Mountain Plains Housing Summit
2024 • Colorado Springs, CO

Welcome

Rating Agencies

Rating Agencies

Teresa Galicia
Director, U.S. Public Finance Community Development & Social Lending, Fitch Ratings

Ferdinand S. Perrault
Vice President, Senior Credit Officer Housing Finance & State Revolving Funds, Public Finance, Moody's Ratings

Dan Pulter, CFA
Associate Director, Americas Public Finance, S&P Global Ratings

Moderator: Thomas Bryan
Chief Financial Officer, CHFA

Sector Outlook

1. Please share your view of the current market and it’s impact on the housing sector.
2. Can you share any positive trends you are seeing in the housing sector?
3. Similarly, can you share any headwinds you are seeing in the sector? What factors could change the sector outlook from stable?

Rating Analysis

With interest rates remaining high, and prepayment speeds very low, are you assessing an HFA’s ability to maintain proper amounts of liquidity? If so, what metrics are you looking at to determine this?

How do you view second mortgages? Can you explain your methodology for applying haircuts on second mortgages and treatment of seconds when calculating cashflows? What type of past payment history can HFA’s provide to receive more credit on its second mortgages? Does the structure of the 2nd (amortizing, deferred, forgivable, etc.) affect any potential credit in the haircut calculations?

Rating Analysis (continued)

Rating agencies reference an indenture's parity ratio (102, 103%, etc) in press releases and other info, but rarely do they mention total $ amount of an indenture's net equity. With so many HFA's ramping up production in their indentures, with new issuance having a dilutive effect on parity ratios, do you also look at total $ amount of parity, or only parity ratios?

Do you have a view on the appropriate amount or use of variable rate debt in an indenture? What is too much? If you can't speak to a specific amount, are you able to talk around the management of variable rate debt, etc?

Rating Analysis (continued)

Some HFAs are working with nonprofit/philanthropic organizations to provide loan guarantees as a form of credit enhancement. How would your agency look at such guarantees to cover construction periods?

What non-financial factors are you looking at when conducting your review of an HFA?

