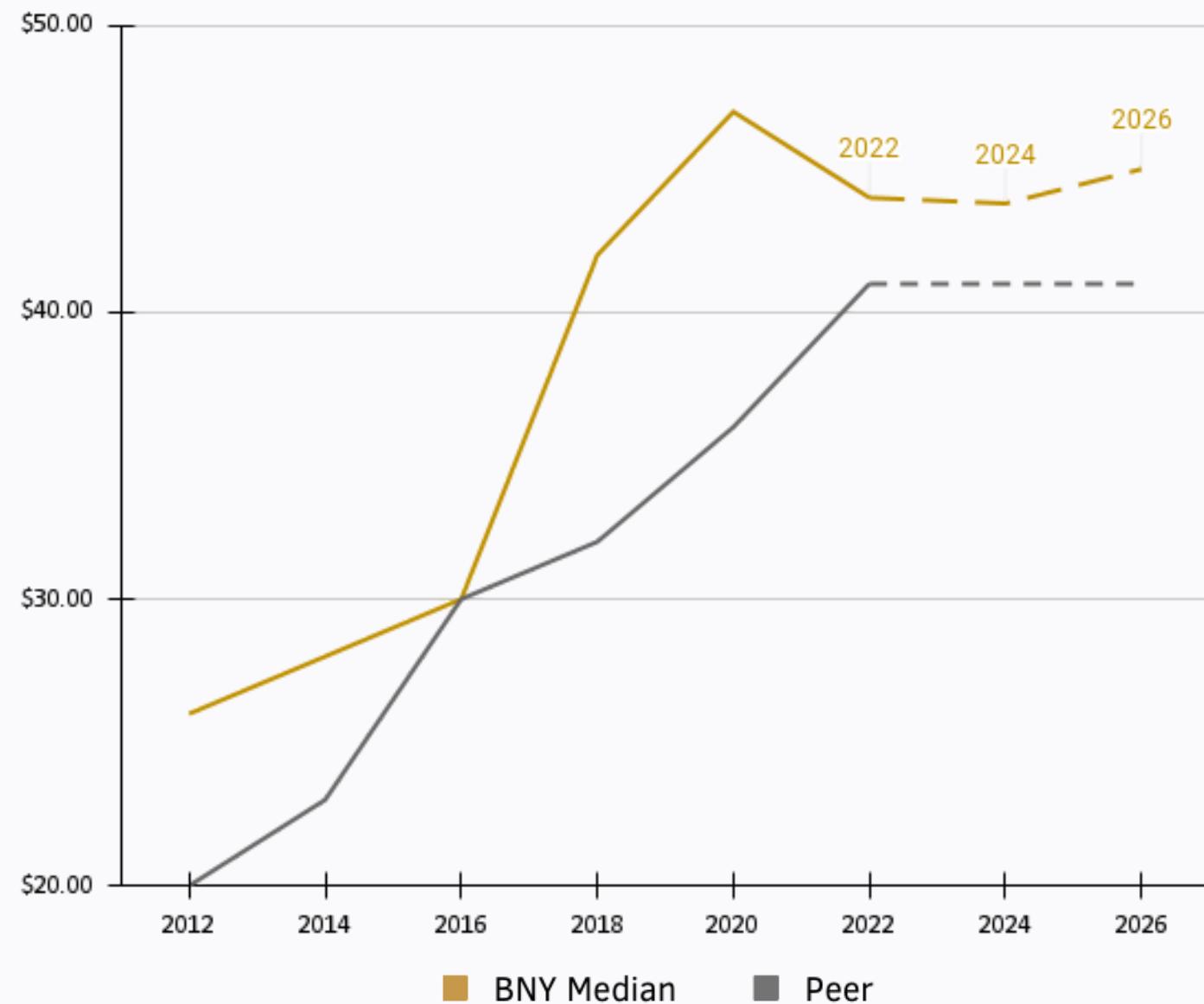
Source: Company Data, Team Analysis

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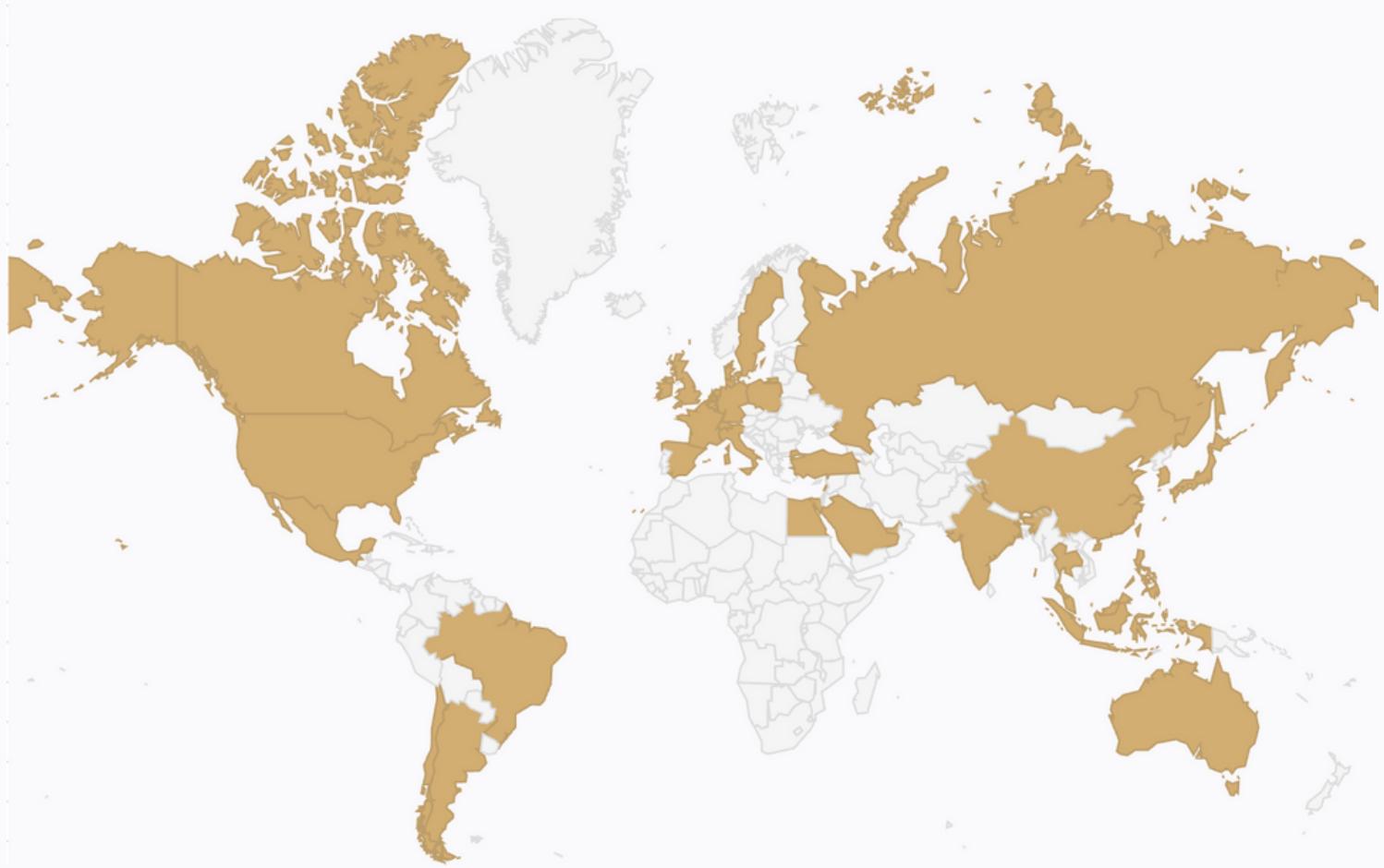


# BUSINESS OVERVIEW

## Assets under Custody/Administration (\$TN)

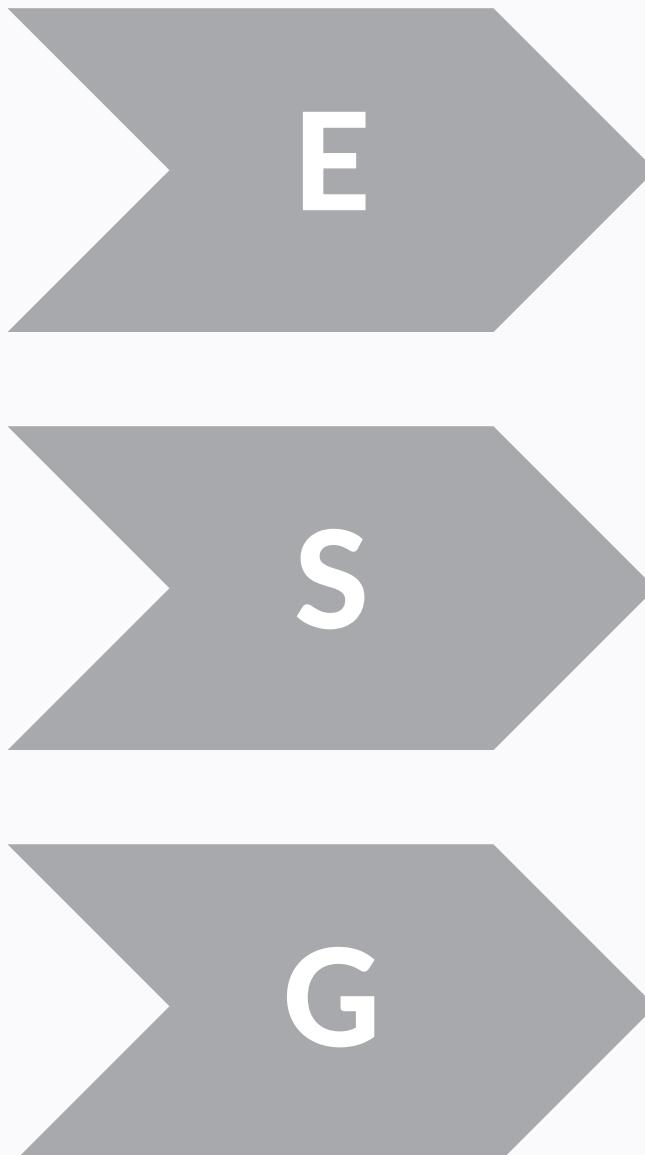


## Global Business Operation



Source: Company Data, Team Analysis

# ENVIRONMENTAL, SOCIAL, AND GOVERNANCE



<b>2015</b> Starting year of BK Carbon Neutrality	<b>\$89 Billion</b> New sustainable, social and Green Bond Issuance in 2021	<b>36%</b> Total reduction in indirect emissions from purchased energy as per 2021
<b>15th</b> Among the top 20 Fortune 500 Companies on Diversity and Inclusion	<b>ISO 27002:2013</b> Re-certified Information Security Management System	<b>\$34.5 Million</b> In Corporate Funding and other giving. \$17.4M in scholarships
<b>27%</b> Board Members from underrepresented racial backgrounds	<b>100%</b> Current employees certified on Code of Conduct provisions	<b>36%</b> Women on Board of Directors

## ESG SCORE SUMMARY

<b>B+</b> ESG Score	<b>B+</b> ESG Controversies Score	<b>B+</b> ESG Combined Score
<b>A</b> Environmental Pillar Score	<b>A-</b> Social Pillar Score	<b>B</b> Governance Pillar Score

