CFA Institute Research Challenge

hosted by

CFA Society New York

Team Q

The CFA Institute Research Challenge is a global competition that tests the equity research and valuation, investment report writing, and presentation skills of university students. The following report was prepared in compliance with the Official Rules of the CFA Institute Research Challenge, is submitted by a team of university students as part of this annual educational initiative and should not be considered a professional report.

Disclosures:

Ownership and material conflicts of interest

The author(s), or a member of their household, of this report does not hold a financial interest in the securities of this company.

The author(s), or a member of their household, of this report does not know of the existence of any conflicts of interest that might bias the content or publication of this report.

Receipt of compensation

Compensation of the author(s) of this report is not based on investment banking revenue.

Position as an officer or a director

The author(s), or a member of their household, does not serve as an officer, director, or advisory board member of the subject company.

Market making

The author(s) does not act as a market maker in the subject company's securities.

Disclaimer

The information set forth herein has been obtained or derived from sources generally available to the public and believed by the author(s) to be reliable, but the author(s) does not make any representation or warranty, express or implied, as to its accuracy or completeness. The information is not intended to be used as the basis of any investment decisions by any person or entity. This information does not constitute investment advice, nor is it an offer or a solicitation of an offer to buy or sell any security. This report should not be considered to be a recommendation by any individual affiliated with CFA Society New York, CFA Institute, or the CFA Institute Research Challenge with regard to this company's stock.

Bank of New York Mellon (BK: NYSE)

Sector: Financials
Industry: Banking
Sub-sector: Global Custodian Banking

Valuation as of January 27th, 2023

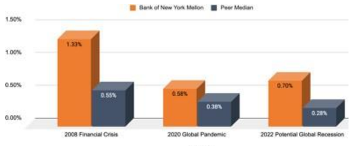
Reccommendation: BUY	
Target Price	**$62.15**
Last close	$50.06
Premium	**24.16%**
Market Cap	$40.46 bn
52-Week High	$64.63
52-Week Low	$36.22
FY1 P / E	10.70x
FY 1 P / BV	0.99x

Source: Team analysis

Figure 1: Historical Price Chart w.

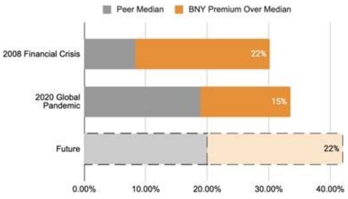
Source: Team Analysis, Bloomberg

Exhibit 1: Fees to AUM Ratio



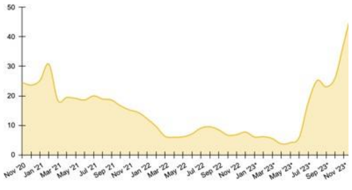
Source: Team Analysis, Company Data

Exhibit 2: Net Profit margin premium of BK over peer median



Source: Team Analysis

Exhibit 3: Probability of Recession in the next 12 months



Source: Team Analysis, Company Data

EXECUTIVE SUMMARY

We are issuing a **BUY** recommendation on Bank of New York Mellon (BK), based on a 12-month price target of $62.15, target price shows 24.16% increase in the stock's market price, from the closing market price of $50.06 on January 27th, 2023. Our recommendation is based on the following three catalyst: **1)** Resilience and Stability, **2)** Digital Innovation, and **3)** Business Optimization.

INVESTMENT SUMMARY

Resilience and Stability

BNY Mellon is a reputable financial services company with a long history of serving customers in the US and Europe. It has multiple business lines, which allows it to spread risk and lessen the effects of downturns in any one particular market. All of BNY Mellon's businesses have been significantly impacted by market volatility, which is caused by the performance of the global equity and fixed income markets, changes in interest rates, and foreign exchange fluctuations. On a relative basis, however, they benefit from increased volatility and a flight to quality compared to other credit-focused financial institutions due to their diversified, lower-risk business model.

To define BNY Mellon's Resilience, we looked at the 2008 Financial Crisis for historical observation, and the recent 2020 Global Pandemic for a rather up-to-date performance.

2008 Financial Crisis. In 2008, as the S&P 500 and MSCI EAFE indices declined by 38% and 45%, respectively, performance fees, investment income from seed capital investments, and wealth management fee re venue all decreased as lower market values partially offset the impact of new business wins.

In spite of the market crash, the market conditions favorably impacted BNY Mellon's business as under:

1) BNY's Institutional Services businesses saw an increase in processing and capital markets-related fees. It's Fee to AUM ratio was relatively high compared to the peer median, which indicated stability during a time when asset values were dropping. This meant that even though BNY Mellon's assets under management were decreasing, the company was still able to generate sufficient revenue from management fees to maintain its operations and meet its financial obligations (Exhibit 1) and also booked a 28% premium over the peer median Net Profit margin in 2008 (Exhibit 2) **2)** The market's instability had also increased the amount of activity affecting foreign exchange and clearing revenue and had caused spreads related to securities lending and foreign exchange to widen. **3)** Lower risk appetites among investors and their institutional clients had caused deposit levels to rise (YoY Growth of 35%), which also resulted in a 28% rise in net interest income. **4)** In order to restore liquidity to the financial markets, governments' stabilization Department of Treasury in October 2008 to serve as the sole supplier of a wide range of custodial and corporate trust services for the Troubled Asset Relief Program (TARP). Additionally, they were employed by the U.S. Treasury Department to handle all cash and assets in the portfolio, provide document custody, and help with other related services.

2020 Global Covid-19 Pandemic. The majority of BNY's business segment's fee revenue was negatively impacted by the increase in money market mutual fund fee waivers that followed the decline in short-term interest rates.
However, despite of all the market disruptions, similar to 2008 *(Exhibit 1&2)*, ***the market conditions favorably impacted BNY Mellon's business as under*** 1) In 2020 compared to 2019, their Investment Services businesses benefited from increased client volumes. 2) The sharp increase in market volatility also led to a rise in foreign exchange client activity, higher asset servicing, higher demand for clearing services at Pershing, and higher revenue from clearance and collateral management fees. 3) The interest rate environment along with the volatility in the market led to an increase in deposit levels (+36%) from the prior year as clients preferred to keep cash with BNY, which also lowered the negative impact of decline in short term interest rates.

Outlook for 2023. 1) The fed will continue to increase the interest rates to gradually lower the inflation rate to the pre-covid levels, 2) There is a high probability of recession in the next twelve months (Exhibit 3).

Given BNY's past performance during times of crisis, we predict that BNY Mellon will be able to maintain a solid performance throughout challenging macroeconomic conditions due to the nature of the business model.

Digital Innovation

When it comes to innovation and trust, BNY Mellon is constantly at the forefront. The business is renowned for its dedication to adopting cutting-edge technology to boost customer satisfaction and increase the effectiveness of its operations. It has a proven track record of p providing cutting-edge solutions to its clients, such as blockchain technology, digital and mobile platforms, and data analytics. BNY is determined to offer institutional clients the same degree of protection and security for their digital assets as they did for their traditional assets. To satisfy the current and future security and compliance demands of customers throughout the digital asset arena, BNY Mellon has been collaborating closely with market-leading fintech Fireblocks and Chainalysis to integrate their technology.

Digital Asset Solutions. **(A) Custody -** BNY Mellon is **the first** large U.S. bank to **custody digital assets** alongside traditional investments on the same **platform.** They had formed an enterprise Digital Assets Unit in 2021 to develop solutions for digital asset technology, with plans to launch the industry's first multi-asset platform that bridges digital and traditional asset custody. In October 2022, BNY launched Digital Asset Custody Platform for BTC and ETH for selected institutional clients in the U.S, with a future goal of developing entire suite of digital assets services: execution, and tokenization.

(B) Fund Services - BNY offers comprehensive solutions that are scalable and adaptable, with the capacity to immediately assess new digital assets and reconcile with significant digital custodians. These services range from accounting and administration to transfer agency and ETF services. Currently, they provide fund accounting and administration for Grayscale Bitcoin Trust as well as assistance for pure cryptocurrency fun ds that accept a variety of currencies besides bitcoin (BTC) and ether (ETH).

(C) Digital tokens - Asset tokenization is a way of digitizing tangible and intangible assets and converting them into tokens, which are then stored on the blockchain. There are several initiatives, notably by incumbent U.S. and European exchanges that are all developing tokenization offerings by turning legacy asset classes, such as corporate securities, into vibrant digital markets. The value chain has been evolving from origination of trading assets to Corporate Trust. BNY is however at a very initial stage in this arena.