Rating Agency Panel

Dan Pulter, CFA
Associate Director
Americas Public Finance
Affordable Housing

May 8, 2024

2024 Mountain Plains Housing Summit

S&P Global
Ratings

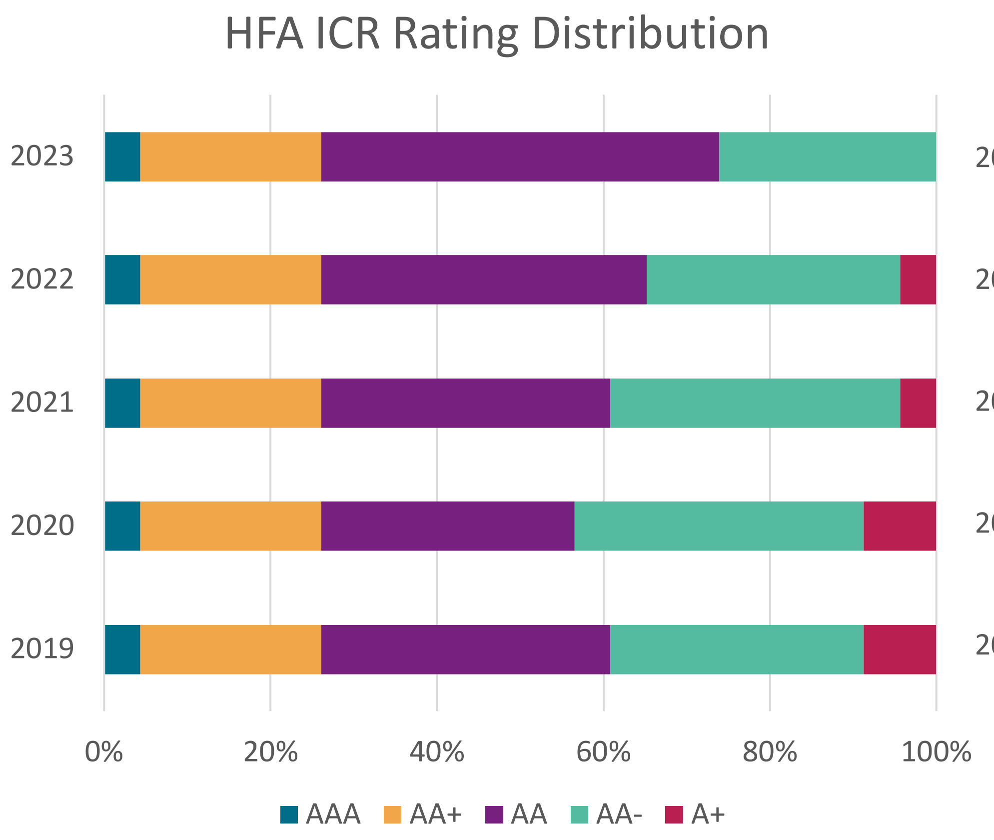
Question 1

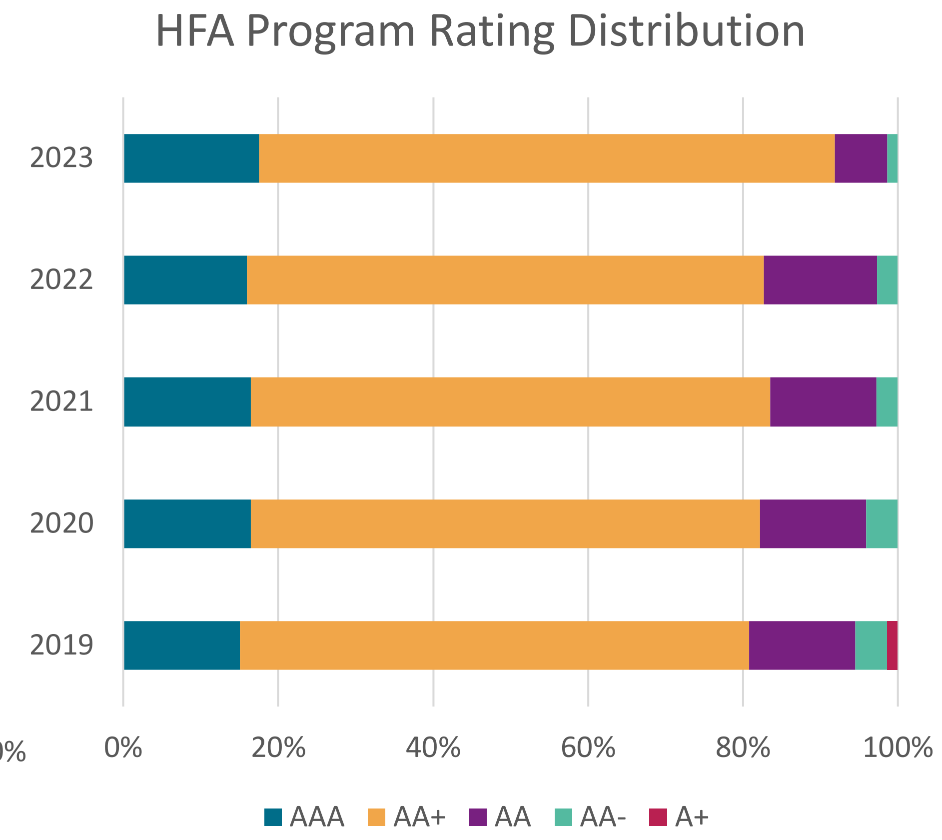
Can you share any positive trends you are seeing in the housing sector?

Subsector Highlights | Housing Finance Agencies

HFA issuer credit ratings and mortgage revenue bond program ratings are **all stable**

- Median ICR rating: **AA**
- Median MRB program rating: **AA+**



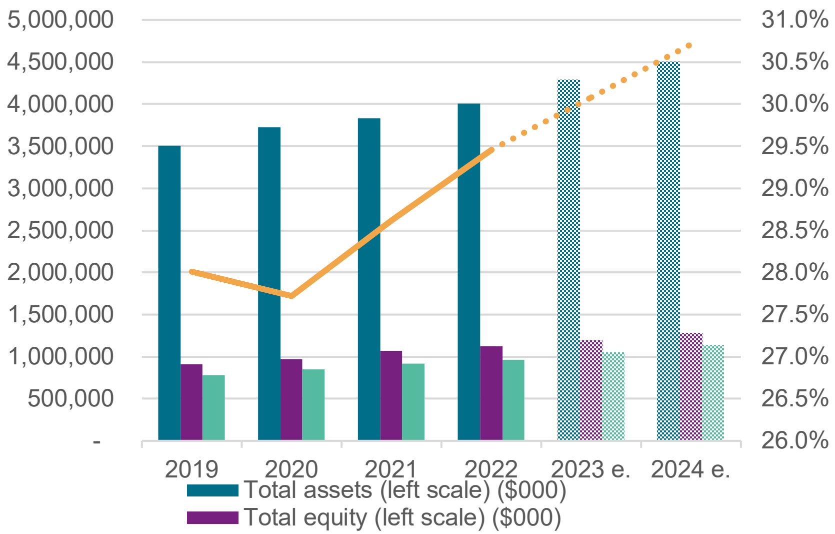


S&P Global Ratings

Subsector Highlights | HFAs

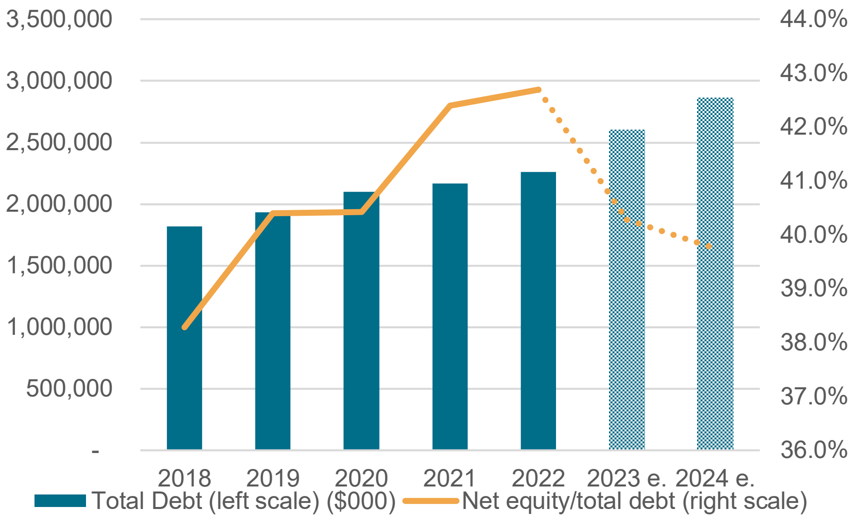
Strengthened balance sheets and increased leverage expected in 2024

HFA equity and assets expected to continue growing in 2024, but potentially at a slower rate than in 2022 and 2023



e. – Estimated
Source: S&P Global Ratings

Continued growth in debt expected, leading to a decline in net equity-to-debt ratios



e. – Estimated
Source: S&P Global Ratings

Question 2

Similarly, can you share any headwinds you are seeing in the sector? What factors could change the sector outlook from stable?