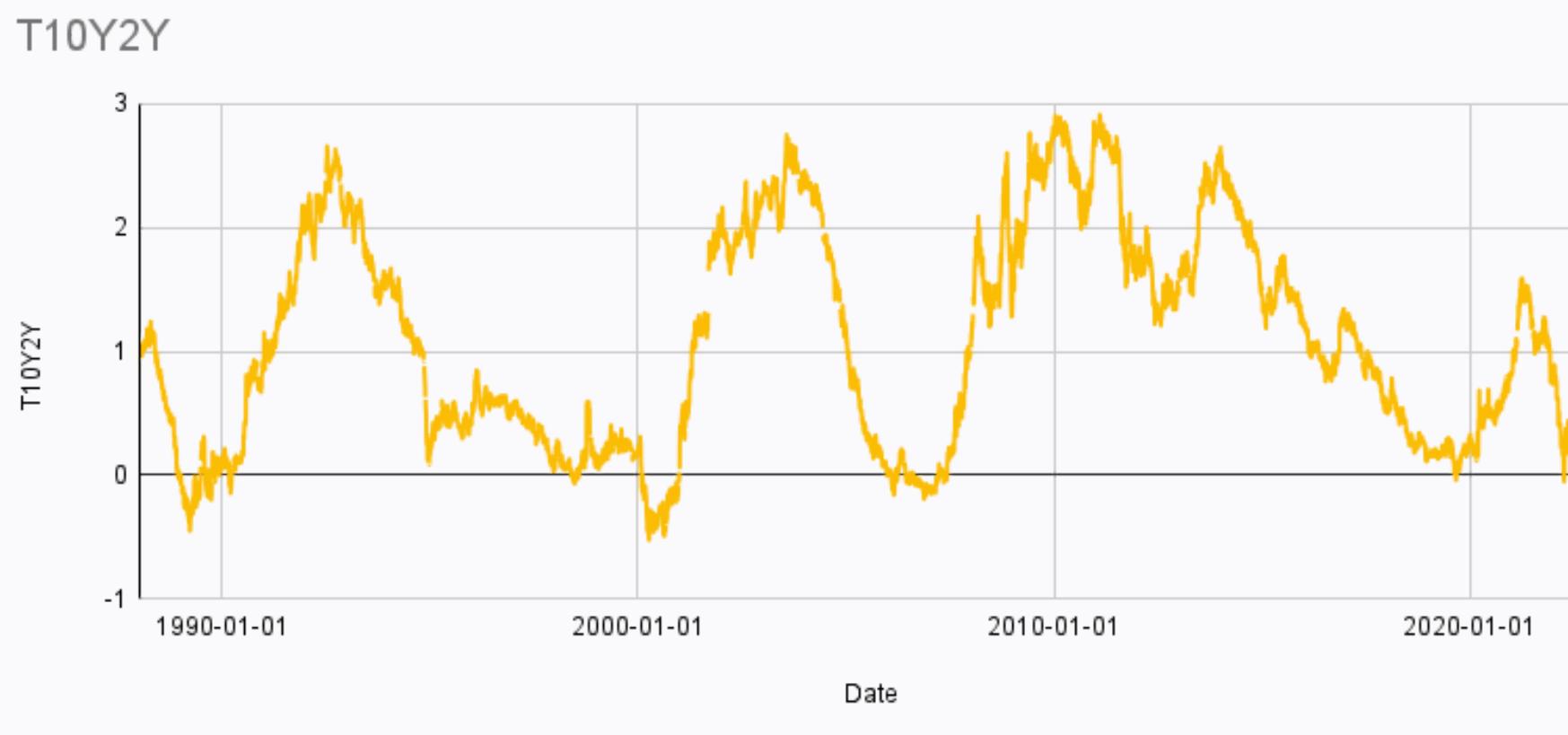
## WOMEN BOARD PARTICIPATION



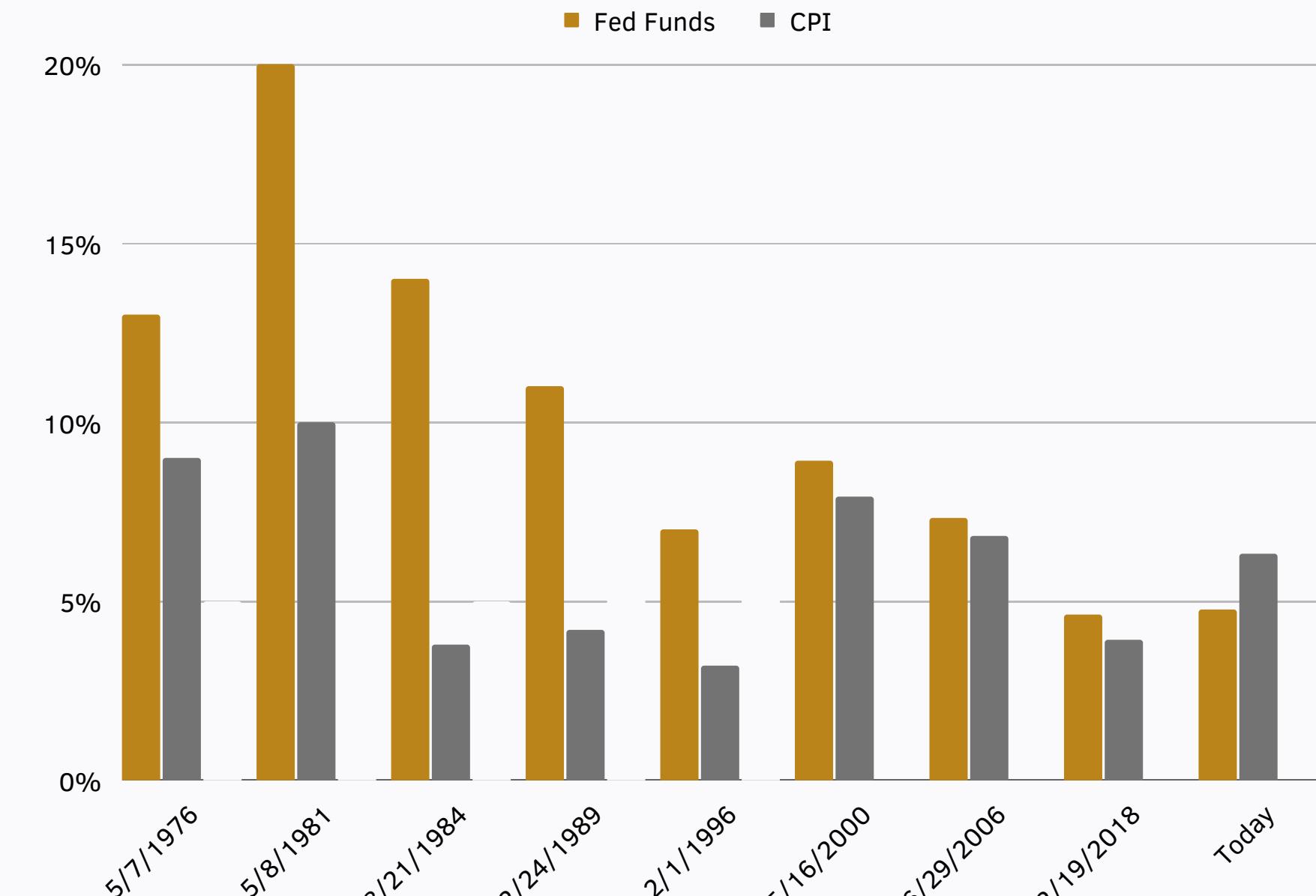
Source: Company Data, Team Analysis

# MARKET OUTLOOK

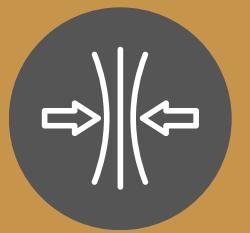
## YIELD CURVE



## FED FUNDS RATE & INFLATION RATE



# INVESTMENT SUMMARY



## RESILIENCE & STABILITY



## DIGITAL INNOVATION



## BUSINESS OPTIMIZATION



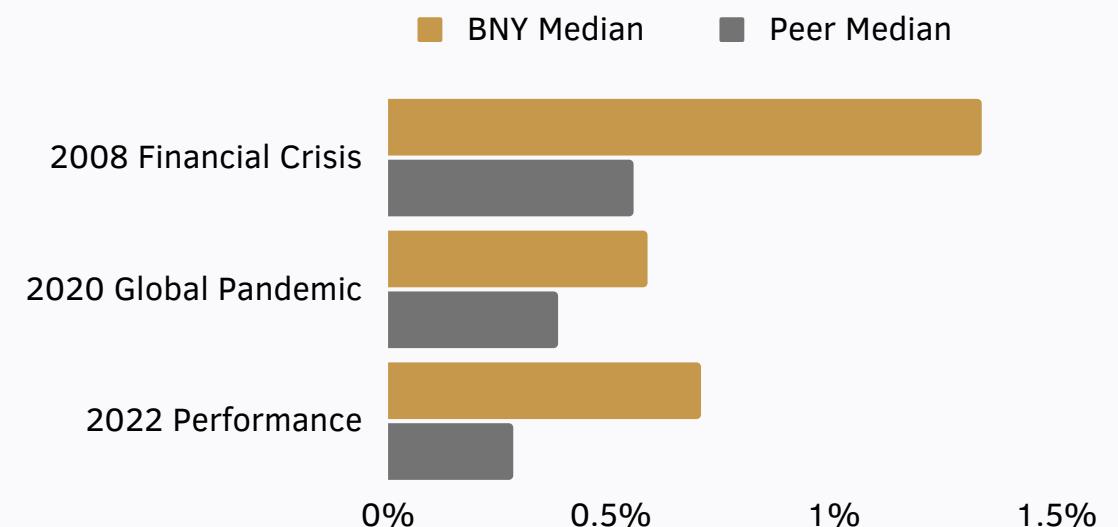
# RESILIENCE AND STABILITY

## PAST PERFORMANCE

- DURING 2008 FINANCIAL CRISIS



### FEES TO AUM RATIO

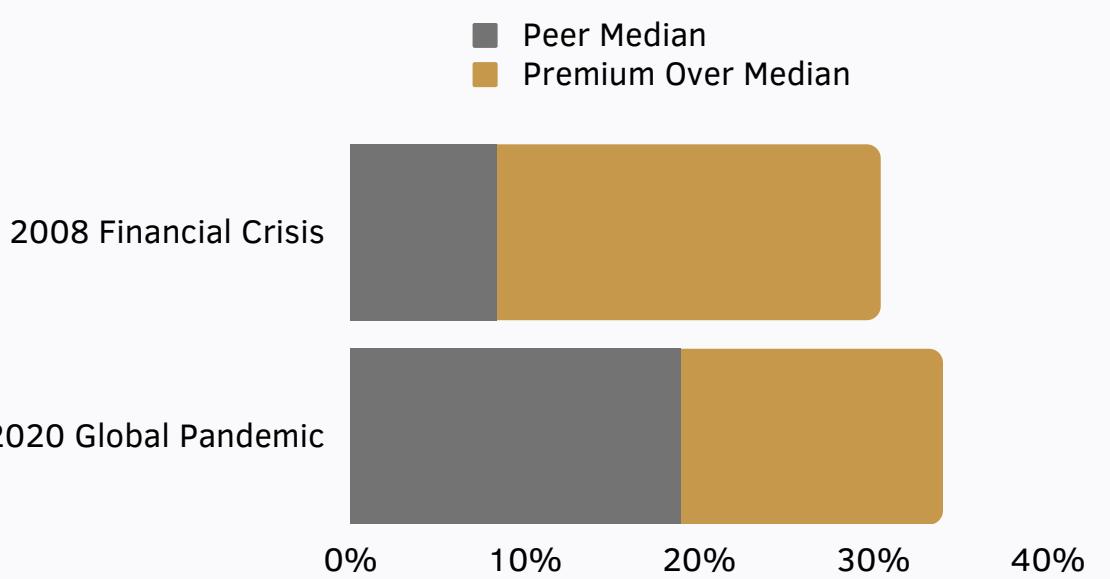


Source: Team Analysis, Company Data

- DURING 2020 GLOBAL COVID PANDEMIC CRISIS



### NET PROFIT PREMIUM OVER MEDIAN

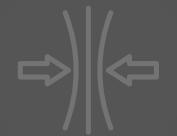


- OUR OUTLOOK FOR 2023



Source: Team Analysis

# INVESTMENT SUMMARY



**RESILIENCE &  
STABILITY**

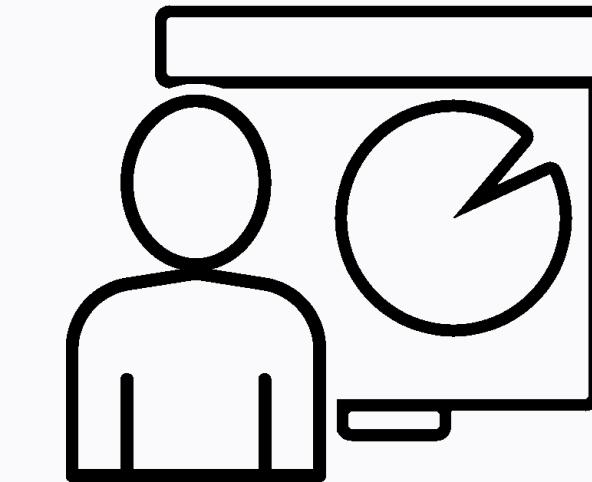
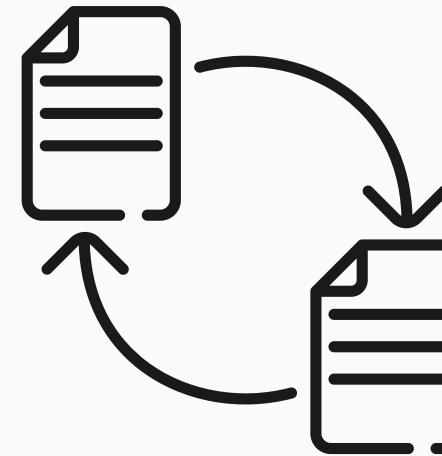
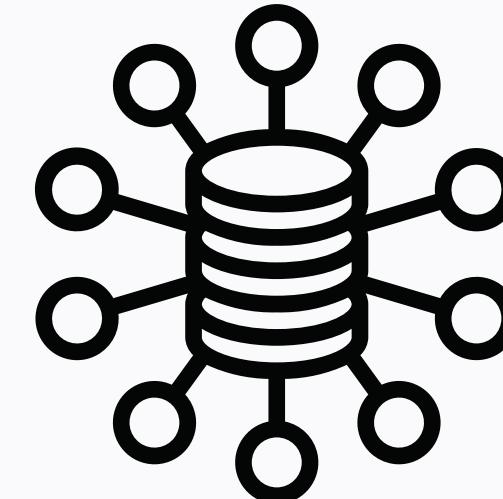