Demand for Digital assets. As per 2022 Survey of Global Institutional Clients, Asset Managers, Asset Owners, and Hedge Funds by CELENT, 70% of respondents would increase their digital asset activity if services like custody and execution are available from recognized, trusted institutions. Despite the market downturn, 88% are moving forward with their plans. The study further indicates that almost all institutional investors (91%) are interested in investing in tokenized products. However, after FTX fallout, there has been a watershed moment for digital asset class. Even after the collapse of FTX, we are of the belief that this would not mark the end of the investment interest in digital assets but will prompt a deeper u understanding of nuances within the space between decentralized and centralized exchanges and most importantly, the need for due diligence and proper oversight. BNY has about

Challenges and Mitigants. **Issues at hand:** Considering the recent failure in the crypto world, it is imperative that legislators and regulators increase their efforts and take act. Regulations for blockchain technology should cover a variety of challenges, including A) Security and integrity of the network, B) Privacy and data protection, and C) Consumer protection. Given the nature of complexity of Blockchain Technology, regulators need to ensure that the network is protected from malicious actors, data is protected and that individuals have control over their own data, and consumers are protected from fraud and that they have access to dispute resolution mechanisms if necessary.

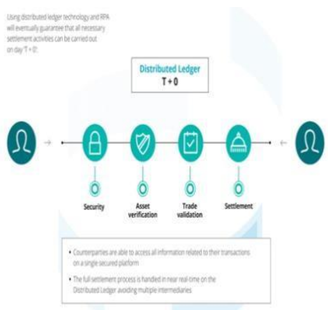
Step Forward: There are several countries that have passed, or proposed laws and regulations related to blockchain technology. Some example s include the European Union's rollout of Market in Crypto Assets (MiCA), UK and Canada's Regulatory Sandbox approach to ensure full compliance and safety of digital products and services, Singapore's Personal Data Protection Act (PDPA), which sets out rules for the collection, use, and disclosure of personal data, including data stored on blockchain networks. The U.S. has yet to pass any comprehensive federal legislation on blockchain, but various states have proposed and passed their own laws on the subject.

BNY's vision for Digital asset space. BNY Mellon CEO Robin Vince stated during the Q4 2022 earnings call that the bank continues to place more of an emphasis on tokenization and distributed ledger technology (DLT) than actual cryptocurrency after introducing its digital custody service in October 2022. The next two years, and maybe the following five, are not anticipated to see widespread use. Although there is no guarantee that traction will occur, BNY Mellon must be present just in case. He said that they will continue to compete in the larger digital asset market, but he anticipates that this will take time to develop and that revenues will be negligible for the next five years.

Given BNY's focus on innovation and expansion and high probability of imposition of regulations in digital asset platform, we strongly believe that Digital assets will contribute substantial amount of revenue for the company after a period of five years from now.

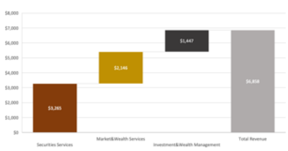
Figure 2: Portfolio Companies

Figure 3: DLT Time Reduction



Source: Deloitte, Company Data

Exhibit 4: Total Revenue



Source: Team Analysis, Company Data

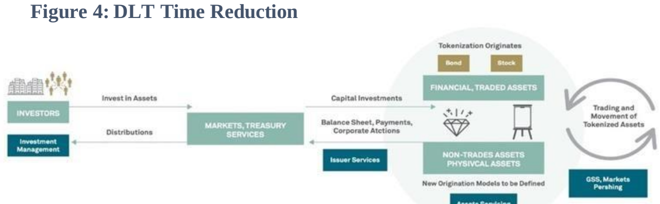
Business Optimization

Robin Vince, CEO of BNY Mellon in 4th earrings calls, highlighted that the key theme for 2023 will be optimizing business, which will be achieved by instilling expense discipline and focusing on more profitable new business. In view of that theme BNY has already started taking steps and laid its foundation in the form of Innovation which will reduce transaction cost, increase operations efficiency, eliminate credit and liquidity risks which will optimize the business of the Bank. BNY Mellon has the scale to reimagine financial markets by using Distributed Ledger Technology (DLT) through following services:

Real time payment. Due to instant payment services provided to households and business around the clock, every day of the year, it will simplify and speed up financial transactions and reduce the costs and fees associated with certain payments transactions for BNY. As a result, we expect the improvement in the operating efficiency by saving service time of processing the non-digital payments and reduction in processing cost by 57% over the period as compared to paper checks and money orders. Furthermore, with save in time and cost, DLT will make the back-office process streamline and automate the transactions which will require less manpower and reduce approximately 3% of staff over the period. (Figure 3)

Tokenization. BNY Mellon is in the early stage of tokenization services, however by employing this blockchain technology, it will eliminate the possibility of threats and frauds which will reduce the need of a middleman lowering the cost of the workforce over a of time and enhance the transaction speed and efficiency of the bank's services. It will also improve the fractionalization of new asset classes and expand the range of available and acceptable collateral beyond traditional assets which holds lot of potential for BNY Mellon's collateral management globally including new asset classes in more efficient manner (Figure 4).

Figure 4: DLT Time Reduction



Source: Company Data

PershingX. Additionally, BNY Mellon will introduce PershingX technology in 2023 in collaboration with Conquest. This financial platform will help BNY's wealth management advisors focus more on business advice and less on data organization, analysis, and technology selection, enhancing both the business' overall operating efficiency and the client's experience. Advisors will have access to a whole financial planning strategy that integrates both goals- and cash flow-based planning thanks to the integrated services. Advisors will provide a personalized experience for clients by combining artificial intelligence (AI), sophisticated analytics, and on-demand client cooperation to boost productivity and enhance the client experience.

With BNYs cointegration between old and new technology, the company is expected to optimize the business through Distributed Ledger Transaction (DLT) system which can make funds transfer and transactions near instantly within 10 seconds instead of current industry standard of two days to make domestic and cross-border payments and settlements faster, more frictionless, efficient, transparent, and cost-effective.

BUSINESS DESCRIPTION

Exhibit 5: Revenue Breakdown per segment

Overview

Founded by Alexander Hamilton, an innovator, the Bank of New York Mellon has been *"at the forefront of change in the financial world for over 230 years"*. Today, BNY Mellon is a global financial services company that provides investment management, investment services, and wealth management, though its three main business segments: Securities Services, Market and Wealth Services, and Investment and Wealth Management, with Securities Services being the largest revenue generator with almost 48% of Total Revenue (Exhibit 4).
and/or administration (AUC/A), and $1.83 trillion in assets under management (AUM). Furthermore, BNY Mellon operates in 35 countries and serves clients in more than 100 markets, touching more than 20% of the world's investable assets.

Business Model

The three main business lines are responsible for generating revenue through two main channels: **1)** fee revenue and **2)** interest revenue. As of 2022, fee revenue accounted for 79.1% of total revenue, while interest revenue accounted for 21.4%. This trend is consistent with the breakdown of revenues by Business segment (Exhibit 5), indicating that exposure to interest rates fluctuations is limited to a smaller portion of overall income. In addition to its core operation, the company also engages in other businesses, including leasing portfolios, securities and derivatives portfolios, and corporate and bank-owned life insurance. Furthermore, BNY Mellon operates in a global capacity, with presence in 35 countries worldwide, with international operations accounting for 38% of its total revenue.

Non-interest revenue. BNY Mellon generates a significant portion of its non-interest revenue through investment services fees, which include a) clearance and settlement fees, b) distribution and servicing fees, and c) custody fees, along with Customer service fees such as d) administration and management fees, e) performance fees, and f) transaction fees. These sources of revenue are dependent on level of client activity and demonstrate the company's ability to provide comprehensive and efficient services to its clients.

Interest Revenue. Additionally, BNY Mellon's interest-earning assets such as deposits with the Federal Reserve and other central banks, as well as their diverse securities portfolio, also play a significant role in generating revenue for the company. Overall, the company's diverse revenue streams and ability to provide various services positions it well for continued growth and success.

Exhibit 6: Top 10 Country Exposure ($bn)

Source: Team Analysis, Company Data

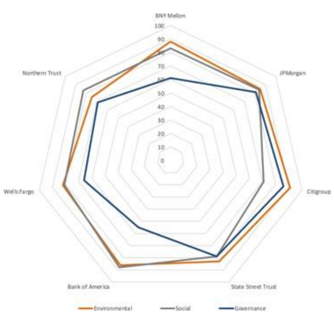
Global Positioning. As per December 2021, the bank's main offshore exposure is concentrated in Germany, with $27.7 billion exposure, followed by the United Kingdom and Japan, with an exposure of $21.6 and $9.4 billion, respectively (Exhibit 6). Most of BK's offshore exposure is in interest-bearing deposits in other countries' Central Banks, while a smaller part in Banks and Securities. For example, 75.8% of the $27.7 billion exposure in Germany are interest-bearing deposits in Germany's Central Bank, and a similar trend repeats for the other offshore exposures (Appendix 5).

ENVIRONMENTAL, SOCIAL, and GOVERNANCE

BNY Mellon makes some efforts to improve ESG parameters, yet, in terms of total ESG Score, BNY is rated 12th, trailing their competitors. Despite BNY Mellon's strength in the Environmental and Social Pillars, we feel there is still room for improvement in the Governance Pillar.

Over the past five years, the company has maintained an average ESG score of 70.30 and a median score of 69.09. Compared to its peers, BNY Mellon demonstrates superior performance in the Environmental and Social pillar but lags in the Governance pillar.