Sector Trends | What We're Watching

Macroeconomic conditions
Higher interest rates could result in additional debt issuance to meet demand for first-time homebuyers and boost down-payment assistance programs.

Insurance costs and availability
Insurer decisions to maintain profitability could create cash flow uncertainty, pressure debt service coverage for multifamily properties, and potentially increase loss exposure for homeowners.

Elections
National and state elections could stall prospects of new housing legislation or funding in 2024, with future support for federal appropriations uncertain.

Access and affordability
Limited housing inventory and elevated median home prices will likely lead to a substantial increase in loan production that could bolster balance sheets and keep vacancy rates low, but marginally erode asset-to-liability parity ratios for some programs.

Demographics
Millennials remain the largest cohort of first-time homebuyers, but economic pressures will likely persist in 2024 and limit their homebuying ability.

Event risks
Cyber risks, energy efficiency requirements and higher utility costs, and more frequent and severe weather events could absorb more financial resources against a backdrop of limited revenue-raising and cost-cutting flexibility.

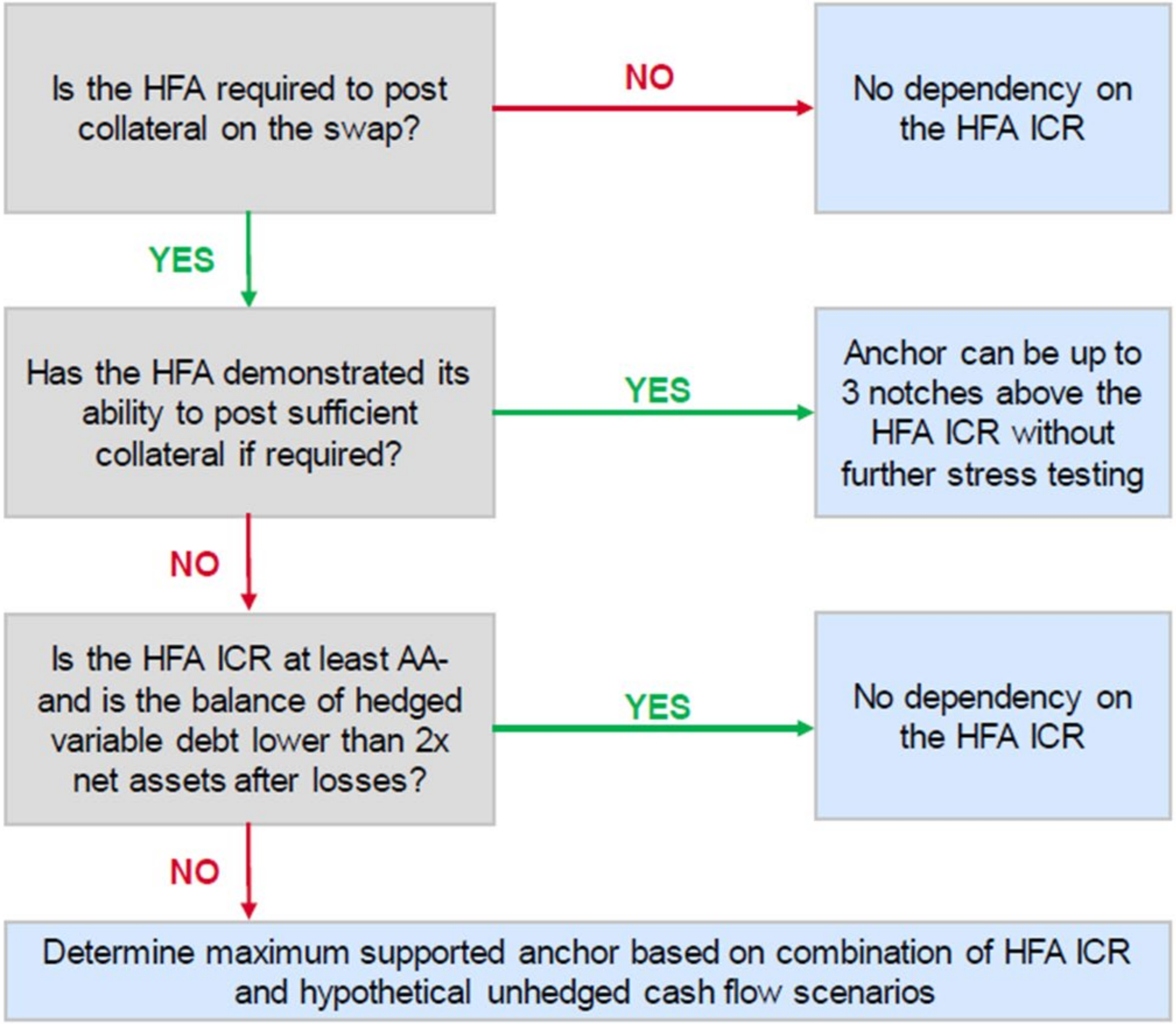
Source: S&P Global Ratings.

Question 6

Do you have a view on the appropriate amount or use of variable rate debt in an indenture? Or what is too much? If you can't speak to a specific amount, are you able to talk around the management of variable rate debt, etc?