**DIGITAL  
INNOVATION**



**BUSINESS  
OPTIMIZATION**





2021

Developed solutions  
for digital asset  
technology

2022

BNY Mellon launched  
a Digital Asset  
Custody Platform

2023

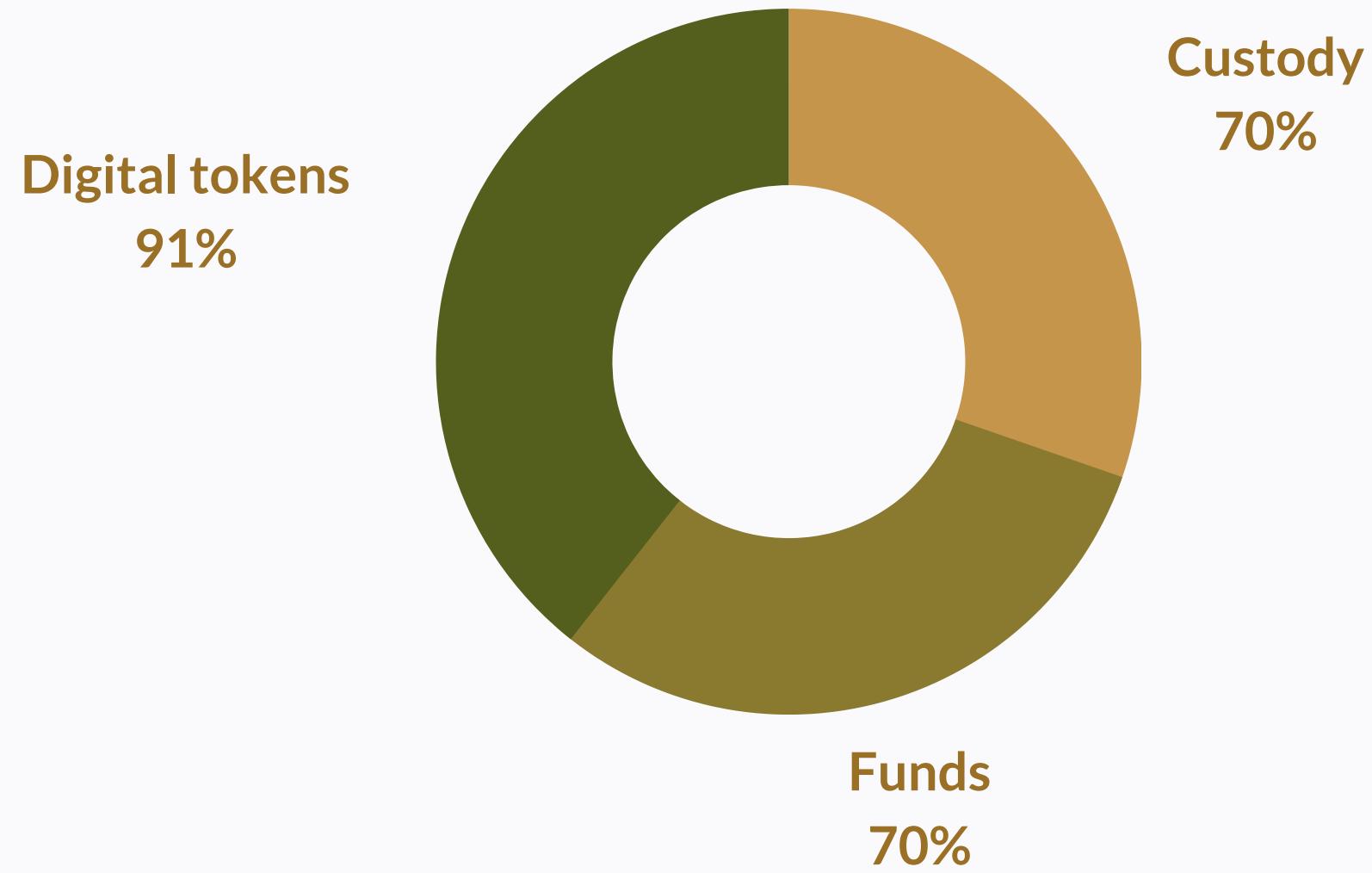
Introduced PershingX  
technology in  
collaboration with  
Conquest

2024 & Beyond

The Markets in Cryptoassets  
Regulation (MiCA) is  
estimated to become  
applicable in 2024

# DIGITAL INNOVATION

## Demand for Digital Assets



**BNY MELLON'S  
VISION**

**Tokenization**

**Distributed Ledger  
Technology (DLT)**

### CHALLENGES

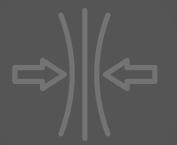
- INTEGRITY
- DATA PRIVACY
- REGULATIONS

### SOLUTIONS

- LAWS
- INFRASTRUCTURE
- PROCEDURE

Source: Company Data, Team Analysis

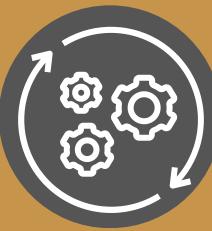
# INVESTMENT SUMMARY



**RESILIENCE &  
STABILITY**



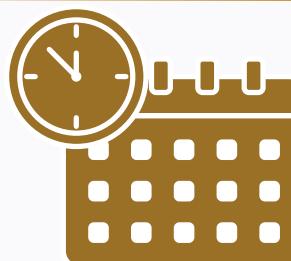
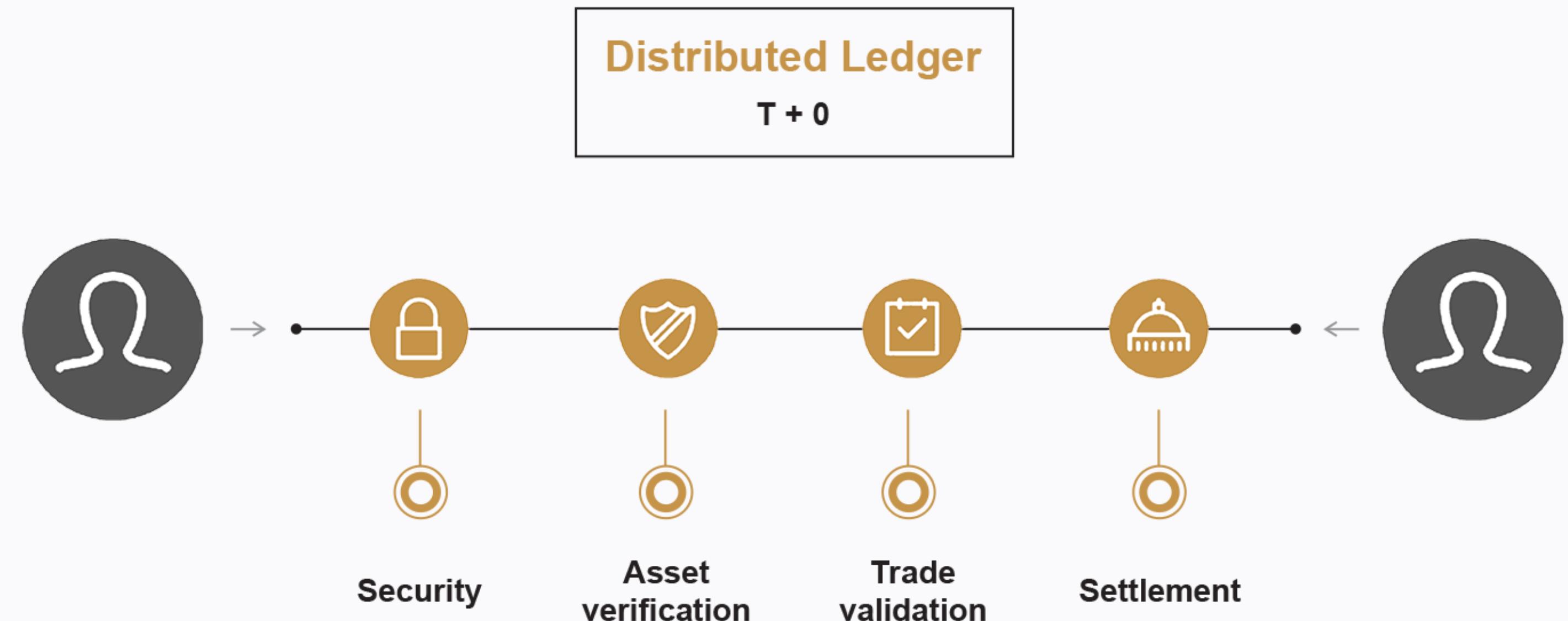
**DIGITAL  
INNOVATION**



**BUSINESS  
OPTIMIZATION**



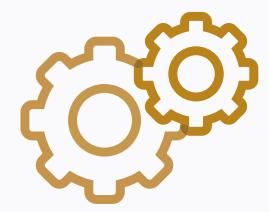
# BUSINESS OPTIMIZATION



**REAL TIME PAYMENT**



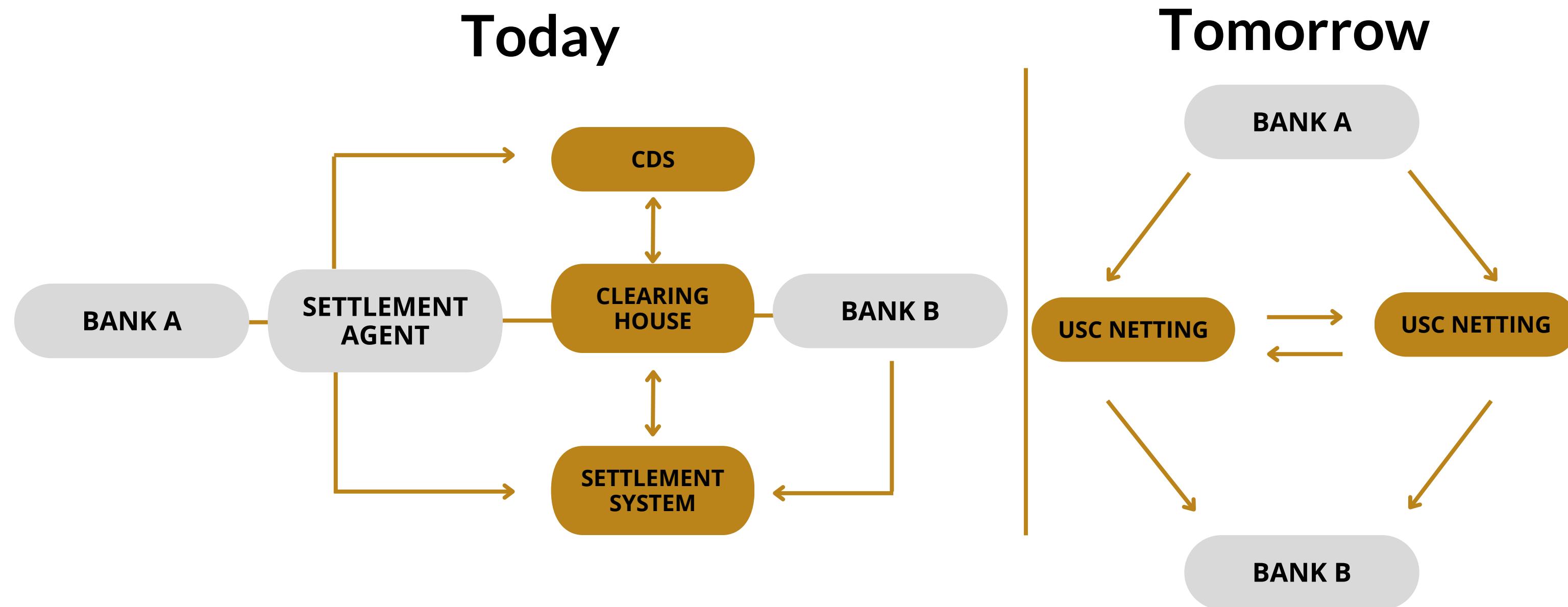
**COST REDUCTION**



**AUTOMATION**

# BUSINESS OPTIMIZATION

## Digital Assets Settlements



Source: Company Data, Team Analysis



# Pershing X

## Unprecedented



Platform gives scale due to financial applications working seamlessly.