Exhibit 7: ESG total Score BK vs Peers



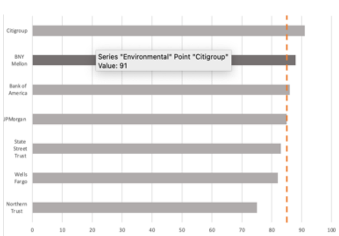
Source: Bloomberg data, Team Analysis

In order to evaluate the effect of negative or controversial news on the company's and its peers' ESG scores, we conducted a comparison of the combined ESG score and the individual ESG score. Our analysis revealed that, in comparison to its peers, BNY is less frequently involved in ESG-related controversies (Exhibit 7).

Environmental. In line with the Science Based Targets (SBTi) methodology, BNY Mellon intends to reduce by 20% data centers greenhouse gas emissions (GHG) from the base year of 2018 and to maintain its commitment to Carbon Neutrality. Additionally, the company aims to achieve zero waste to landfills for technology equipment and divert 80% of office waste from landfills. BNY also plans to achieve paper neutrality in India and the United States, and to reduce water usage in construction operations.

BNY has made significant progress in achieving its Enterprise ESG 2025 goals over the past year. Despite some expected normalization beginning in 2022 and beyond, the COVID-19 pandemic and the subsequent shift to remote work resulted in a significant decrease in emissions, waste, and water consumption. The company has reduced direct emissions from owned or managed sources and indirect emissions from purchased energy by an additional 12% in 2021 and by a total of 36% as of 2021. BNY has maintained its commitment to carbon neutrality since 2015 and adopted the concept of paper neutrality in India and the United States in 2017.

Exhibit 8: Environmental Pillar BK vs Peers



Source: Team Analysis

Regarding waste management, BNY has achieved a 75% diversion rate for office waste from landfills and a reduction in water usage of 60% from its baseline in 2015. BNY Mellon is not only focused on aligning the company's operations with environmental and climate change-related issues but also the clients' portfolios and investments. As of 2021, the company has increased the number of RI funds to 27, grown assets managed by UN PRI signatories by 5.3% to $1.931 trillion, and administered 169 new sustainable, social and green bond issuances, totaling $89 billion, making it one of the leading trustees in green bonds by deal volume for the second consecutive year.

Social. BNY Mellon's ESG Social score of 83.17 (Grade A-), which is slightly above the average of its peers at 81.29 (Exhibit 7), reflects the company's commitment to diversity, equity, and inclusion (DEI), Consumer data protection policy and Corporate Funding.

Exhibit 9: Dimensions of BNY Mellon's commitment to DEI as per Dec 31st, 2021Exhibit 10: Dimensions of BNY

People with Disabilities	LGBTQ+	Veterans
5.1% U.S. Workforce	1.5% U.S. Workforce	1.8% U.S. Workforce
0.3% UK Workforce	2.0% UK Workforce	0.0% UK Workforce

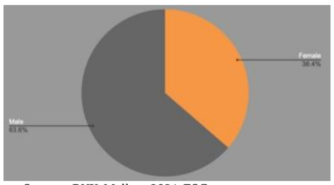
Source: BNY Mellon 2021 ESG report

Commitment to DEI (Exhibit 9)**.** On Disability Inclusion, in 2021, BNY Mellon Achieved 100% on the Disability Equality Index and was named the Best Place to Work for Disability Inclusion. BK is also a leader in the *Inclusive* Workplace area, being ranked 15th among the top 20 *Fortune 500 Companies on diversity and Inclusion*. Furthermore, it achieved 100% on the *HRC Corporate Equality Index*, and was named a Best Place to Work for LGBTQ+ Equality. The bank's progress in advancing women in leadership was recognized in 2021, when four BNY Mellon's leaders and employees were included in *American Banker's 2021 Most Powerful Women program* and *2021 HERoes Women Role Models* Lists. Moreover, 2022 was the first year BK got included in the *Bloomberg Gender-Equality Index*, signaling material progress towards Gender Diversity issues. Additionally, the bank is making progress in DEI topics not only in the U.S. but around the world, being signatory of initiatives such as the *Association of Business Service Leaders' #WorkingTogether Pledge* (Poland) and *Valuable 500*.

Exhibit 10: Percentage & growth of female on Board

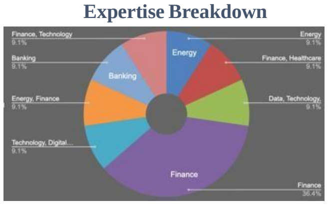
Source: BNY Mellon 2021 ESG report

Exhibit 11: Current percentage of female on Board



Source: BNY Mellon 2021 ESG report

Exhibit 12: Overall Industry Expertise Breakdown



Source: BNY Mellon 2021 ESG report

Consumer data protection policy. As cyber threats become more sophisticated, BNY is protecting its business with high levels of cybersecurity. The Bank of New York Mellon Corporation's Information Security Management System is approved by the British Standards Institution (BSI) Group and got recertified for a 3-year cycle of ISO 27002:2013 in 2021 and is currently conducting feasibility analysis of ISO27701:2019.

Privacy Information Management System (PIMS). Drivers of BK's Cybersecurity's Program are its Threat Intelligence team, 24/7/365 monitoring and Employee Education, key to build a competitive level of workforce awareness.
Corporate Funding, and other giving. In 2021, BNY Mellon community support totaled $34.5 million. This funding includes $3 millions of employee giving, raised thanks to a successful Giving Tuesday global campaign. $17.4 million were invested in Corporate Grants and Scholarships, mainly to create career pathways in business, technology, and STEM, and $8.1 million in Foundation Giving.

Governance. BNY Mellon's prior performance has been poor, and we believe this is partly due to a lack of leadership framework to direct staff toward success. However, in recent years, the Leadership Structure of BNY Mellon has undergone significant restructuring recently. We believe this to be a sign of renewal and rebranding. They recently established "*ONE BNY Mellon*", an initiative that mobilizes cross-functional leadership teams in key regions to improve organizational cooperation and create a consistent market presence. Their mission is to promote information sharing and cross-company customer recommendations in order to deliver comprehensive solutions and improve relationships with their top providers. We consider this as an early phase of exponential growth, not just in Corporate Governance but also from a financial perspective.

Board of Directors: The median tenure of the eleven members of the BNY Mellon board, who have knowledge and experience in a range of important sectors, is 2020, signaling a relatively new board structure. 27% of the board members are from underrepresented racial backgrounds, and 36% of the board members are women (Exhibits 11 & 12). We believe these numbers have improved and will improve in the future. The board of directors' expertise spans a wide range of industries, including Technology (Cybersecurity, Data), Risk Management and Global Banking, Regulatory and Compliance, and Global Business Development (Exhibit 12), and we are confident that this will help bridge the gap between the old and the new, and further improve BNY's governance pillar score.

BNY Mellon's shattered reputation will be restored by a new leadership structure: The past rules made against BNY Mellon do provide a glimpse of the lack of leadership BNY had. The SEC determined that BNY had misled investors and the general public by claiming that every investment undergoes an ESG review, even though this was untrue. Furthermore, according to German officials, BNY Mellon participated in a scheme known as a "Cum-ex," which allowed numerous parties to fraudulently claim tax refunds on dividends by quickly trading shares of firms around the time of their dividend release. Both events caused BNY Mellon to suffer financial and reputational losses, and we think this is one instance where new members will need to face recovering a damaged reputation.

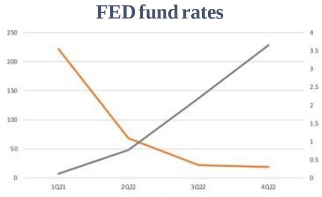
INDUSTRY OVERVIEW and COMPETITIVE POSITIONING

Industry Overview

Exhibit 13: Top 3 Custodian by AUC/A

Source: Team Analysis, Company Data

Exhibit 14: BK fee waivers vs FED fund rates



Source: Team Analysis

Global Custody Industry. The global custody industry is responsible for the safekeeping and administration of securities, such as stocks and bonds, on behalf of institutional investors. This encompasses a range of function, including record-keeping, cash and securities settlement, and proxy voting. The market for custody services is highly competitive, with numerous banks providing custody services in addition to other banking services. Moreover, traditional players in securities services are experiencing increasing competition from Central Securities Depositories (CSD) and Central Counterparty Clearing Houses (CCP). The main players by AUC/A are: BNY Mellon, leading the ranking, followed by Northern Trust, State Street Corporation, and JP Morgan (Exhibit 13). The main topics in the industry are Automation and Standardization, to improve efficiency and implementation of Digital Asset Custody Services.