Programs with hedged variable-rate debt

Determining the link to the HFA ICR

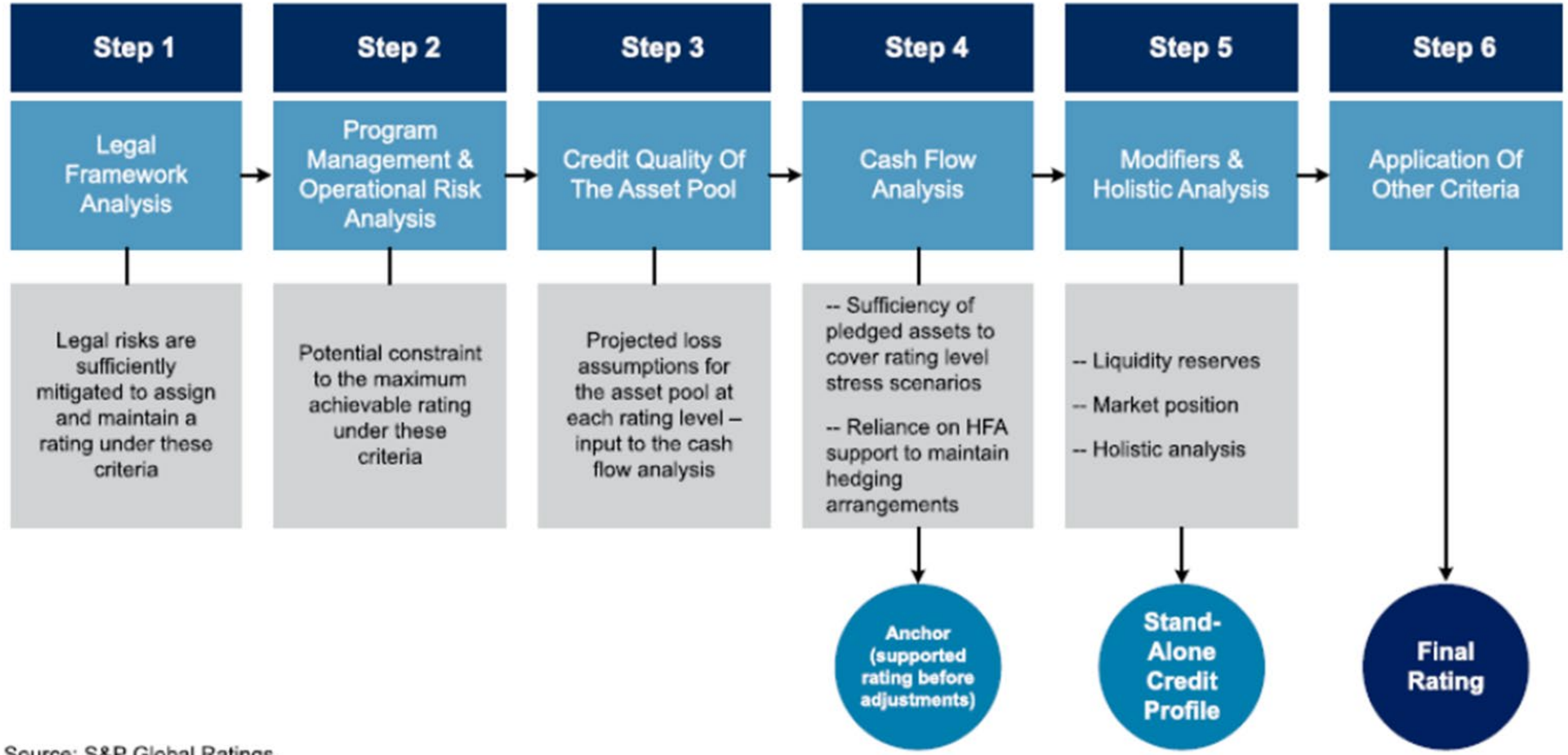


Question 8

- What non-financial factors are you looking at when conducting your review of an HFA?

Mortgage Revenue Bond Program (MRBP) Methodology

- The analytical framework consists of **six steps**:



Source: S&P Global Ratings.

Step 2: Program Management & Operational Risk Analysis (continued)

Program Management & Operational Risk Factors
See Table 2 in Criteria for Examples

1. Program strategy & governance
2. Loan origination & monitoring
3. Asset & liability management
4. Liquidity risk management
5. Counterparty risk management

Table 1
Determining An MRB Program's Maximum Potential Rating Based On Program Management And Operational Risks

Number of factors assessed as negative	Maximum potential rating
0	No constraint
1-2	'aa' category
3-4	'a' category
5	'bbb' category

The presence of a specific attribute may not lead to a negative assessment if we view the identified risk as otherwise mitigated

Table 2 | Download Table

Assessing Program Management And Operational Risks	
Factor	**Examples of negative attributes**
Program strategy & governance	
	Poorly defined strategy
	Weak transparency/disclosure
	Insufficient planning or internal controls; history of failing to set and achieve operational goals
	Less sophisticated management team relative to that of peers, or frequent management turnover
Loan origination & monitoring	
	Origination standards are less robust relative to those of peers, as evidenced through new, riskier loan products or the targeting of riskier borrower profiles
	Less robust monitoring process for servicers and lenders relative to that of peers
	Weak track record of managing delinquencies/recoveries versus peers
Asset & liability management	
	Volatility or expected decline in parity ratio
	Significant mismatch in asset/liability maturities (e.g. from bullet maturity bonds)
	Significant presence of interest rate risk beyond what is captured in the program's cash flows
Liquidity risk management	
	Reserve investment guidelines on credit quality/liquidity/maturity permitted are insufficient to support the program's liquidity needs
	Derivative contracts introduce liquidity risks to the program (e.g. collateral posting or termination payments)
Counterparty risk management	
	Large exposures to individual, or any exposure to speculative grade, counterparties
	Counterparties with no (or non-market standard) collateral arrangements
	HFA termination rights are limited, particularly relative to speculative-grade counterparties
	Lack of planning for expiring counterparty arrangements