Data flows simply and securely within the financial applications



## Unleashed



Sophisticated and on-demand client cooperation to boost productivity

## CAPITAL ADEQUACY & LIQUIDITY

**CET 1 Ratio of 11.2%**

Exceptionally **greater** than the regulatory requirement of 8.5%

**Tier 1 Ratio of 14.2%**

**Greater** than the minimum stress ratio of 13.7%

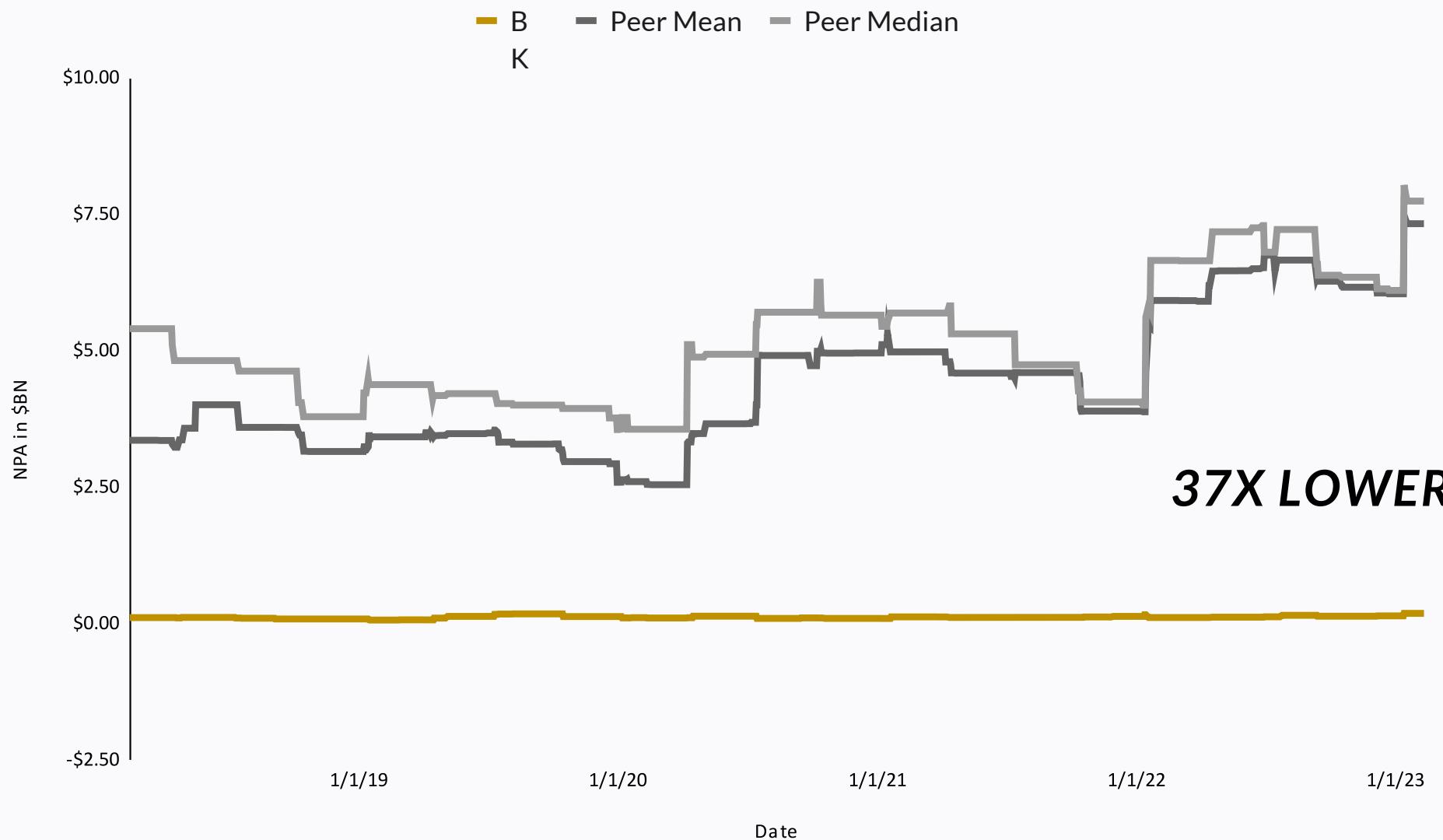
**LCR of 111.8%**

12% **greater** than the regulatory requirement

Source: Company Data, Team Analysis

## ASSET QUALITY

### Non-Performing Assets Comparison with Peers



Source: Company Data, Refinitiv, Team Analysis

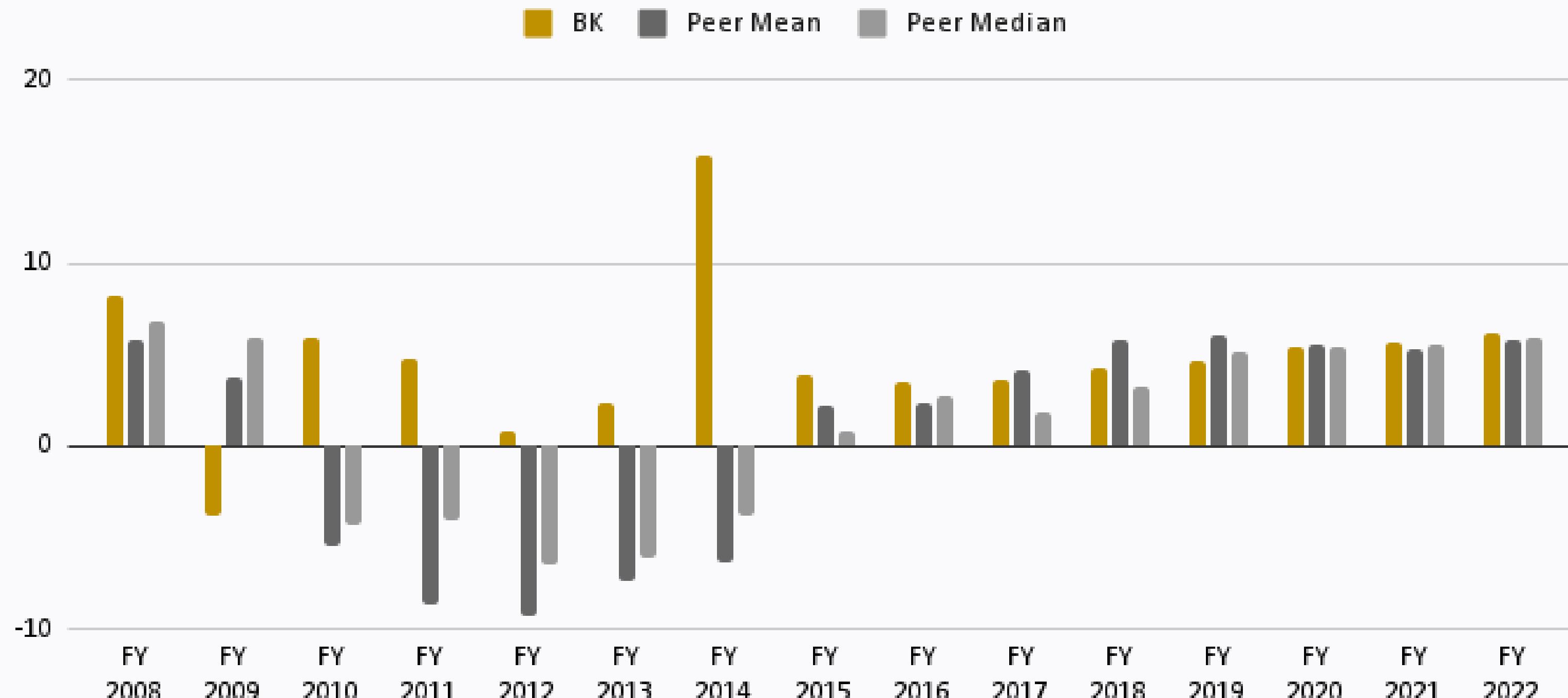
**99%**  
  
 of securities portfolio rated AAA/AA-

*Source: Team Analysis*

# FINANCIAL ANALYSIS - PROFITABILITY

## REVENUE PER-SHARE GROWTH

15 YEARS HISTORICAL TOTAL REVENUE PER SHARE, 5 YR CAGR

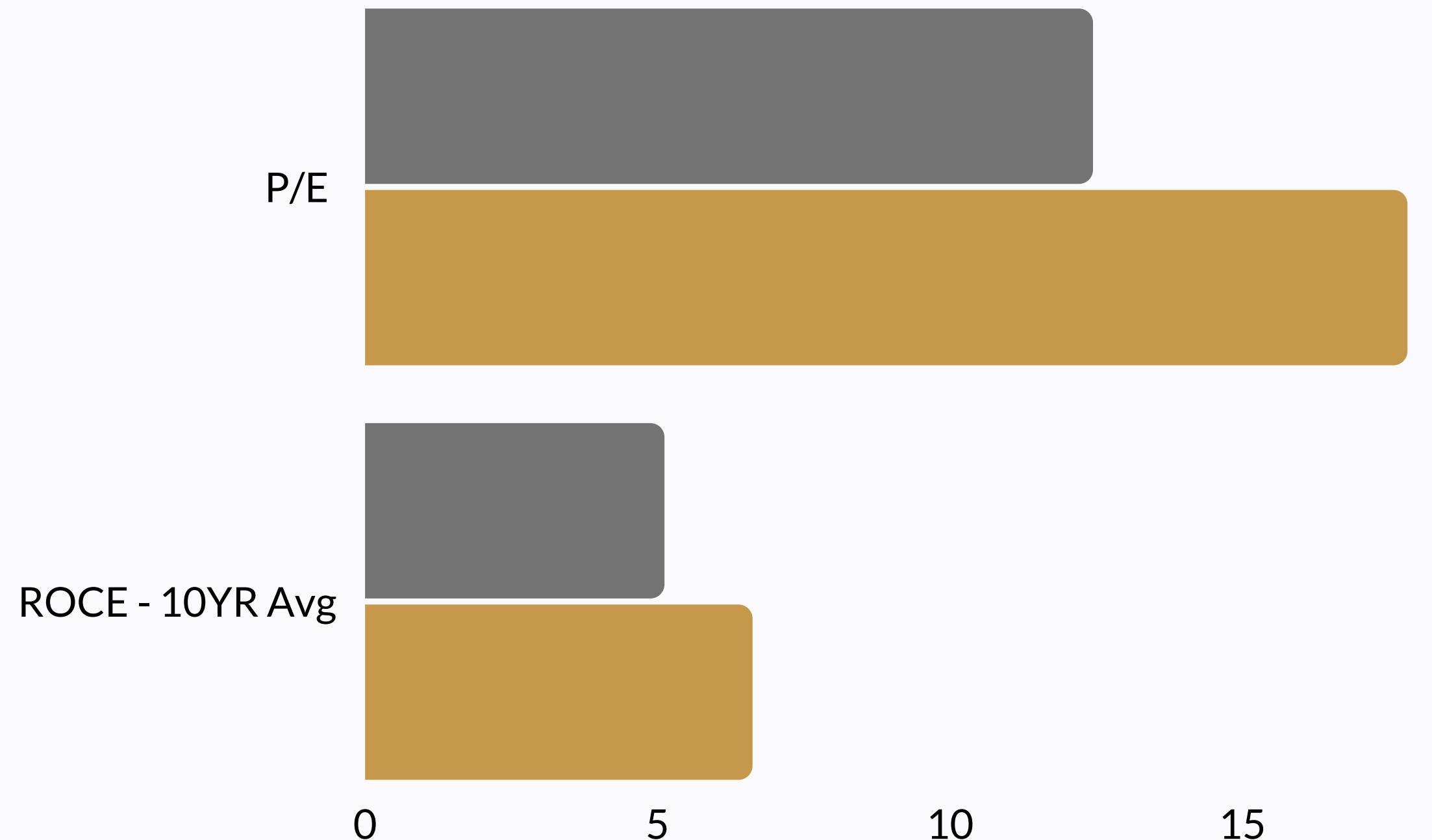


Source: Company Data, Refinitiv, Team Analysis

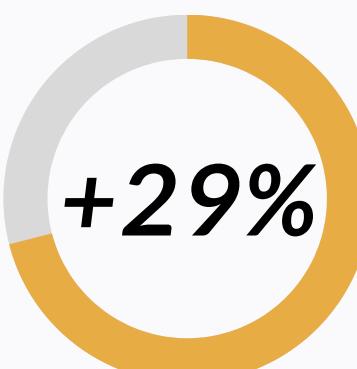
# FINANCIAL ANALYSIS - PROFITABILITY

## REMARKABLE PROFITABILITY OVER PEERS

■ Peer Mean ■ BNY Mellon