- **Automation and Standardization.** The focus in the industry is towards the automation and standardization of core custody services and operations primarily to enhance productivity, reduce cost for customers, improve quality of service, while allowing the custodian to react quickly to future needs. In the coming years, the asset-centric model is expected to be augmented by a more data-centric, open platform method. These features are expected to drive the growth of the custody services market, which is expected to grow to $53.27 billion in 2026 at a compound annual growth rate (CAGR) of 8.7% *(Source: Global Custody Service Market Report 2022)*.
- **Digital Asset Custody Services.** The digital asset market has grown significantly in recent years, with the total value of all existing cryptocurrencies currently estimated at $804 billion. This growth has created new opportunities in the digital asset custody industry, as more institutional investors and financial institutions become interested in investing in digital assets. According to a recent survey conducted by Celent, 91% of institutional investors are interested in investing in tokenized products, with 41% already holding digital assets in their portfolios, and an additional 15% planning to hold digital assets in the next two to five years. This strong demand from institutional investors, corporations, exchanges, and individuals, as well as the emergence of new opportunities in areas such as Stablecoins/CBDC, Tokenization, are driving the growth of the digital asset custody services market. BNY Mellon is one of the first traditional banks to offer digital asset custody services, launching its platform in October 2022.

Financial Services. BNY Mellon is active in Investment and Wealth management, related to Asset Under Management (AUM). In 2022, total AUM hit an all-time high of $126 trillion at the start of 2022, but total AUM in the Industry is likely to decrease, mainly due to rising interest rates. The current trends in Asset Management include downward pressure on fees: no asset manager is increasing fees, but reducing them, or using market fee waivers. These fee waivers have been a big headwind for BK's revenues starting in 2020 (in 2021 the net cost of market fee waivers amounted to $961 million) but are expected to continue their decrease with the increase in interest rates by FED (Exhibit 14).

Exhibit 15: Securities Servicesfee in 4Q22

Source: Team Analysis, Company Data

Main drivers in Investment and Wealth Management are digital transformation, increasing employee satisfaction, and Culture.

Digital Transformation. Implementation of new technologies to improve the client experience, but also aim to increase communication across departments and reduce infrastructure costs by 30-50%, as per PwC estimates. With the increasing interest in crypto assets, the Financial Stability Board (FSB) is recommending an intensive use of distributed ledger technology (DLT). DLT can help lower expenses both through automation of processes (e.g., reconciliation and settlement) and reducing the need for intermediaries, lowering transaction costs.

Increasing employee satisfaction. For its nature, investment management sector is talent-driven and, as a result, firms are updating their workplace policies to increase employee satisfaction.

Culture. Leaders who engrain a sense of purpose throughout the organization take a meaningful step to success on many levels.

Exhibit 16: BK total interest income vs BK net fee revenue

Source: Team Analysis, Company Data

Competitive Positioning

Custody services dominance: BNY Mellon is a leading player in the custody services industry, holding the top spot in terms of assets under custody/administration (AUC/A) with a total of $44.1 trillion as of 4Q22. The company is followed closely by State Street Corp. with $36.7 trillion, and JP Morgan Chase with $27.2 trillion (Exhibit 13). A similar ranking is seen in Securities Services fees (Exhibit 15).

The primary advantages of BNY Mellon are its well-established reputation and diversified product offering. Indeed, in addition to its long history, dating back to the 18th century, in 2022 BK has been named one of the most admired companies in the world according to Fortune Magazine for the 25th time since 1997 and won the Banker's Global Transaction Bank of the year 2022 solidifying its position as a leader in the industry and affirming its reputation for providing exceptional custodial services.

Exhibit 17: CPI YoY % in US, Eurozone,

Source: BNY Mellon 2023 Market Outlook

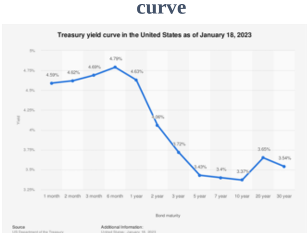
Furthermore, BK's diversified revenue streams, with a significant emphasis on more stable, fee -based income sources accounting for 79.1% of total revenue, as opposed to interest-based sources at 21.4%, provide a strong foundation for the company's ongoing growth and stability, mainly due to a reduced dependence on external factors (i.e., FED interest rate) (Exhibit 16). This diversification strategy allows the company to minimize the impact of market fluctuations on its revenue and to capitalize on a wider range of opportunities.

Increasing competition from non-traditional players: Traditional custodian banks have been experiencing higher competition from non-traditional players, primarily because of the increasing automation of securities services transactions and the regulatory push to increase transparency and reduce risk in securities transactions.

- Central Counterparties (CCPs) are becoming an increasingly important part of the financial system, as regulators have been pushing for an increase in the use of clearing houses to reduce risk in financial markets.
- Central Securities Depositories (CSDs) have been able to offer competitive services thanks to the increasing in transactions automation.

With the emerging of new players, Custodian banks are adapting to the increased competition by investing in technology (e.g. BNY Mellon is implementing a more data-centric open platform) and developing partnerships with CSDs and CCPs (e.g. BK Sponsored Membership, that allows clients to avoid the responsibilities and obligations of full CCP membership).

Exhibit 18: Treasury Yield curve



Source: US Department of the Treasury

Market Dynamics | Riding the Interest Rate Wave

Mild global recession. Despite the challenges posed by high inflation, as evidenced by spikes in the Consumer Price Index (CPI) and multiple rate hikes, the U.S. economy has demonstrated resilience. This can be attributed to a robust labor market, characterized by high wages and employment, as well as a significant accumulation of savings for $1 trillion as a result of the Pandemic, that made consumer spending the driver of U.S. growth. However, data from November 2022 revealed a slowing of the CPI for two consecutive months, indicating that inflation has reached its peak (Exhibit 17). BNY Mellon 2023 Outlook expresses concern that certain inflationary pressures, specifically those related to labor and housing costs, may prolong the tight monetary policy stance, and ultimately lead to a mild recession, despite easing inflation and the slowing pace of FED's tightening.

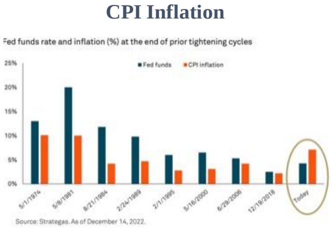
Exhibit 19: FED Fund Rates selected during FOMC meetings

FOMC Meeting Date	Rate Change (bps)	Federal Funds Rate
Dec 14, 2022	+50	4.25% to 4.50%
Nov 2, 2022	+75	3.75% to 4.00%
Sept 21, 2022	+75	3.00% to 3.25%
July 27, 2022	+75	2.25% to 2.5%
June 16, 2022	+75	1.5% to 1.75%
May 5, 2022	+50	0.75% to 1.00%
March 17, 2022	+25	0.25% to 0.50%

Source: FRED website

Furthermore, an inverted Treasury Market yield curve is a strong indicator of a recession. As of mid-December, the yield curve was more inverted than it has been since the early 1980s, accordingly to BNY Mellon 2023 Outlook (Exhibit 18).

Exhibit 20: FED Fund Rates vs CPI Inflation



Source: BNY Mellon 2023 Market Outlook

On a Global perspective, the Eurozone's growth exceeded expectations despite high inflation (10%, as indicated by CPI), but it is predicted to experience a recession in Q1 2023. On the other hand, China's growth is projected to improve, largely due to the lifting of its zero-Covid policy.

Hawkish Central Banks. In December 2022 the FED increased interest rates to 4.50%, from a 4.25% level, signaling a slower tightening pace, if compared to previous months rate change (Exhibit 19). As observed in BNY Mellon's 2023 Market Outlook, in prior hawkish periods, the rate cycle ended when the federal funds rate was greater than the inflation rate (Exhibit 20). During December, the inflation rate was 6.5%, 2.50% above the FED's funds rate of 4%, thus further interest rates increases are expected.

Persistent inflation. After an expected market rate peak at 5%, market consensus has priced interest rates cuts by the third quarter of 2023, while BNY Mellon thinks Central Banks will shift into a holding pattern. The effect of this hawkish policy will become clear by the end of 2023, when BNY Mellon Wealth Management forecasts a drop of Inflation rate (CPI) to 4% to 5%, well above the post-global financial crisis level of near 2%.

Exhibit 21: Valuation Matrix

Valuation Matrix		
Method	Weightings	Implied Share Price
Relative Valuation	50.00%	$59.34
Residual Income Model	30.00%	$51.68
Dividend Discount Model	20.00%	$84.90
Target Price	**$62.15**	
Premium/Discount to last close	24.16%	

Source: Team Analysis

Exhibit 22: Valuation Assumptions

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%
Cost of Equity	**6.23%**	**3.59%**
Terminal Growth rate	**2.64%**	

Source: Team Analysis

VALUATION

Valuation | **Summary**

Our target price of **$62.15** per share was determined through the combination of 3 models: Dividend Discount Model (DDM), Relative Valuation, and Residual Income Model (RIM) with weights of 20%, 50%, and 30% respectively (Exhibit 21). The implied share price was determined through a triangulation of the results from each model. The CAPM Model was used to calculate the cost of equity using 3-Month Treasury Bill Yields for the forecast period and the long-term 10-year forecast for the terminal cost of equity (Exhibit 22). The terminal growth rate was calculated through a cross-weighting of factors such as Weighted Average GDP Growth, Long-Run Inflation Rate, and Long-Term Banking and Custody Industry Growth (Exhibit 23)

Exhibit 23: Valuation Terminal Growth Rate Estimate

Terminal Growth Rate Estimate	Forecasted	Weights
Weighted Average GDP Growth Rate	3.13%	30.00%
Long Run Average Inflation	3.00%	30.00%
Long Term Banking & Custody Industry Growth	2.00%	40.00%
Terminal Growth Rate	2.64%	

Source: Team Analysis

Valuation | **Residual Income Model (RIM)**

We used a two-stage Residual Income Model with a forecast cost of equity of 6.23% and a terminal cost of equity of 3.59%, assuming a terminal growth rate of 2.64% in a 5-year time frame to minimize forecast errors. The Residual Income Model measures a bank's profitability beyond its financial obligations and preferred dividends and compares it to the cost of equity to evaluate if the stock price is justified. We estimated the terminal residual income using the perpetuity growth formula and calculated the Residual Income by subtracting the cost of equity from the Return on Equity and multiplying by shareholder equity. The model resulted in an implied share price of **$51.68**, which reflects a 3.24% increase from the latest closing price of $50.06 (Exhibit 24).