Table 8

Market Position Risk Assessment

Risk categories	Examples of factors that generally indicate the presence of risks
Socioeconomic conditions	-- Weak forecast population trends
	-- Forecast significant increases in unemployment rate
Housing market conditions	-- Forecast negative trends not captured in the loss coverage analysis.
	-- Material changes to our market outlook assessment under U.S. residential mortgage-backed securities criteria
Other considerations	-- Unmitigated (e.g., in the form of insufficient insurance), material geographic risks arising from potential environmental events that threaten properties' physical condition
	-- Local, state, or federal policy changes are likely to negatively affect the performance of housing loans or the entity's lending ability

spglobal.com/ratings

S&P Global
Ratings

FitchRatings

HFA Outlook and Trends

Teresa Galicia
Director, U.S. Public Finance
Community Development & Social Lending

2024 Mountain Plains Housing Summit
May 8, 2024

Introduction to Fitch's Community Development & Social Lending (CDSL) Group

- CDSL was renamed from the U.S. Public Finance Tax-Exempt Housing in April 2021 to reflect the broader scope of credits covered by the group.

- The name change also reflects the rapid evolution in the sector over the past five years:

  - ✓ HFAs continue to issue tax-exempt bonds to finance affordable housing.

  - ✓ However, the industry is also issuing more taxable, social impact, and sustainability bonds to foster social-mission lending.

- Karen Fitzgerald, with over 20 years of housing experience, is the CDSL Sector Lead. The CDSL team combined has 60+ years of housing experience, with in-depth knowledge of HFA credits.

- The CDSL team provides forward-looking ratings and ESG relevance scores for all rated credits, including social impact bonds and community investment financings.

Strong Credit Profiles Support CDSL Sector as it Faces Ongoing Uncertainty

Fitch's Sector Outlook: Neutral

- U.S. economy has averted recession but is expected to slow due to higher interest rates and bank credit tightening.
- CDSL sector is well-positioned due to the asset quality of loan portfolios, including federal guarantees, strong financial profiles, conservative risk management, and effective oversight.
- CDSL loan portfolios, despite higher perceived risk, have shown low delinquency, default, and loss rates thanks to prudent risk management.
- Fitch expects manageable loan losses for CDSL issuers even with potential macroeconomic and housing market deterioration.

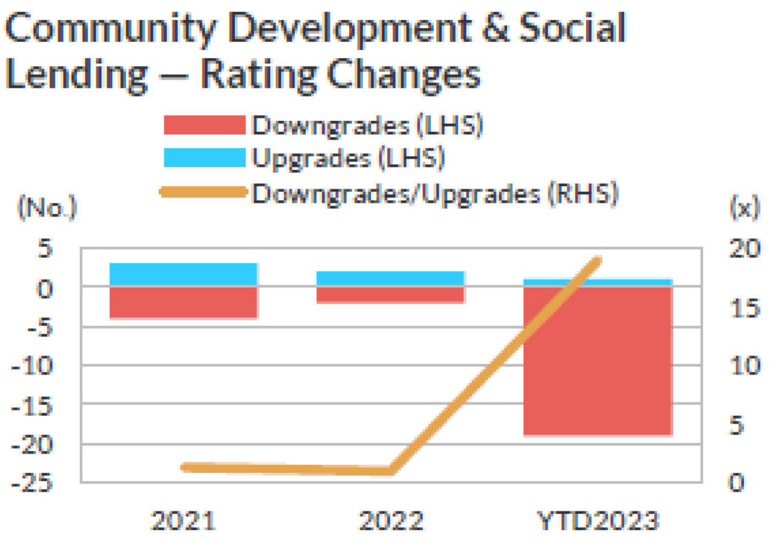
What Could Change Fitch's Sector Outlook to Negative?

- Deteriorating U.S. macroeconomic conditions, leading to rising unemployment, increased inflationary pressures, and/or worsening housing affordability.
- Ongoing heightened financial market volatility, limiting market access.
- Reduction in external support for the sector, evidenced by decreased federal funding and/or declining support from banks and other private sector organizations.