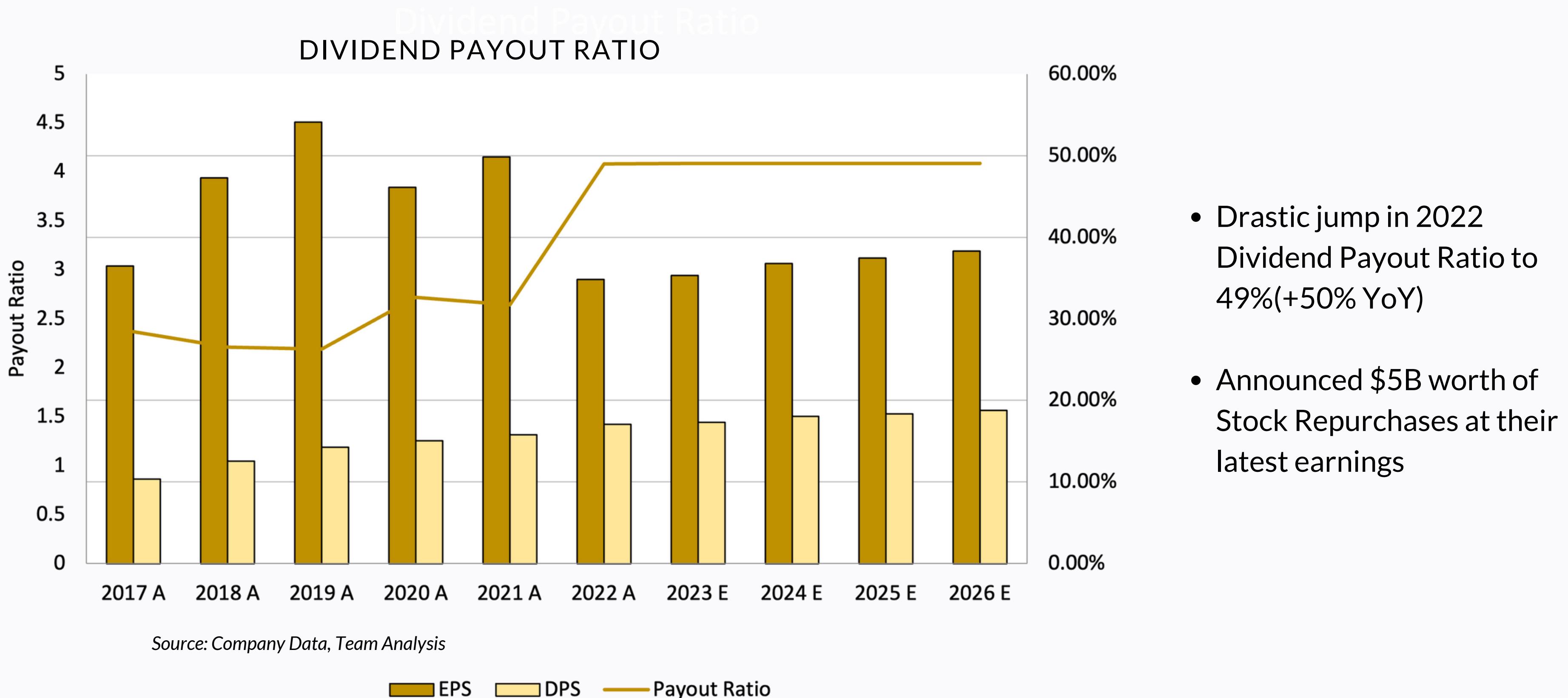


**PREMIUM**



*Source: Company Data, Refinitiv, Team Analysis*

# FINANCIAL ANALYSIS - EQUITY



# VALUATION - HOW THE PILLARS ARE INVOLVED

## RESILIENCE & STABILITY

- STABLE REVENUE STREAM UNDER ADVERSE MACROECONOMIC CONDITIONS

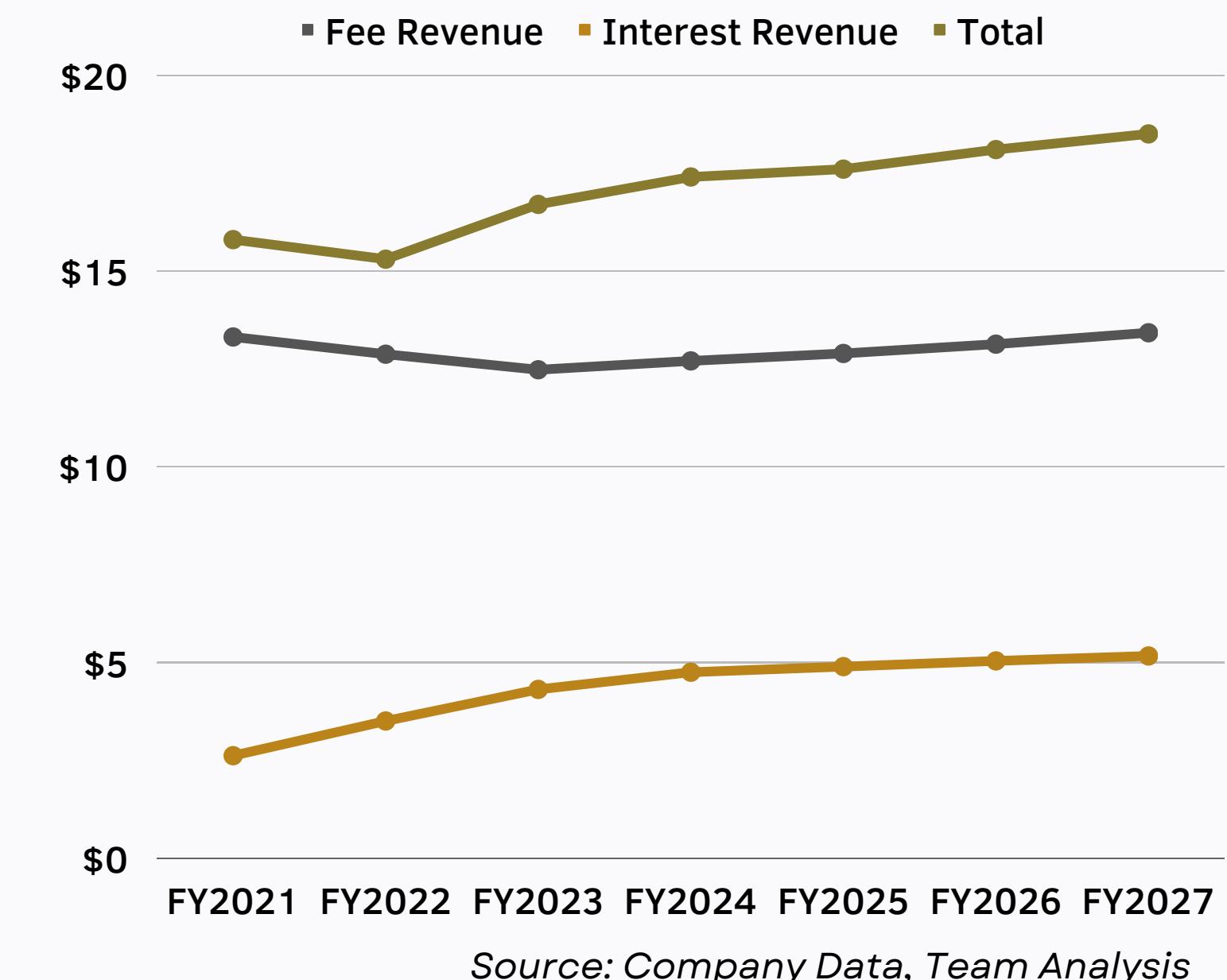
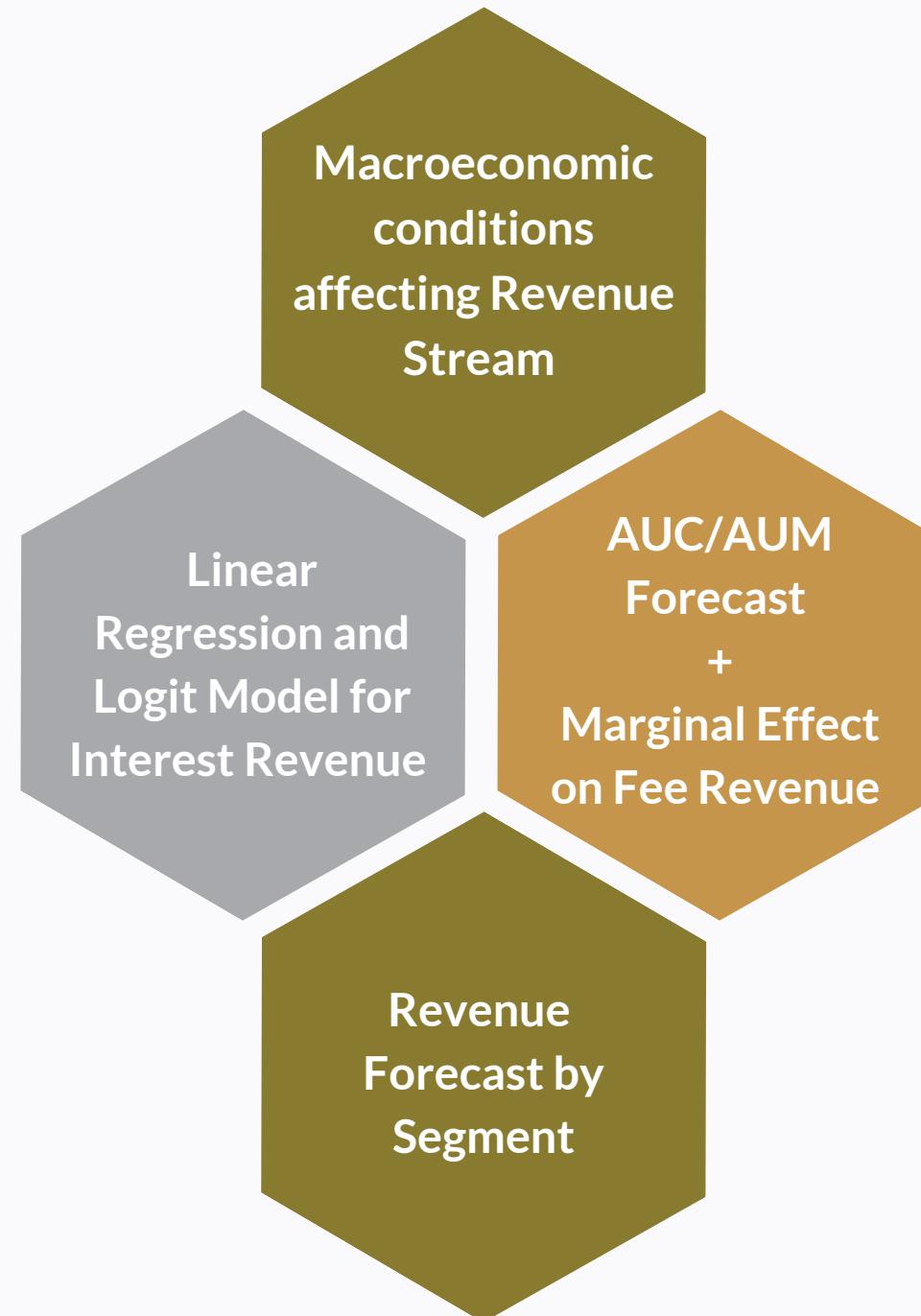
## DIGITAL INNOVATION

- INCREASE IN BASELINE REVENUE
- REDUCED NON INTEREST EXPENSES
- INCREASE IN AUC/AUM

## BUSINESS OPTIMIZATION

- REDUCED NON INTEREST EXPENSES
- INCREASE IN PROFIT MARGINS

# VALUATION - FUNDAMENTAL ANALYSIS



# VALUATION - RESULTS

Valuation Matrix		
Method	Weight %	Implied Share Price
Relative Valuation	50%	\$59.34
Residual Income Model	30%	\$51.68
Dividend Discount Model	20%	\$84.90
<b>Target Price</b>		<b>\$62.15</b>
Premium to Last Price		<b>24.16%</b>

Valuation Assumptions		
Global Assumptions	Forecast	Terminal
Risk-Free Rate	4.79%	2.07%
Beta	1.02	1.06
Market Risk Premium	6.20%	3.50%
<b>Cost of Equity</b>	<b>6.23%</b>	<b>3.59%</b>
<b>Terminal Growth rate</b>		<b>2.64%</b>