Exhibit 24: Residual Income Model Output

Residual Income - Base Case	
Residual Income Terminal Value	-$4,256.88
Current Shareholder Equity	$40,741.00
PV Terminal Residual Income	-$3,142.26
Sum of PV Residual Income	-$1,165.18
Equity Value	**$36,433.56**
Implied Share Price	**$51.68**
Premium/Discount to last close	3.24%

Source: Team Analysis

Valuation | **Relative Valuation**

Our Relative Valuation showed an implied share price of **$59.34** (+18.53% premium), derived from analysis of P/E and P/BV multiples of comparable financial institutes that have similar operating models and capital structures (Exhibit 25). Equity multiples were favored for valuing banks as enterprise values and EBITDA are hard to calculate due to the nature of debt for financial institutions. Although P/E is a common method of Relative Valuation, we believe that current earnings are lower than normal and therefore gave a 70% weighting to the P/BV FY1 due to its low sensitivity to market conditions. P/BV is also more relevant for financial services firms as banks' assets and liabilities are subject to regular market adjustments. The Forward P/E was estimated to be at a 5% premium, higher than its peer median of 10.15x, while the P/BV was forecasted to drop below 1.0x, indicating a potential discount.

We anticipate that BNY's P/E premium will narrow in the future as the financial industry faces potential crisis headwinds in 2023. Despite this, we believe that BNY will perform well due to its strong business and revenue model.

Exhibit 25: Relative Valuation Output

Relative Valuation		
Company	P/E FY1	P/BV FY1
Bank of New York Mellon Corp	10.70	0.99
State Street	7.60	1.26
JP Morgan Chase	9.30	1.44
Northern Trust	11.00	1.81
BlackRock	18.00	3.00
Median	10.15	1.63
Weightings	30%	70%
Implied Share Price	**$59.34**	
Premium/Discount to last close	18.53%	

Source: Team Analysis

Valuation | **Dividend Discount Model (DDM)**

We believe the Dividend Discount Model is a suitable approach for valuing BNY Mellon due to its strong dividend yield and growth history, and capital regulations. The bank has maintained a strong dividend growth record since the Global Financial Crisis. Our calculation used a two-stage DDM Model with the same cost of equity and terminal growth rates and checked that its DPS complies with capital regulations. Although BNY Mellon's recent $5B share repurchases slightly decreased its 2023 DPS, this did not impact the model or future forecasts. The DDM model resulted in an implied share price of **$84.90**, which is a 70% premium over its last closing price of $50.06 (Exhibit 26).

Exhibit 26: Dividend Discount Model Output

Dividend Discount Model - Base Case	
Terminal Value of Dividends	$106.22
PV of Terminal Dividends	$78.52
SUM of Forecasted Dividends	$6.38
Implied Share Price	**$84.90**
Premium/Discount to last close	69.60%

Source: Team Analysis

FINANCIAL ANALYSIS

Financial Analysis | Profitability

BNY Mellon's financial outlook is positive, with a **P/BV ratio** of 1 indicating a fair valuation for the company's assets. We do note that company's **P/E ratio** is slightly below its peer median, however, we believe the current P/E ratio is not an accurate reflection of the company's long-term growth prospects, primarily due to high dividend yield (5.26% premium over peer). This dividend premium might suggest that it could be a more attractive choice for investors, particularly considering the market performance in 2022 and outlook.

BNY Mellon's current return on equity (**ROE**) might be lower compared to other companies, but its focus on cost reduction and a robust business strategy are promising for a stable and strong ROE in the future. This cost reduction strategy is a positive step towards increasing profitability and maximizing shareholder value and will likely be reflected in future financial performance.

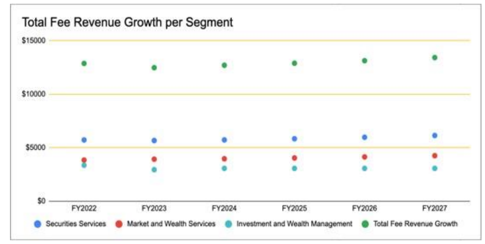
Exhibit 27: DDM Scenarios for Payout Ratio and Cost of Equity

		Terminal Ke				
		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

Additionally, BNY Mellon's superior **Net Profit Margin** relative to competitors demonstrates its strong financial performance and profitability (Exhibit 2). Under the leadership of an effective CEO, BNY Mellon is taking steps to stay ahead of the expense curve in the financial services industry. Overall, with the multitudes of factors mentioned above (*fair valuation, a potential discount in stock price compared to peers, strong potential in ROE, strong net profit margin, proactive cost management, and innovative technology initiatives*) all contribute to a positive financial outlook for BNY Mellon (Exhibit 29).

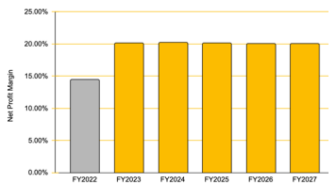
Exhibit 30: Total Fee Revenue per Segment



Source: Team Analysis

Forecasting **Total revenues** for the 5-year period, we estimate a CAGR of 2.57% compared to historical 5-year growth of 0.5% CAGR (Exhibit 29). Total **Fee revenue** per segment is projected in Exhibit 30.

Exhibit 28: Expected Net Profit Margin Growth



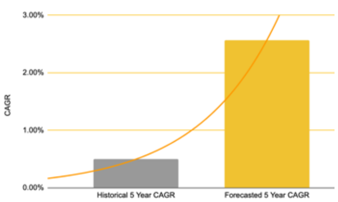
Source: Team Analysis

Financial Analysis | Asset Quality

BNY has sustained a strong financial standing with minuscule YoY variation in liquid assets, demonstrating stability and sound financial management. The decrease in loan operations and investment decrease can be attributed to the difficult market circumstances in 2022, as well as preparation for a potential 2023 recession. BNY's capability to manage these conditions while keeping its liquid assets steady is a positive sign of its overall financial wellbeing.

BNY Mellon showed strong financial acumen with its successful Q4 2022 securities repositioning. This move significantly enhanced the creditworthiness of its securities portfolio, boosting the assets rated AAA/AA- from 96% to 99% (Exhibit 31). Additionally, BNY Mellon significantly reduced its exposure to lower-rated bonds, nearly eliminating BBB+/BBB- and below. The greatest transformations were observed in Corporate Bonds and Sovereign Debt (-100% and -73% respectively). Furthermore, according to Fed's statistical release, BNY Mellon is ranked higher than its peer in terms of their consolidated assets. These advancements highlight BNY Mellon's dedication to managing its portfolio in a responsible and efficient manner for the advantage of its clients.

Exhibit 29: Historical vs Forecasted Total Revenue CAGR



Source: Team Analysis

Financial Analysis | Capital Management

BNY Mellon's financial structure is sound, in our view. As of December 2022, the firm had a common equity Tier 1 ratio of 11.20%, comfortably exceeding its regulatory minimum of 8.5% and stressed capital ratio minimum of 10.9% , which ensures financial stability and protection of client's assets. The firms tier 1 capital as of Q4 of 2022 was 14.2% which is also meaningfully above the minimum stress ratio requirement of 13.7% indicating bank's high-quality, permanent, and easily realizable assets that can be used to support the bank's operations and absorb losses in case of financial stress. BNY's average LCR is 111.81% as per Q4 2022 results i.e.,11.81% above its regulatory minimum, indicating that it holds high-quality liquid assets equal to or greater than its expected net cash outflows over a 30-day stress scenario which is a sign of a strong liquid position.

Exhibit 31: Credit Ratings of Securities Portfolio

Credit Rating	AAA/ AA-	A+/ A-	BBB+/ BBB-	BB+ and lower	A1+/ A2 & SP-1	Not rated
% of Securities Portfolio	99%	1%	0%	0%	0%	0%

Source: Company data

Exhibit 32: Large Bank Capital Requirements for BK

Bank	Minimum CET1 capital ratio	Stress capital buffer requirement	G-SIB surcharge*	CET1 capital requirement
BNY Mellon Corporation	4.5	2.5	1.5	8.5

Source: FRED

INVESTMENT RISKS

Operational Risk

Errors in Operational and Transaction processing. The main source of Operational risk for BK lays in internal errors or delays in the processing of transactions, as well as those of third parties with which the company conducts business. Indeed, the company handles a high volume of transactions daily ($10 trillion of cleared securities and $2.3 trillions of payments), which can involve a diverse array of parties, jurisdictions, and regulations. While the use of manual processes may increase the likelihood of human errors, malfeasance, and fraud, the increasing integration of automation and Artificial Intelligence (AI) can amplify the consequences of any errors or delays, as a swift response is crucial to avoid a drop in speed and volume of transactions.