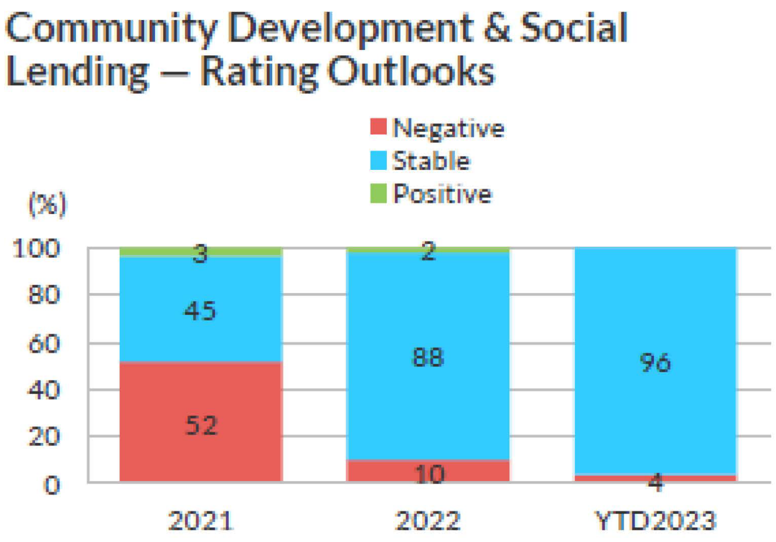
Year in Review: 2023

Rating Actions & Outlooks

- In 2023, there were 19 downgrades and one upgrade among CDSL's sector ratings.
- 16 of 19 downgrades were due to linkage between HFA loan programs and U.S. IDR, downgraded by Fitch on August 1st.
- Affected credits are primarily secured by mortgage-backed securities (MBS) issued by Ginnie Mae, Fannie Mae, and Freddie Mac.
- 3 downgrades were related to two military housing projects with deteriorating operating performance.
- The lone upgrade pertained to one HFA IDR (Illinois Housing Development Authority, to 'AA' from 'AA-').
- About 96% of CDSL ratings have a Stable Rating Outlook, while 4% have Negative Rating Outlooks.



Source: Fitch Ratings



Source: Fitch Ratings

Macroeconomic Conditions Impacting the Housing Market

Fitch Ratings

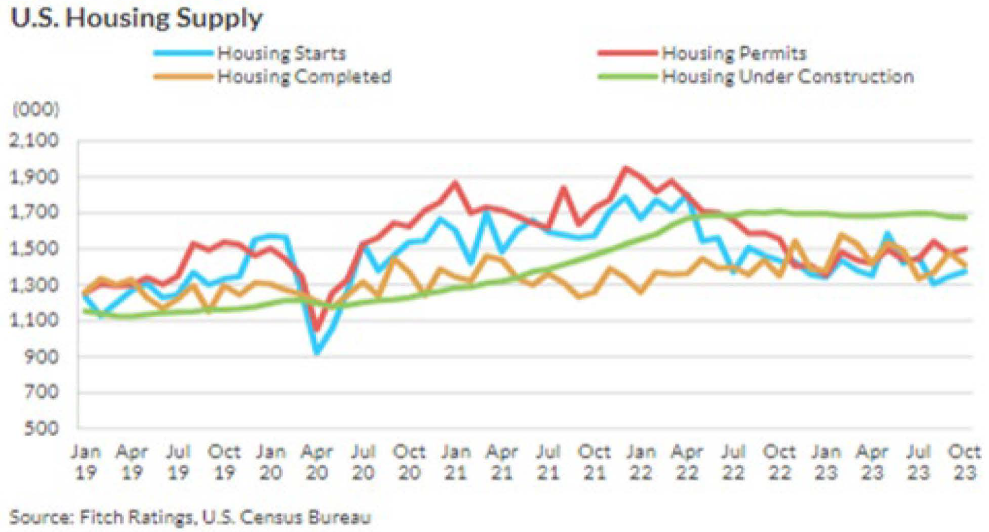
Macroeconomic Conditions & the Housing Market

U.S. Macroeconomic Environment Remains Pressured

- Despite aggressive monetary policy, consumer and labor markets have remained strong, with robust hiring, consumer spending and ongoing GDP growth.
- Inflation is declining slowly, with headline inflation easing due to lower energy prices and reduced food price inflation, yet core inflation in services and wages persists.
- A severe macroeconomic downturn could lead to increased delinquencies and defaults, particularly for issuers lacking adequate liquidity, reserves, or third-party credit enhancement.