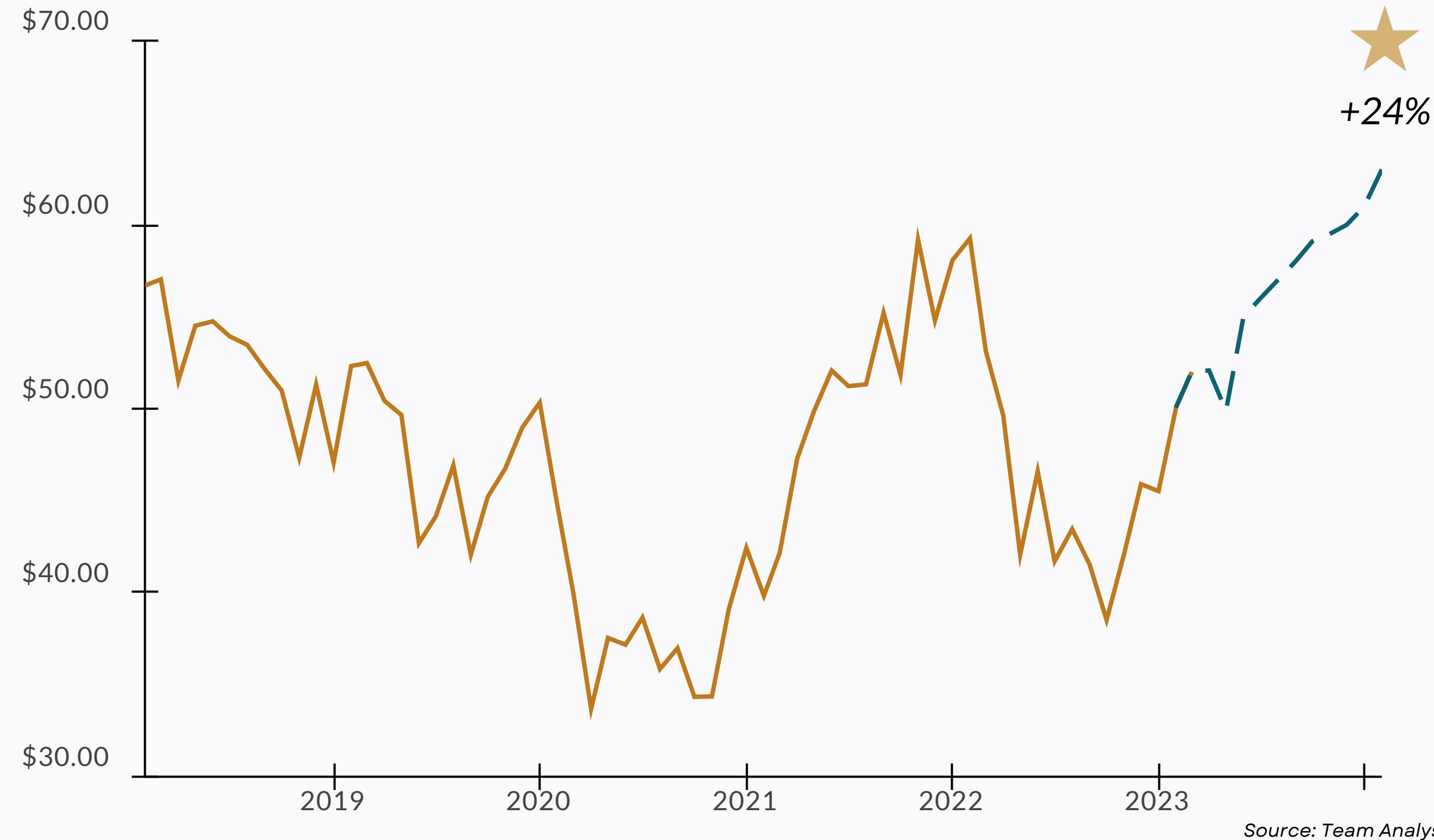
Source: Team Analysis

## DDM SENSITIVITY TO COST OF EQUITY AND PAYOUT RATIO

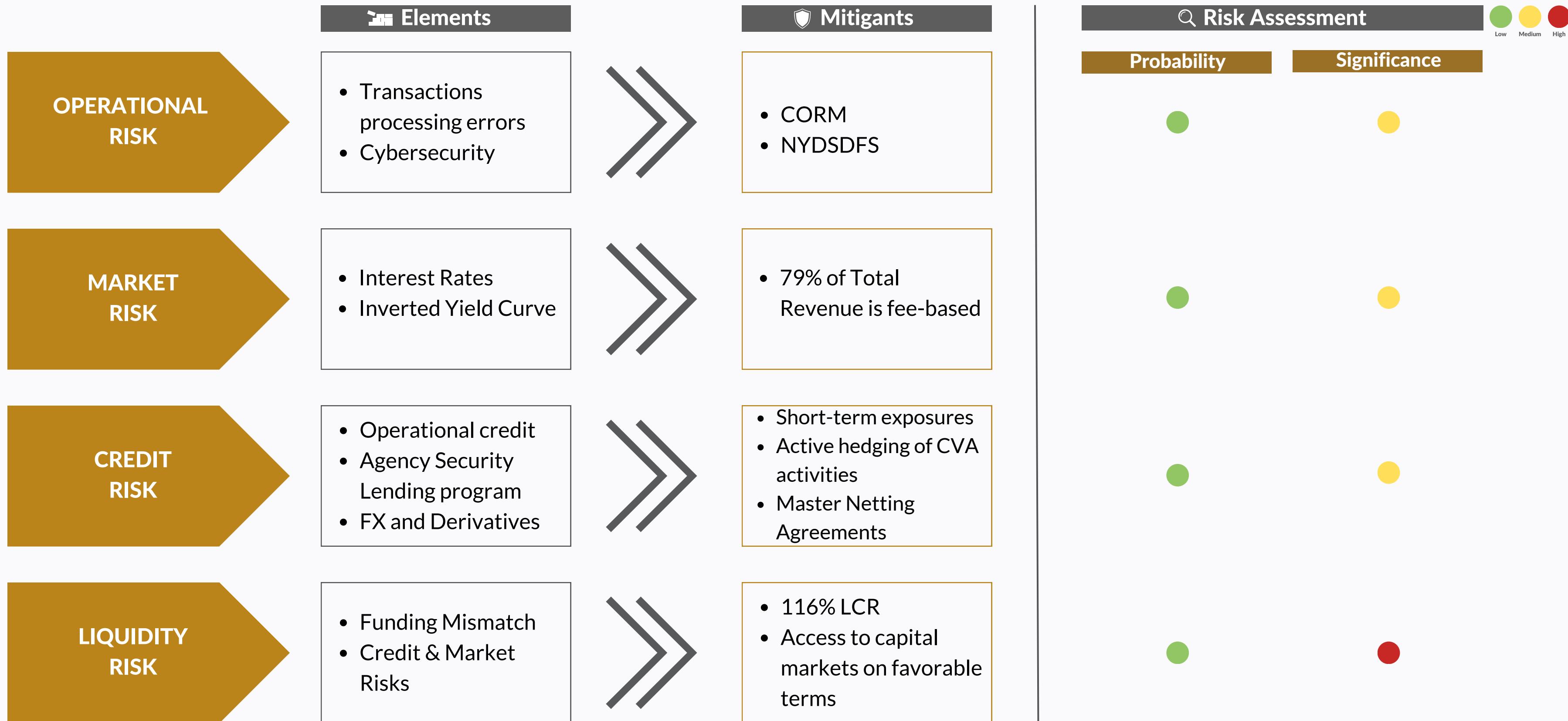
		Terminal Cost of Equity				
		3.4%	3.5%	3.6%	3.7%	3.8%
Payout Ratio	10%	38.9	35.2	32.6	29.7	27.7
	20%	71.5	63.9	58.7	53.1	49.1
	30%	104.1	92.7	84.9	76.5	70.4
	40%	136.6	121.5	111.1	99.8	91.8
	50%	169.2	150.3	137.3	123.2	113.1

Source: Team Analysis

## VALUATION - PRICE TRAJECTORY



# INVESTMENT RISKS



# APPENDIX

- 1. INCOME STATEMENT
- 2. LINEAR REGRESSION FOR INT. REV.
- 3. LOGIT REGRESSION
- 4. NET INTEREST REVENUE
- 5. NET INTEREST REVENUE GRAPH
- 6. ASSETS UNDER CUSTODY/MNGMNT
- 7. Fee REVENUE
- 8. HISTORICAL P/E AGAINST PEERS
- 9. SECURITIES, CAPITAL REQ, PEERS
- 10. INNOVATION: FINTECH COMPANIES
- 11. ESG ACCOMPLISHMENTS
- 12. RELATIVE VALUATION
- 13. Liquidity Disclosure HQLA
- 14. Liquidity Disclosure LCR (1)
- 15. Liquidity Disclosure LCR (2)
- 16. PROBABILITY OF RECESSION

# APPENDIX - INCOME STATEMENT

Income Statement (\$ in millions)		Actual				Projected				
		FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27
Fee Revenue		\$13,274	\$12,831	\$13,313	\$12,873	\$12,476	\$12,702	\$12,892	\$13,130	\$13,421
YoY %		-3%	4%	-3%	-3%	-3%	2%	1%	2%	2%
Net Interest Revenue		\$3,188	\$2,977	\$2,618	\$3,504	\$4,311	\$4,751	\$4,893	\$5,040	\$5,166
YoY %		-7%	-12%	34%	23%	10%	3%	3%	3%	3%
Total Revenue		\$16,462	\$15,808	\$15,931	\$16,377	\$16,788	\$17,453	\$17,785	\$18,170	\$18,586
YoY %		-4%	1%	26%	3%	4%	2%	2%	2%	2%
- Provision for credit losses		<span style="color: red;">-\$25</span>	\$336	<span style="color: red;">-\$231</span>	\$39	\$39	\$39	\$39	\$39	\$39
- Non Interest Expense		\$10,900	\$11,004	\$11,514	\$13,010	\$13,469	\$14,001	\$14,267	\$14,575	\$14,908
Net Profit Margin		34%	28%	29%	20%	20%	20%	20%	20%	20%
Income before taxes		\$5,587	\$4,468	\$4,648	\$3,328	\$3,280	\$3,413	\$3,479	\$3,556	\$3,639
- Provision for income taxes		\$1,120	\$842	\$877	\$768	\$757	\$788	\$803	\$821	\$840
% of income tax		19%	19%	23%	23%	23%	23%	23%	23%	23%
Net Income		\$4,467	\$3,626	\$3,771	\$2,560	\$2,523	\$2,625	\$2,676	\$2,735	\$2,799
YoY %		-19%	4%	-32%	-1%	4%	2%	2%	2%	2%
- Preferred dividends		\$169	\$194	\$207	\$198	\$195	\$203	\$207	\$212	\$217
% preferred dividends		4%	5%	5%	8%	8%	8%	8%	8%	8%
Net Income Av. to common		\$4,272	\$4,323	\$3,552	\$2,362	\$2,328	\$2,422	\$2,469	\$2,524	\$2,583
diluted shares outstanding (common shares in thousands)				815,846		\$790,846	790,846	790,846	790,846	790,846
share repurchase						\$5,000				
shares repurchased @\$50						\$25,000				
Diluted EPS			\$3.83	\$4.14	\$2.90	\$2.94	\$3.06	\$3.12	\$3.19	\$3.27
Dividends per share			\$1.24	\$1.30	\$1.42	\$1.44	\$1.50	\$1.53	\$1.57	\$1.60
Payout Ratio		40%	40%	40%	49%	49%	49%	49%	49%	49%

Source: Team Analysis

## APPENDIX - LINEAR REGRESSION

	FY19	FY20	FY21	FY22
Net interest margin	1.10%	0.84%	0.86%	1.19%

$$\Delta \text{Net Interest Revenue}_t = \beta_0 + \beta_1 \Delta \text{Fed Funds Rate}(bps)_{t-1} + \varepsilon_t$$

<i>Fed Funds Rate</i>		<i>Regression Statistics</i>	
Coefficients	0.139	Multiple R	0.81252265
Standard Error	0.179	R Square	0.66019305
t Stat	7.7607	Adjusted R Square	0.64923154
P-value	0.000	Standard Error	0.46408195
F	60.23	Observations	33

Source: Team Analysis

# APPENDIX - LOGIT REGRESSION



$$f(y)_t = \alpha_t f(x)_t + \varepsilon_t$$

Logit Regression Output	
Alpha	0.675
Standard Error	0.16743085
t Stat	2.23973066
P-value	0.03175606
F	5.01

Avg.rate increase if rev decrease	0.026bps
Avg rev decrease with rate increase	-3.20%
Avg. rate decrease if rev increase	-0.010bps
Avg. rev increase if rate decrease	2.33%

	Rates increase	Rates decrease
Rev. increase	17	4
Rev. decrease	8	8

	Rates increase	Rates decrease
Rev. increase	46%	11%
Rev. decrease	22%	22%

Source: Team Analysis

# APPENDIX - NET INTEREST REVENUE

Table 1: Back-test for 2022

	<b>1Q22</b>	<b>2Q22</b>	<b>3Q22</b>	<b>4Q22</b>
<b>Securities Services</b>	<b>\$377.00</b>	<b>\$457.00</b>	<b>\$538.00</b>	<b>\$656.00</b>
growth rate YoY	5.90%	29.10%	54.20%	78.70%
interest rates effect as % of growth	17.50%	36.80%	43.00%	47.90%
non-interest rates growth as % of growth	82.50%	63.20%	57.00%	52.10%
non-interest rates growth	4.90%	18.40%	30.90%	41.00%
forecasted interest rates total effect	0.20%	3.90%	10.00%	18.10%
<b>Market &amp; Wealth</b>	<b>\$296.00</b>	<b>\$340.00</b>	<b>\$378.00</b>	<b>\$396.00</b>
growth rate YoY	2.40%	17.60%	33.60%	33.30%
interest rates effect as % of growth	42.60%	60.70%	69.40%	113.20%
non-interest rates growth as % of growth	57.40%	39.30%	30.60%	-13.20%
non-interest rates growth	1.40%	6.90%	10.30%	-4.40%
forecasted interest rates total effect	0.40%	6.50%	16.10%	42.70%
<b>Investment &amp; Wealth Management</b>	<b>\$57.00</b>	<b>\$62.00</b>	<b>\$57.00</b>	<b>\$52.00</b>
growth rate YoY	18.80%	31.90%	21.30%	2.00%
interest rates effect as % of growth	5.50%	33.50%	109.40%	1924.80%
non-interest rates growth as % of growth	94.50%	66.50%	-9.40%	-1824.80%
non-interest rates growth	17.70%	21.20%	-2.00%	-35.80%
forecasted interest rates total effect	0%	4%	25%	726%
<b>Other</b>	<b>(\$32.00)</b>	<b>(\$35.00)</b>	<b>(\$47.00)</b>	<b>(\$48.00)</b>
growth rate YoY	15.80%	22.20%	-23.70%	-26.30%
interest rates effect as % of growth	6.50%	48.20%	-98.30%	-143.40%
non-interest rates growth as % of growth	100.00%	100.00%	100.00%	100.00%
non-interest rates growth	14.80%	11.50%	-47.00%	-64.10%
forecasted interest rates total effect	0%	5%	-23%	-54%
<b>Fed Funds Rate</b>	0.2	1.21	2.56	4.1
bps change	11	114	248	402
marginal effect YoY	1.03%	10.70%	23.28%	37.74%