Mitigant: BK has implemented comprehensive policies and an internal control framework to establish a robust operational environment. The Corporate Operational Risk Management (CORM) function, as an independent second line function within the organization, promotes ongoing improvements in controls. Within CORM, BK has established a Technology Risk Management function, with a focus on operational resiliency. This includes the implementation of a Business Services Framework, which is overseen by Resiliency Risk Management, to ensure effective IT Asset Management, Disaster Recovery Testing, and business Continuity Capabilities. Moreover, BK focuses also on resiliency of its most important service providers.

Cybersecurity Incidents. The advancement of technology solutions, as well as the Covid-19 Pandemic, have increased the reliance on remote work arrangements and the use of mobile and cloud technologies. BNY Mellon is embracing this trend by incorporating technology into its operations, particularly in the Digital Assets Custody market, which heavily relies on technology infrastructure. Additionally, BNY Mellon's global presence includes countries that may not have the same level of protection for intellectual property and proprietary information as the U.S, which could pose a risk for theft of data and technology.

Mitigant: The New York State Department of Financial Services (NYDSDFS) requires financial institutions regulated by NYDSDFS to establish a cybersecurity program, adopt a cybersecurity program, and have policies and procedures in place to ensure the security of information systems and non-public information. In November 2021 a rule was added requiring notification of significant computer security incidents within 36 hours. BK was required to comply with the rule by May 1, 2022.

Market Risk

Changes in interest rates and inverted yield curve. BK's net interest revenue originates from the difference between interest-earning assets (i.e., loans BK offers and securities in portfolio) and interest expense originating from interest-bearing liabilities (i.e., deposits and borrowed money). The economic outlook for 2023 (discussed in "Market Dynamics" section) shows an ongoing increase in interest rates by FED to fight inflation, as well as a current inverted yield curve.

The risks for BNY Mellon include:

- **Negative impact on net interest margin** (NIM). NIM is sensitive to changes in the spread between short-term and long-term interest rates, thus it is negatively impacted when the yield curve flattens or inverts. The current inverted yield curve may negatively impact BK if they are unable to replace higher-yielding maturing assets, with assets of comparable yields.
- **Less liquidity in bonds and fixed-income funds**. The increasing interest rate projected for at least all of 2023 is likely to result in a decrease in liquidity for bonds and fixed-income funds since the fixed coupon payments on existing bonds becomes less attractive compared to new bonds leading clients to reposition their investments. This can lead lower performance, yield and fees for BK.

Mitigant: As of 2022 BK fee revenue accounted for 79.1% of total revenue, while interest revenue accounted for 21.4%, indicating that exposure to interest rates fluctuations is limited to a smaller portion of overall income.

Credit Risk & Liquidity Risk

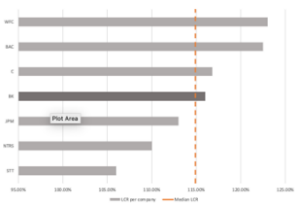
Credit Risk. BNY Mellon's core operations of clearing and financing, custody services and securities lending services expose it to clients and counterparties in many different industries, particularly financial institutions, clearing organizations and governmental entities both inside and outside the U.S.

Risk factors for BNY include, but are not limited to:

- **Operational credit exposure**, which refers to intraday credit extended by the Securities Services and Market and Wealth Services segments.
- The **Agency Securities Lending program**, in which BK acts as an agent on behalf of its clients (securities lenders), involves the lending of securities which are collateralized by cash provided by securities borrowers. BK usually invests this cash in reverse repurchase transactions, leading to counterparty risk exposure towards both securities borrowers and repo counterparties.
- **FX and derivative products** that are used for trading and interest rate management. BK could incur a loss on a derivative contract if interest rates move in its favor and the counterparty defaults. Moreover, some derivatives are centrally cleared, which means that BNY Mellon does not have direct exposure to the counterparty, but instead to a central counterparty (CCP).
- Higher **concentration** of their client and counterparty risk after the consolidation and failures of FI during 2002 financial crisis.
- Direct exposure consisting of extensions of **secured and unsecured credit** to clients.

Mitigant: Operational credit exposure is short-term exposure and is linked to products that have low historical credit losses. Moreover, they only occur when two events happen at the same time: 1) the transaction fails, resulting in an extension of credit, and 2) the counterparty defaults. BNY engages in Risk Management activities to limit counterparty risk, including centrally cleared trades, review of country-level risk concentrations, active hedging of CVA risk and legal agreements (i.e., Master netting agreements – permits effective offsets to negatively valued trades existing with the counterparties). (Appendix 1)

Exhibit 33: BK LCR standing vs peers



Source: Team Analysis

Liquidity Risk. BNY's Mellon operating model and overall strategy heavily rely on their success in accessing financial market utilities and global capital markets. Various factors can threat BK's liquidity position, including funding mismatches and exposure to credit and market risks. Moreover, failure to meet any capital liquidity requirements (i.e., LCR, NSFR) could lead higher FDIC assessments and consequently have reputational business consequences.

Mitigant: As per 3Q22, BK shows adequate capital liquidity requirements, when compared to its peers (Exhibit 33), with a 116% LCR and its high-quality liquid assets (HQLA) (Appendix 2.1) are sufficient to cover potential outflows in the event of an LCR liquidity stress. Moreover, BK can count on the ability to access the capital markets of favorable terms, mainly thanks to credit ratings of its diversified funding sources (Appendix 2.2).

APPENDIX (1) – Counterparty Risk mitigants

BNY Mellon's counterparty risk is composed of two distinct elements: Counterparty default risk and CVA risk. Counterparty default risk arises when a trading counterparty is unable to fulfill its contractual obligations, while CVA risk arises from a broad-based deterioration in credit quality across the bank's trading counterparties, which can result in a material loss of market value.

To mitigate these risks, BNY Mellon employs a comprehensive risk management strategy that includes executing legal agreements with a wide range of counterparties, especially for its FX and derivative trading activities. The most used type of legal agreement is the master netting agreement, that is usually based on either of two documents: the International Swaps and Derivatives Association (ISDA) Master Agreement or Foreign Exchange and Currency Option Master Agreement. Moreover, within an agreement, can be identified:

- a Credit Support Annex (CSA), establish rules for the posting of variation margin collateral against the market value of open trades. This can also take the form of trade-specific collateral, that requires an initial cash/security posting to cover potential future exposure of a trade.
- Additional Termination Events that allow the bank to force a counterparty to immediately cash-settle the current market value of all open transactions in the event of a credit rating downgrade.

APPENDIX (2) – Liquidity Risk Mitigants

Since 2015, the Federal Reserve and the Office of the Controller of the Currency (OCC) have required banks to submit reports on their liquidity positions, including the LCR and HQLA, to evaluate the bank's liquidity risk and identify potential vulnerabilities. As of September 30th, 2022, BNY Mellon reported an LCR of 116%. In addition, the bank's HQLA breakdown consisted of $130.5 billion of Level 1 HQLA, primarily made up of deposits with central banks, U.S. Treasury securities, and securities issued by non-U.S. sovereigns, and Level 2 HQLA mainly composed of U.S. agency mortgage-backed securities.

2.1) Liquidity Requirements | LCR Disclosure

Liquidity Coverage Ratio **July 1, 2022 to September 30, 2022** *(in millions)*		**Average Unweighted Amount**	**Average Weighted Amount**
High-Quality Liquid Assets *(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	-	-
Cash Outflow Amounts			
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	-	-
19	**Total Cash Outflow**	**$367,952**	**$155,755**
Cash Inflow Amounts			
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	-	-
28	**Total Cash Inflow**	**$66,907**	**$40,864**

		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.