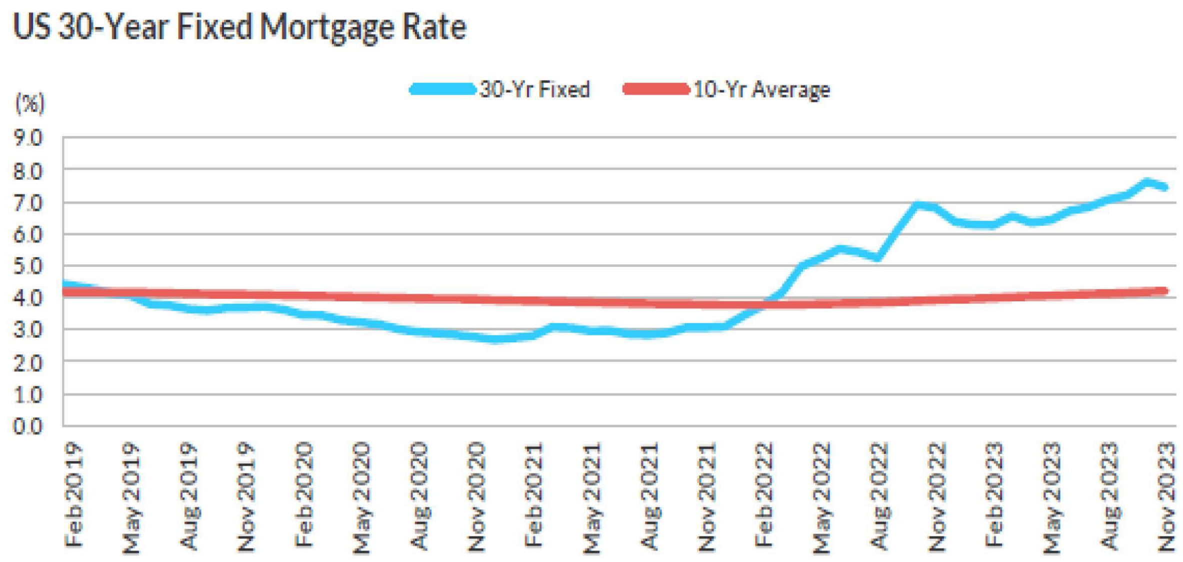
Housing Demand & Supply Imbalance

- Housing construction has not kept up with household growth, leading to a shortage of housing, particularly affordable units, due to rising costs and regulatory barriers.
- New housing starts have remained flat since June 2022, and despite high levels of construction, the inventory of available homes is still 51% below pre-pandemic levels.
- The new housing being built tends to be high-end, exacerbating the affordable housing shortage.
    - ➢ Leaves middle-income earners in major metro areas with limited affordable housing options, often forcing them to spend more time commuting or to move to less expensive areas.
- Housing inventory still remains significantly low, with homeowners reluctant to sell, exacerbating the inventory shortage.



Housing Prices Historically High

- U.S. housing market faces a crisis with a shortage of supply and low demand for new mortgages, resulting in historically high home prices and existing home sales falling to their lowest since the Great Recession.
- Sales of existing homes declined 6% over the course of 2023, attributed to unaffordability due to high interest rates and constrained supply keeping prices high.
- Mortgage rates have soared to their highest in 15 years, with the 30-year fixed rate hitting 7.8%, while home prices continue to rise, with Fitch estimating national home prices to be 11.1% overvalued as of 3Q23.



Source: Federal Reserve Bank of St. Louis

Source: Fitch Ratings

Widening Affordability Gap

- The homeownership rate has risen, but high mortgage rates and elevated home prices have notably hindered first-time buyers from purchasing homes due to financial barriers like the inability to afford down payments.
- A shortage of affordable rental housing persists, with new multifamily developments catering to higher-income renters, and the availability of low-cost units dwindling over the years.
- Rent prices have surged by over 25% since 2020, and despite a recent drop in rental demand, longer-term trends suggest an increase in demand as younger households enter the rental market.
  - ➢ But persistent barriers to homeownership are keeping many from exiting the rental market.
- This recent confluence of events has produced the most significant decline in housing affordability in years.

The Widening Affordability Gap

- The monthly mortgage payment on a median-priced home grew by 29%, to $2,300 from $1,780, in March 2023 compared to one year earlier, while the minimum income needed to afford a median-priced home grew by 20% to $117,100 from $97,400 in the same period.
- The ratio of home prices to median household incomes reached an all-time high of nearly 7.5x in July 2023.
- Approximately 36% of recently built multifamily units had asking rents of $2,050 or more, while only 5% had rents below $1,050.
- The number of households paying more than 30% of their incomes for housing rose to 40.6 million (32% of all households) between 2019 and 2021, with 20.3 million (16% of all households) paying more than 50% of their incomes for housing.

Sources: Joint Center for Housing Studies (JCHS) at Harvard University, "The State of the Nation's Housing 2023"; Federal Reserve Bank of St. Louis.

Filling the Funding Gaps

The Sunsetting of Pandemic-Era Housing Assistance

- U.S. pandemic housing aid included $46B for emergency rental assistance, $10B for the Homeowner Assistance Fund, and eviction moratoriums.
- Federal aid depletion plus rising mortgage rates and home prices brings new risks.
- State and local governments have turned to $14.2 billion in fiscal recovery funds to continue providing housing support.

Tapping the Bond Markets

- HFAs are offering critical support to borrowers facing affordability challenges by offering loans that cater to those not meeting the tightening credit conditions of conventional lenders.
- In the current high interest rate environment, HFAs benefit from increased profitability and more competitive mortgage rates, leading to growth in their balance sheets and the ability to offer subsidized mortgages.
- HFAs have adapted by issuing more tax-exempt mortgage revenue bonds and increasing taxable bond issuance, resulting in an strong uptick in bond issuance in 2023.
  - ➢ HFAs are also enhancing their loan products by providing larger down payment assistance, affordable homeowners insurance options and other benefits not otherwise available from conventional lenders.
  - ➢ HFA bond issuance is expected to remain strong in 2024, but may be limited by private activity bond (PAB) volume cap.