Table 2: Net Interest Revenue Forecast

	<b>FY22</b>	<b>1Q23</b>	<b>2Q23</b>	<b>3Q23</b>	<b>4Q23</b>	<b>FY23</b>	<b>FY24</b>
<b>Securities Services</b>	<b>\$2,028.00</b>	<b>\$497.05</b>	<b>\$588.65</b>	<b>\$658.58</b>	<b>\$756.09</b>	<b>\$2,500.36</b>	<b>\$2,962.69</b>
growth rate YoY	42.20%	31.80%	28.80%	22.40%	15.30%	23.30%	18.50%
interest rates effect as % of growth		42.60%	42.60%	42.60%	42.60%	42.60%	42.60%
non-interest rates growth as % of growth		57.40%	57.40%	57.40%	57.40%	57.40%	57.40%
non-interest rates growth		13.70%	13.70%	13.70%	13.70%	13.70%	20.50%
forecasted interest rates total effect		18.20%	15.10%	8.80%	1.60%	10.90%	-2.00%
<b>Market &amp; Wealth</b>	<b>\$1,410.00</b>	<b>\$409.04</b>	<b>\$450.17</b>	<b>\$454.44</b>	<b>\$422.13</b>	<b>\$1,735.77</b>	<b>\$1,762.20</b>
growth rate YoY	21.80%	38.20%	32.40%	20.20%	6.60%	23.10%	1.50%
interest rates effect as % of growth		81.10%	81.10%	81.10%	81.10%	81.10%	81.10%
non-interest rates growth as % of growth		18.90%	18.90%	18.90%	18.90%	18.90%	18.90%
non-interest rates growth		3.60%	3.60%	3.60%	3.60%	3.60%	5.30%
forecasted interest rates total effect		34.60%	28.90%	16.70%	3.00%	20.80%	-3.80%
<b>Investment &amp; Wealth Management</b>	<b>\$228.00</b>	<b>\$74.57</b>	<b>\$77.95</b>	<b>\$65.54</b>	<b>\$53.54</b>	<b>\$271.60</b>	<b>\$263.65</b>
growth rate YoY	18.10%	30.80%	25.70%	15.00%	3.00%	19.10%	-2.90%
interest rates effect as % of growth		71.50%	71.50%	71.50%	71.50%	71.50%	71.50%
non-interest rates growth as % of growth		28.50%	28.50%	28.50%	28.50%	28.50%	28.50%
non-interest rates growth		0.30%	0.30%	0.30%	0.30%	0.30%	0.40%
forecasted interest rates total effect		30.50%	25.40%	14.70%	2.70%	18.30%	-3.40%
<b>Other</b>	<b>(\$162.00)</b>	<b>(\$38.78)</b>	<b>(\$42.42)</b>	<b>(\$56.96)</b>	<b>(\$58.17)</b>	<b>(\$196.32)</b>	<b>(\$237.92)</b>
growth rate YoY	-1.90%	-21.20%	-21.20%	-21.20%	-21.20%	-21.20%	-21.20%
interest rates effect as % of growth	0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
non-interest rates growth as % of growth	100%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
non-interest rates growth	-21.20%	-21.20%	-21.20%	-21.20%	-21.20%	-21.20%	-21.20%
forecasted interest rates total effect	0	0.00%	0.00%	0.00%	0.00%	0.00%	0%
<b>Fed Funds Rate</b>		4.75	5	4.75	4.5		4
bps change		455	379	219	40		-50
marginal effect YoY		42.72%	35.58%	20.56%	3.76%		-4.69%

# APPENDIX - NET INTEREST REVENUE

Table 3: Interest Revenue Forecast for each business line



Source: Team Analysis

# APPENDIX - ASSETS UNDER CUSTODY/MANAGEMENT

Our initial hypothesis was that the increases in Fed rates negatively impacted the Assets Under Custody/Management, via (i) higher funding costs for investors, (ii) lower liquidity in the market, and (iii) poor performance of investments, which altogether would produce a decrease in the demand for BNY Mellon's services. In 2022 there was a 390bps increase YoY in the Fed rates, with corresponding decreases of 5% and 24% in AUC and AUM, respectively. Taking this into consideration, we computed the marginal effect of an increase in the Fed Rate to predict the YoY change in AUM during 2023 and 2024.

The following graphs shows the initial decrease, as well as the predicted change from our estimation.

Table 1: Assets Under Custody (AUC/A)

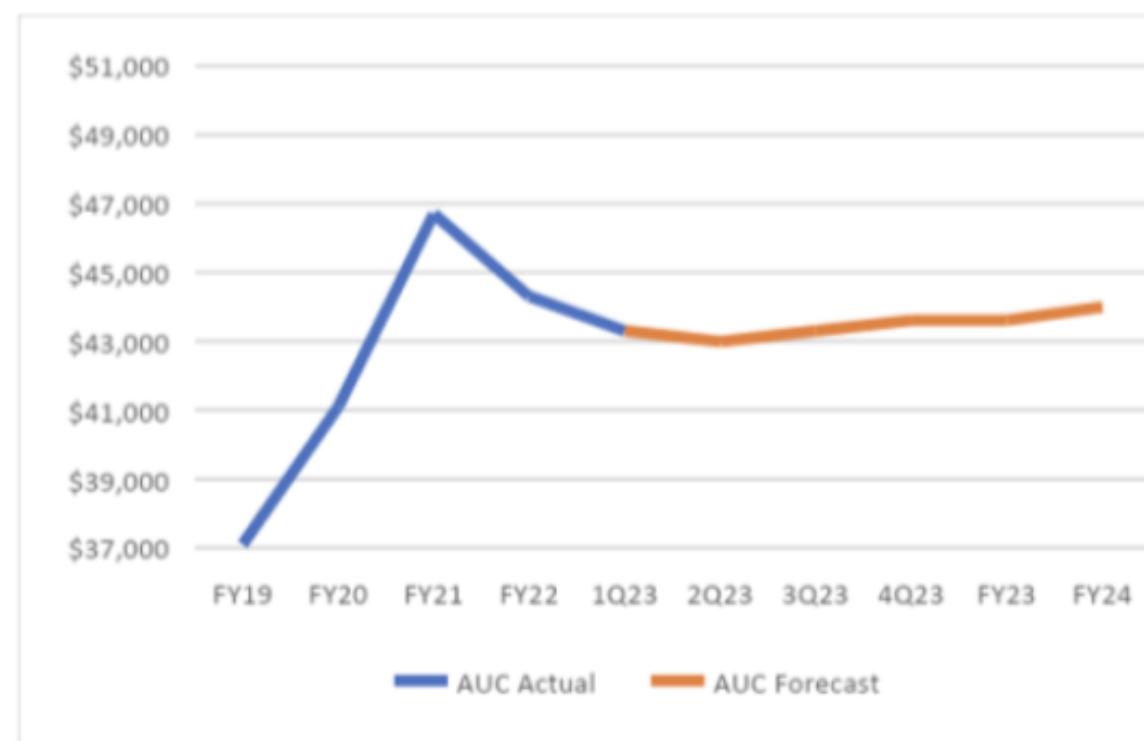
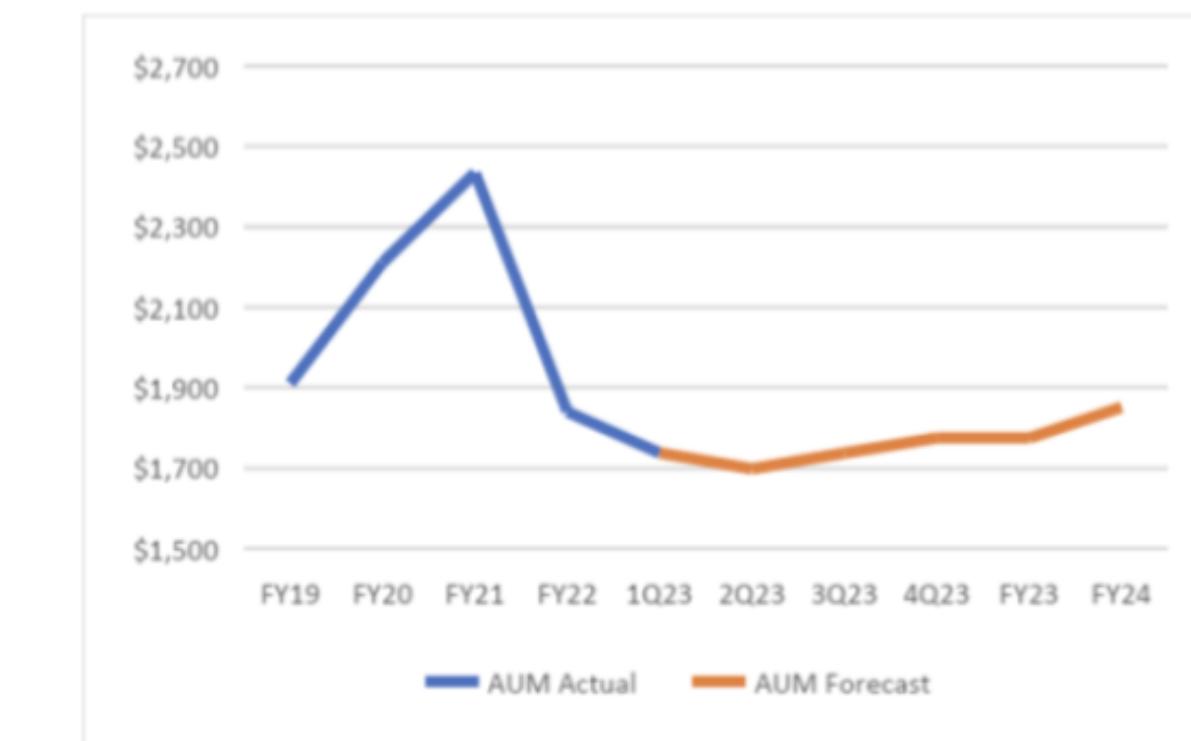


Table 2: Assets Under Management (AUM)



Source: Team Analysis

The effect of 1bps increase is 6.15 for AUC and 1.52 for AUM, computed with a 390bps increase in YoY in 2022.