2.2) BNY Credit Ratings | 2021 Annual Report

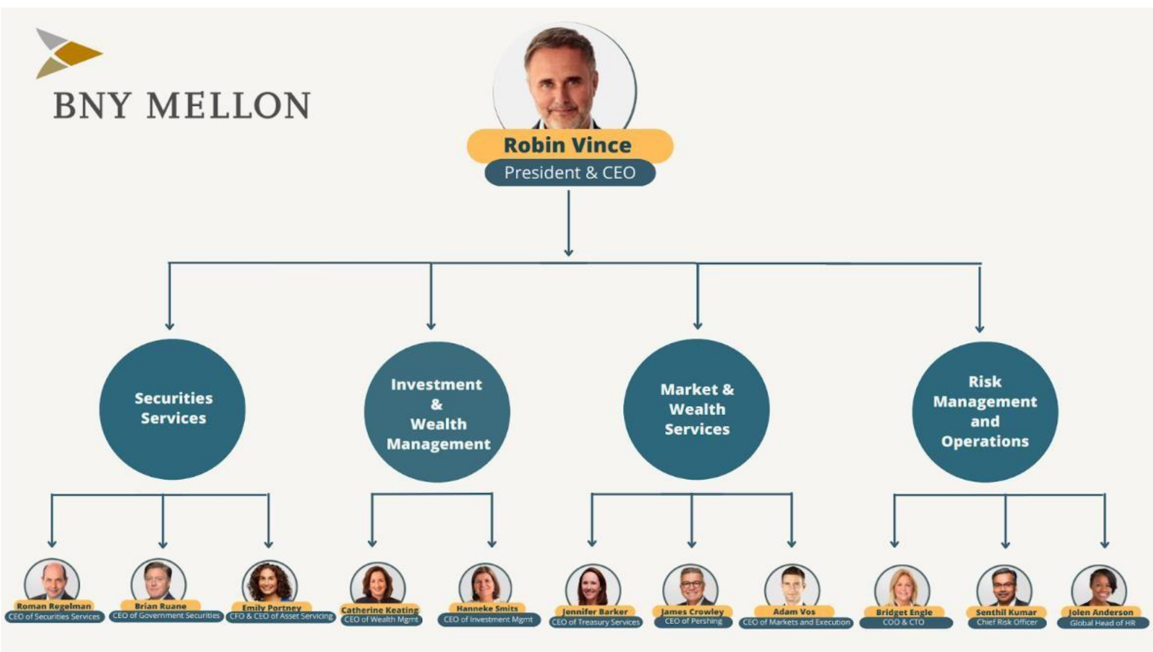
Credit ratings at Dec. 31, 2021	Moody's	S&P	Fitch	DBRS
Parent:				
Long-term senior debt	A1	A	AA-	AA
Subordinated debt	A2	A-	A	AA (low)
Preferred stock	Baa1	BBB	BBB+	A
Outlook – Parent	Stable	Stable	Stable	Stable
The Bank of New York Mellon:				
Long-term senior debt	Aa2	AA-	AA	AA (high)
Subordinated debt	NR	A	NR	NR
Long-term deposits	Aa1	AA-	AA+	AA (high)
Short-term deposits	P1	A-1+	F1+	R-1 (high)
Commercial paper	P1	A-1+	F1+	R-1 (high)
BNY Mellon, N.A.:				
Long-term senior debt	Aa2 *(a)*	AA-	AA *(a)*	AA (high)
Long-term deposits	Aa1	AA-	AA+	AA (high)
Short-term deposits	P1	A-1+	F1+	R-1 (high)
Outlook – Banks	Stable	Stable	Stable	Stable

(a) Represents senior debt issuer default rating.
NR – Not rated.

Source: BNY Mellon Liquidity Disclosure for 3Q22

APPENDIX (3) – Corporate Governance

3.1) BNY Organizational Chart



Source: Company data

3.2) BNY Mellon Board Composition

	Name	Position	Member Since	Gender	Number of Shares as of latest filing	Value of Share (Dec 2022)	Independent	Sectors Expertise	Skills and Expertise
	Linda Cook	Member	2016	Female	22,457	$1,022,247	Yes	Energy	International business operations experience at a senior policy-making level of a large, complex company Expertise in financing, operating and investing in companies Extensive service on the boards of several large public companies in regulated industries
	Joseph Echevarria	Member/Chair	2015	Male	43,971	$2,001,573	Yes	Finance, Healthcare	Leadership of a large, global company Financial expert, with expertise in accounting, regulatory and compliance issues Senior level policy-making experience in the field of professional services
	Amy Gilliland	Member	2021	Female	8,022	$365,168	Yes	Data, Technology,	Expertise in Information Technology and cybersecurity Experience in strategic planning and overseeing business combinations Leadership experience in the operations of a global technology company
	Jeffrey Goldstein	Member	2014	Male	30,379	$1,382,853	Yes	Finance	Experience in private equity Expertise in the operations of large financial institutions Experience in financial regulation and banking
	Guru Gowrappan	Member	2021	Male	8,022	$365,168	Yes	Technology, Digital Media	Expertise in the integration of digital and mobile technologies in advertising and media, including eCommerce, payments, monetization, social, content and gaming Experience in corporate development and international business expansion Leadership in the strategy and operations of a global technology company
	Ralph Izzo	Member	2020	Male	6,905	$314,334	Yes	Energy, Finance	Senior leadership of a publicly traded company Experience in strategic planning, finance, risk management and operations of large, highly regulated companies Expertise in science, technology and public policy
	Sandie O'Connor	Member	2021	Female	0	$0	Yes	Finance	Senior leadership of a publicly traded, large global financial institution Expertise in risk management, financial regulation and policy development, and strategic planning Expertise in capital markets, balance sheet management and banking
	Elizabeth Robinson	Member	2016	Female	2,924	$133,084	Yes	Finance	Experience in finance and risk management Experience in financial regulation and banking Leadership in the operations of a large global financial institution
	Robin Vince	Member/CEO	2022	Male	112,595	$5,125,324	No	Finance	Knowledge of the company's businesses and operations Experience in banking, risk management and financial regulation Experience in the operations of a large financial institution
	Frederick Terrell	Member	2020	Male	11,714	$533,221	Yes	Banking	Expertise in banking, finance and corporate strategy Leadership in the business of a large global financial institution Experience in advising on corporate strategy and complex transactions
	Alfred Zollar	Member	2019	Male	2,973	$135,331	Yes	Finance, Technology	Experience in private equity and financing, operating and investing in companies Technology and information management expertise Extensive service on the boards of several large public companies
			Total------->		***249,962.75***	***$11,378,305***			

Source: Company data

APPENDIX (4) – Interest Rates

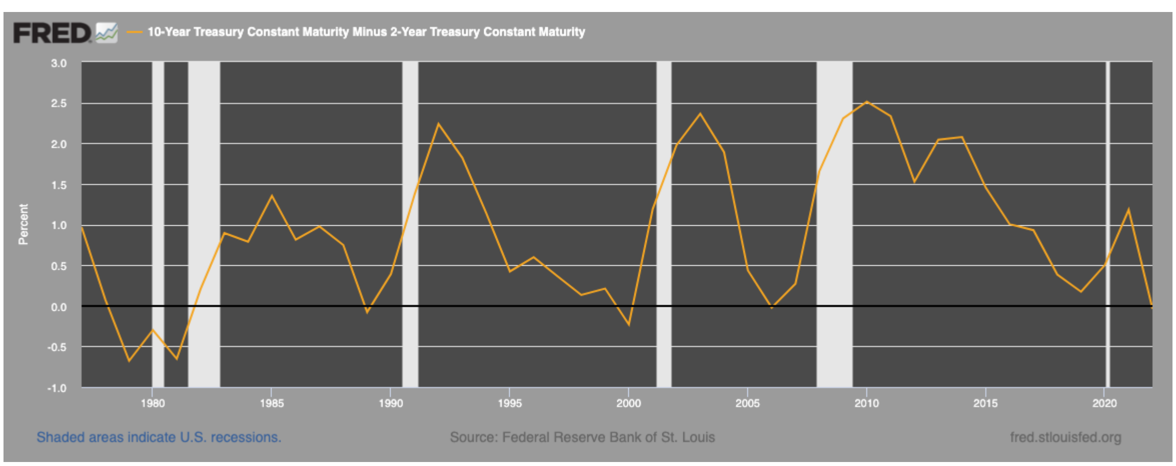
4.1) FED Fund Rates Probability Heat Map

	Meeting Probabilities							
Date	**350-375 bps**	**375-400 bps**	**400-425 bps**	**425-450 bps**	**450-475 bps**	**475-500 bps**	**500-525 bps**	**525-550 bps**
2/1/23	0.00%	0.00%	0.00%	0.00%	98.10%	1.90%	0.00%	0.00%
3/22/23	0.00%	0.00%	0.00%	0.00%	14.10%	84.30%	1.60%	0.00%
5/3/23	0.00%	0.00%	0.00%	0.00%	8.80%	58.00%	32.50%	0.60%
6/14/23	0.00%	0.00%	0.00%	0.00%	8.00%	53.20%	35.00%	3.80%
7/26/23	0.00%	0.00%	0.00%	2.20%	20.30%	48.20%	26.50%	2.70%
9/20/23	0.00%	0.00%	0.80%	8.70%	30.40%	40.40%	18.00%	1.80%
11/1/23	0.00%	0.30%	4.20%	18.00%	34.70%	30.80%	11.00%	1.00%
12/13/23	0.30%	3.40%	15.20%	31.30%	31.60%	14.90%	3.00%	0.20%