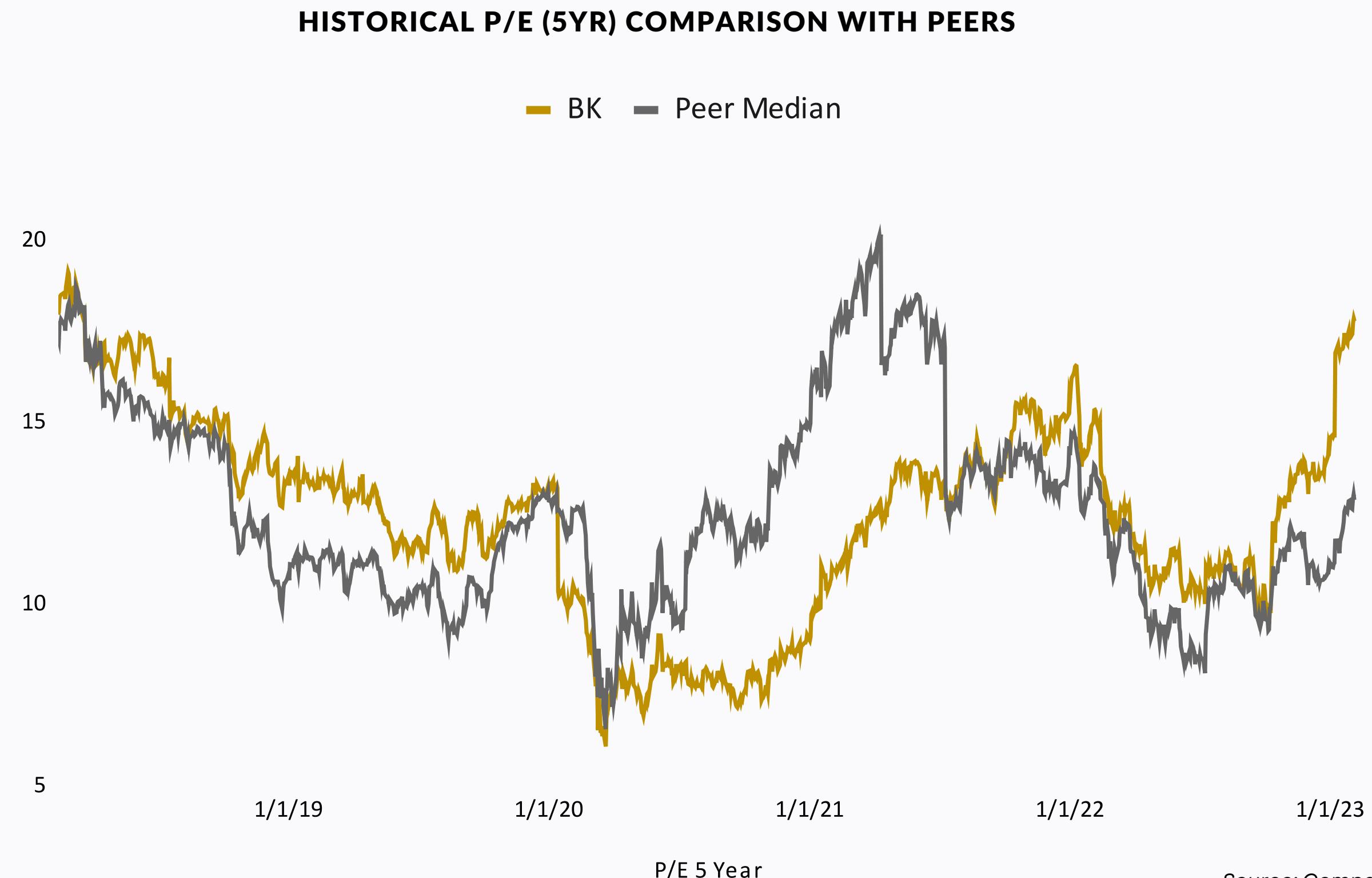
## APPENDIX - FEE REVENUE

We assume that the growth rates of the Fee Revenue will change proportionally with AUC/A and AUM estimations. The following tables show the changes per sector based on our estimation.

Fee Revenue Segment	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27
Securities Services	\$5,327	\$5,519	\$5,624	\$5,713	\$5,658	\$5,718	\$5,828	\$5,965	\$6,131
Market & Wealth Services	\$3,409	\$3,516	\$3,536	\$3,832	\$3,916	\$3,954	\$4,029	\$4,125	\$4,242
Investment & Wealth Management	\$3,467	\$3,447	\$3,782	\$3,349	\$2,932	\$3,056	\$3,056	\$3,056	\$3,056
Other	\$837	\$71	\$51	(\$312)	(\$312)	(\$312)	(\$312)	(\$312)	(\$312)
Other Adjustments	\$234	\$278	\$320	\$291	\$282	\$287	\$291	\$297	\$303
<b>Total Fee &amp; Other Revenue</b>	<b>\$13,274</b>	<b>\$12,831</b>	<b>\$13,313</b>	<b>\$12,873</b>	<b>\$12,476</b>	<b>\$ 12,702</b>	<b>\$12,892</b>	<b>\$13,130</b>	<b>\$13,421</b>
<i>growth YoY</i>		-3%	4%	-3%	-3.08%	1.81%	1.49%	1.85%	2.21%

Source: Team Analysis

# APPENDIX - FINANCIAL ANALYSIS



*Source: Company Data, Team Analysis*

# APPENDIX - FINANCIAL ANALYSIS

## CREDIT RATING DISCLOSURE OF SECURITIES PORTFOLIO

Credit Rating	AAA/AA-	A+/A-	BBB+/BBB-	BB+	A1+/A2	NOT RATED
% of Securities Portfolio	99.0%	1.0%	0.0%	0.0%	0.0%	0.0%

Source: Company Data, Team Analysis

## BNY MELLON CAPITAL REQUIREMENT

Capital Requirement	Required	BNY Mellon	Sufficient?
CET Ratio	8.5	11.2	TRUE
Tier 1 Ratio	13.7%	14.2%	TRUE
LCR	100.0%	111.8%	TRUE

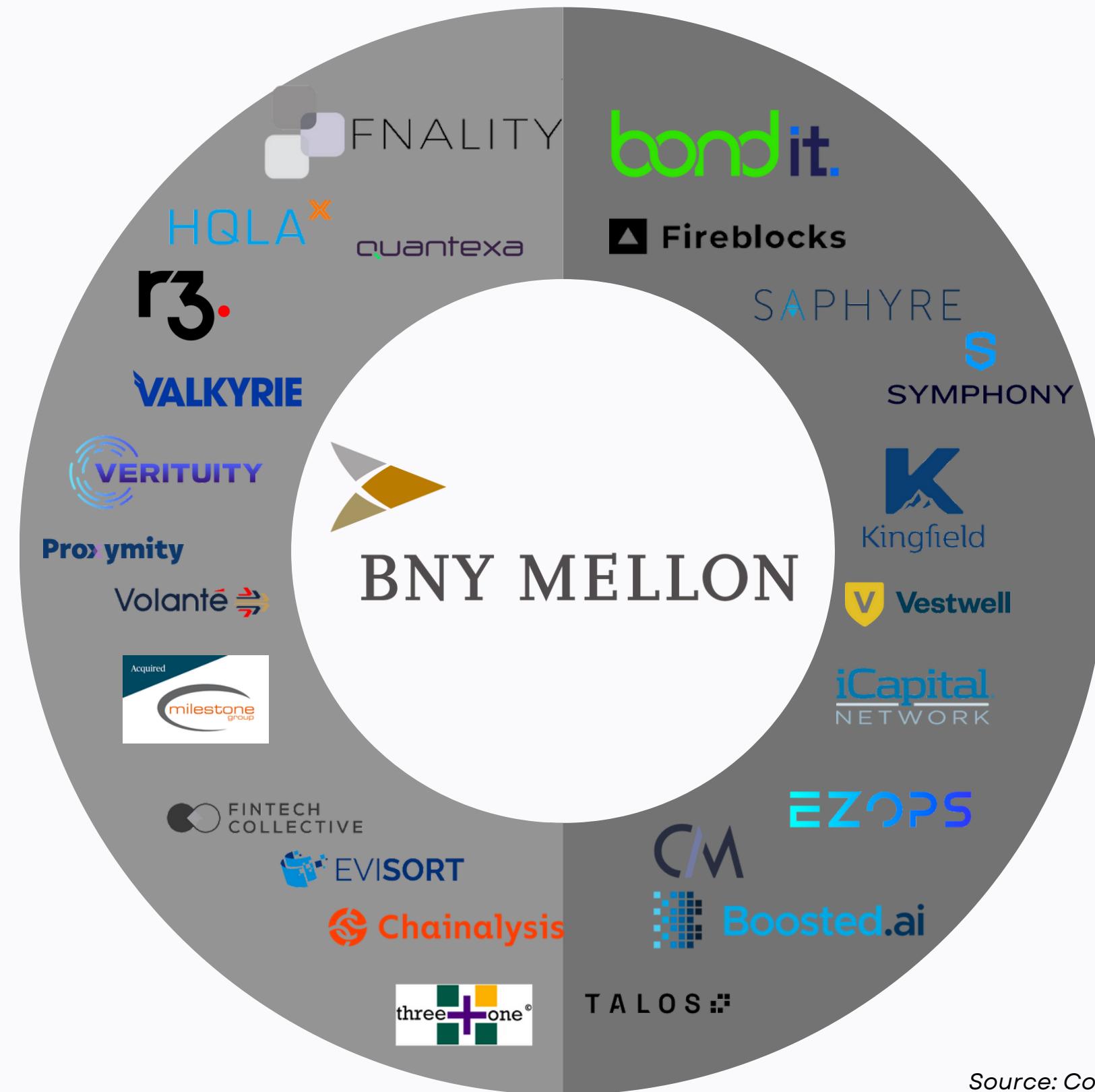
Source: Company Data, Team Analysis

## CROSS STATEMENT PEER ANALYSIS TABLE

Peer Analysis	ROCE 3YR	ROCE 15YR	ROTCE FY0	5YR CAGR Total Revenue/Share	P/E FY0	P/TBV FY0
Bank of New York Mellon Corp	11.3%	6.6%	14.6%	6.2%	17.79	2.48
Peer Median	10.6%	12.3%	12.8%	7.7%	12.87	1.63
Peer Average	11.2%	5.1%	12.7%	5.8%	12.43	1.61
Premium over Median	7%	-47%	14%	-19%	38.18%	52.31%
Premium over Avg	2%	29%	15%	6%	43.15%	53.51%

Source: Company Data, Team Analysis

# APPENDIX - PORTFOLIO COMPANIES



Source: Company Data, Team Analysis

## APPENDIX - ESG ACCOMPLISHMENTS



## APPENDIX - RELATIVE VALUATION

**Implied Price: \$59.34**

Major Peers in Custody and Investment Services



*Further Support from Relative Valuation on our Bias*

P/E	P/BV
<b>10.5x</b>	<b>1.63x</b>
30%	70%



**+18%**  
**Upside**

<b>Consolidated HQLA and LCR (dollars in billions)</b>	<b>Dec. 31, 2021</b>
Securities (a)	\$ 124
Cash (b)	102
Total consolidated HQLA (c)	\$ 226
Total consolidated HQLA – average (c)	\$ 227
Average LCR	109%

- (a) *Primarily includes securities of U.S. government-sponsored enterprises, U.S. Treasury, sovereign securities, U.S. agency and investment-grade corporate debt.*
- (b) *Primarily includes cash on deposit with central banks.*
- (c) *Consolidated HQLA presented before adjustments. After haircuts and the impact of trapped liquidity, consolidated HQLA totaled \$155 billion at Dec. 31, 2021 and averaged \$159 billion for the fourth quarter of 2021.*

# APPENDIX - LIQUIDITY DISCLOSURE | LCR



<b>Liquidity Coverage Ratio</b>		<b>Average</b>	<b>Average</b>
<b>July 1, 2022 to September 30, 2022</b>		<b>Unweighted</b>	<b>Weighted</b>
		<b>Amount</b>	<b>Amount</b>
<b>High-Quality Liquid Assets (b)</b>			
1	Total eligible high-quality liquid assets (HQLA), of which:	137,091	136,106
2	Eligible Level 1 liquid assets	130,523	130,523
3	Eligible Level 2A liquid assets	6,568	5,583
4	Eligible Level 2B liquid assets	-	-
<b>Cash Outflow Amounts</b>			
5	Deposit outflow from retail customers and counterparties, of which:	26,232	6,185
6	Stable retail deposit outflow	1,794	54
7	Other retail funding outflow	13,112	3,415
8	Brokered deposit outflow	11,326	2,716
9	Unsecured wholesale funding outflow, of which:	276,133	123,168
10	Operational deposit outflow	191,936	47,878
11	Non-operational funding outflow	83,516	74,609
12	Unsecured debt outflow	681	681
13	Secured wholesale funding and asset exchange outflow	26,051	9,820
14	Additional outflow requirements, of which:	39,269	16,315
15	Outflow related to derivative exposures and other collateral requirements	7,084	6,956
16	Outflow related to credit and liquidity facilities including unconsolidated structured transactions and mortgage commitments	32,185	9,359
17	Other contractual funding obligation outflow	267	267
18	Other contingent funding obligations outflow	-	-
<b>19</b>	<b>Total Cash Outflow</b>	<b>\$367,952</b>	<b>\$155,755</b>
<b>Cash Inflow Amounts</b>			
20	Secured lending and asset exchange cash inflow	49,013	23,387
21	Retail cash inflow	11	6
22	Unsecured wholesale cash inflow	9,233	8,821
23	Other cash inflows, of which:	8,650	8,650
24	Net derivative cash inflow	60	60
25	Securities cash inflow	210	210
26	Broker-dealer segregated account inflow	8,380	8,380
27	Other cash inflow	-	-
<b>28</b>	<b>Total Cash Inflow</b>	<b>\$66,907</b>	<b>\$40,864</b>

Source: Company Data, 3Q2022 Liquidity Disclosure

# APPENDIX - LIQUIDITY DISCLOSURE | LCR

		Average Amount (a)
29	HQLA Amount (b)	136,106
30	Total Net Cash Outflow Amount Excluding the Maturity Mismatch Add-on	114,891
31	Maturity Mismatch Add-on	2,949
32	Total Unadjusted Net Cash Outflow Amount	117,840
33	Outflow Adjustment Percentage	100%
34	Total Net Cash Outflow Amount	117,840
35	Liquidity Coverage Ratio (%) (c)	116%

- (a) The amounts reported in this column may not equal the calculation of those amounts using component amounts reported in rows 1 – 28 due to technical factors such as the application of the level 2 liquid asset caps and the total inflow cap.
- (b) HQLA excludes excess liquidity held at certain subsidiaries that is not transferable within the Company.
- (c) Disclosed Liquidity Coverage Ratio (LCR) is calculated as a simple average of the daily ratios over the calendar quarter, rather than the calculation of the average HQLA divided by the net cash outflow, for the quarter.

## APPENDIX - PROBABILITY OF RECESSION