Source: Team Analysis

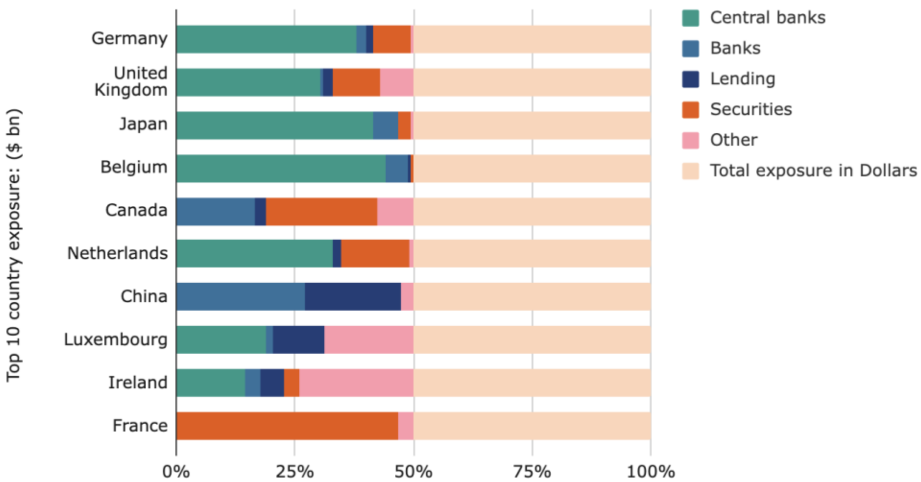
We use the following quarterly forecast of FED rates, based on the *Meeting Probabilities*:

1Q23	2Q23	3Q23	4Q23	FY23	FY24
4.75%	5.00%	4.75%	4.50%	4.50%	4.00%



Source: FRED website

Type of Exposure for each of the top 10 Country Exposures



Source: Company data

APPENDIX (6) – Financial Statements

Financial Statements | **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%*	*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%*
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%*
- Provision for credit losses	-$25	$336	-$231	$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%*
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%*
- 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%*

We estimate the effect of interest rate increases on the Net Interest Revenue, using two regression models:

1. Marginal effect of interest rate increases on YoY Net Interest Revenue

An increase in the fed funds rate in t-1 has two opposite effects in the Net Interest revenue: (i) increase in interest revenue and (ii) increase in interest expense. For this reason, it is important to consider the Net Interest Margin:

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

We assume that the interest margin remains positive, given that it increases under a high interest environment, in line with expectations, as spreads fall under a low interest rates environment. With this assumption, we estimate the following model. The p-value of the marginal effect is <0.05, so we conclude individual significance. 64% of the variance of is explained by the model (as shown by the adj. R-squared) and the F is sufficiently high to conclude global significance.

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

Fed Funds Rate	
Coefficients	0.139
Standard Error	0.179
t Stat	7.7607
P-value	**0.000**
F	60.23

Regression Statistics	
Multiple R	0.81252265
R Square	0.66019305
Adjusted R Square	0.64923154
Standard Error	0.46408195
Observations	33

The marginal effect is 0.1390, which means that 1bps increases in interest rates increase the % growth of net interest revenue by 13.9%. However, there is a portion of the change that is not explained by the model, so we use another estimation to adjust this effect.

2. Probability Model for an increase in net interest revenue

We specify the following variables to estimate the model:

$$f(y)_t = \{1,\ \ if\ the\ revenue\ increased\ with\ respect\ to\ t-1\ (YoY)\ 0,\ \ otherwise$$

$$f(x)_t = \{1,\ \ if\ the\ Fed\ Rate\ increased\ in\ the\ last\ quarter\ 0,\ \ otherwise$$

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

Where α_t captures the increase in probability of an increase in the net interest revenue, given an increase in the Fed Rate in the las t quarter. The following table summarizes the results:

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

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

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

We conclude individual and global significance at **95% confidence**. From the tables on the right side, we see that in almost 33% of the cases the direction of net interest income and interest rates were not equal. The following table summarizes those scenarios:

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%

Error I & II	32%
Success	68%

Notice that the scenarios where there is Error Type I and II are those where the change in the interest rates was very low or did not change (due to the specification, a change of zero is not distinguished from a decrease). We use the 67.5% alpha to probability-weight our effect.

APPENDIX (8) – Forecast of Interest Revenue

Using a combination of the estimators from both models, we conclude that the marginal increase of a Fed funds rate increase is equal to 0.09% YoY per bps. We back-test our models for 2021 and estimate the percentage of change in the revenue that is explained by the model. This percentage is then used to ensure that we only increase the portion of the net interest revenue that is explained by our specification.

Table 1: Back-test for 2022

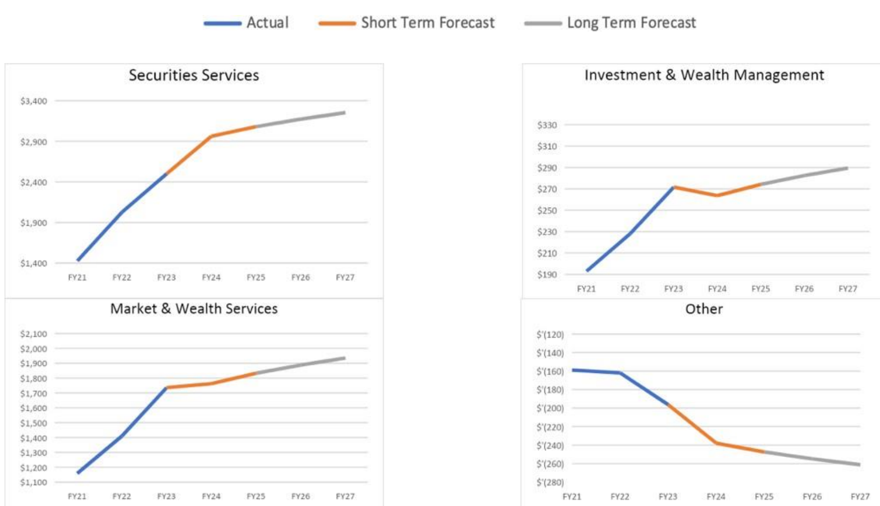
	1Q22	2Q22	3Q22	4Q22
Securities Services	**$377.00**	**$457.00**	**$538.00**	**$656.00**
growth rate YoY	***5.90%***	***29.10%***	***54.20%***	***78.70%***
interest rates effect as % of growth	17.50%	36.80%	43.00%	47.90%
non-interest rates growth as % of growth	82.50%	63.20%	57.00%	52.10%
non-interest rates growth	4.90%	18.40%	30.90%	41.00%
forecasted interest rates total effect	0.20%	3.90%	10.00%	18.10%
Market & Wealth	**$296.00**	**$340.00**	**$378.00**	**$396.00**
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%
Investment & Wealth Management	**$57.00**	**$62.00**	**$57.00**	**$52.00**
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%
Other	**($32.00)**	**($35.00)**	**($47.00)**	**($48.00)**
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%
Fed Funds Rate	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%

The following table shows the forecast for all the segments:

Table 2: Net Interest Revenue Forecast

	FY22	1Q23	2Q23	3Q23	4Q23	FY23	FY24
Securities Services	**$2,028.00**	**$497.05**	**$588.65**	**$658.58**	**$756.09**	**$2,500.36**	**$2,962.69**
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%
Market & Wealth	**$1,410.00**	**$409.04**	**$450.17**	**$454.44**	**$422.13**	**$1,735.77**	**$1,762.20**
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%
Investment & Wealth Management	**$228.00**	**$74.57**	**$77.95**	**$65.54**	**$53.54**	**$271.60**	**$263.65**
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%
Other	**($162.00)**	**($38.78)**	**($42.42)**	**($56.96)**	**($58.17)**	**($196.32)**	**($237.92)**
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%
Fed Funds Rate		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%

Table 3: Interest Revenue Forecast for each business line



APPENDIX (9) – Assets Under Custody and Assets Under Management Estimation

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)

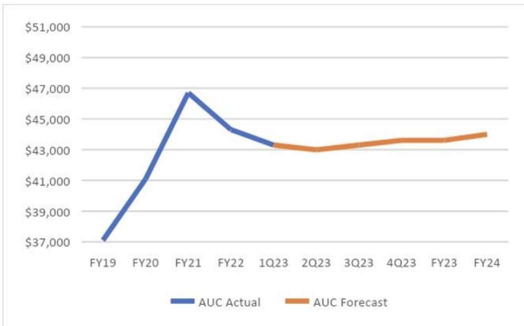
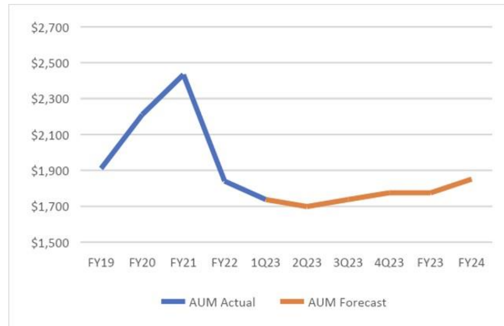


Table 2: Assets Under Management (AUM)



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 (10) – 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
Total Fee & Other Revenue	**$13,274**	**$12,831**	**$13,313**	**$12,873**	**$12,476**	**$ 12,702**	**$12,892**	**$13,130**	**$13,421**
growth YoY		*-3%*	*4%*	*-3%*	*-3.08%*	*1.81%*	*1.49%*	*1.85%*	*2.21%*