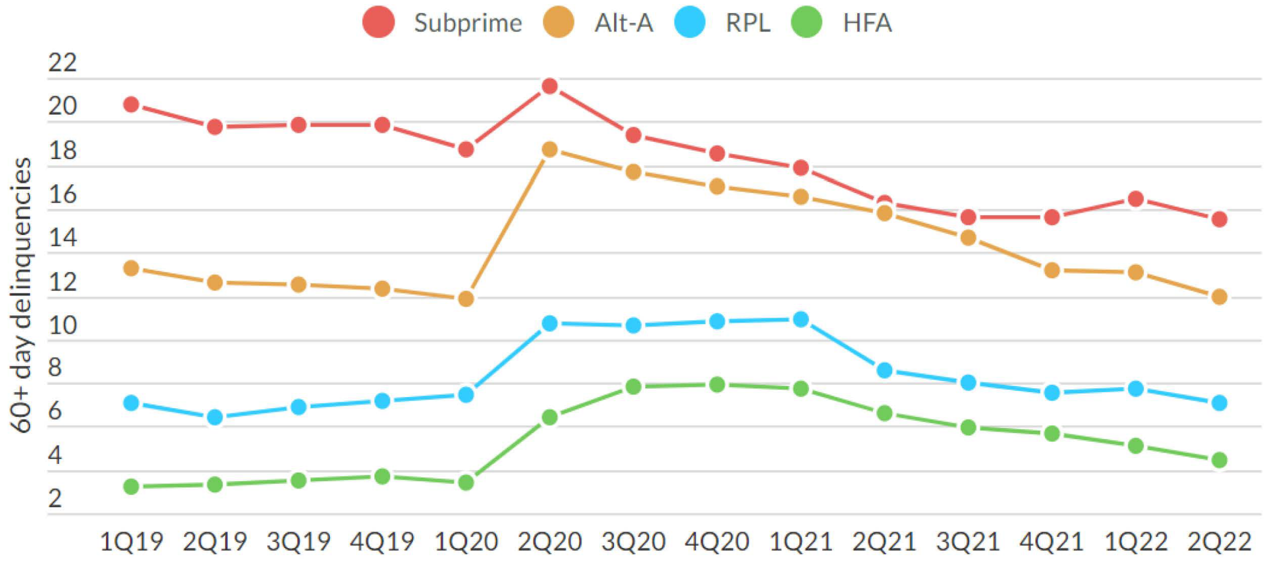
State HFAs: Financial Analysis and Trends

Fitch Ratings

State Housing Finance Agencies

- Fitch considers state HFAs to be in a strong position to withstand potential economic and housing market downturns due to robust financial profiles, conservative risk management, effective oversight, and a history of successful loss mitigation.
- State HFA loan portfolios also benefit from federal government guarantees, insurance, and other forms of support such as excess overcollateralization, which insulate them to a large degree from the worst effects of economic downturns.
- Despite the perceived higher risk and lower credit quality of their loan portfolios and borrowers relative to prime borrowers, HFA loan portfolios have experienced generally low delinquency and loss rates.
  - ➢ In fact, Fitch found that HFA loan performance during the pandemic compared favorably to Alt-A, subprime and reperforming loans with similar attributes to HFA loans. Fitch attributes this to proactive borrower engagement and education, as well as ongoing oversight.

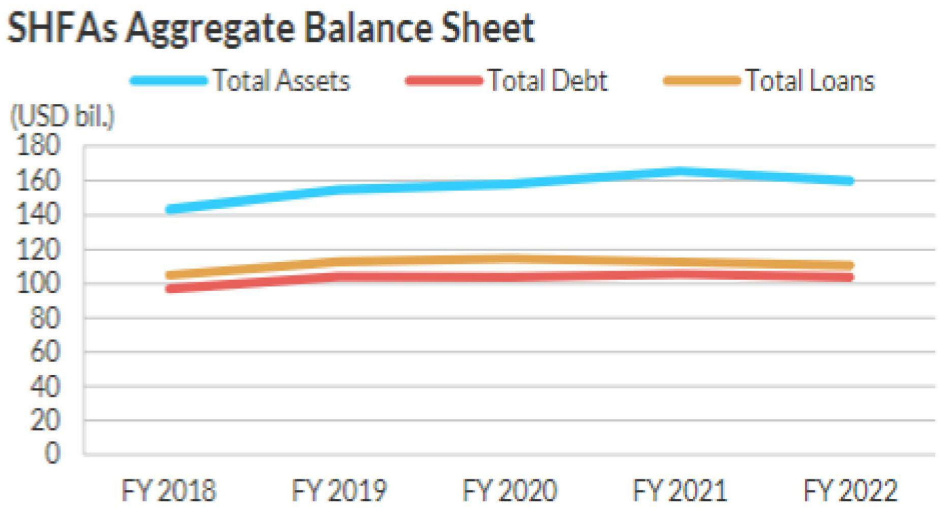
HFA Loans Exhibit Stronger Performance than Loans with Similar Characteristics



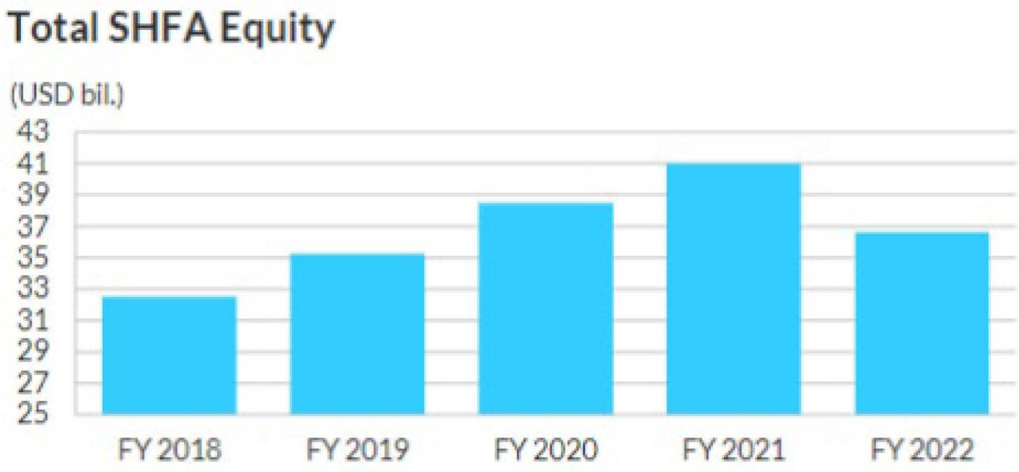
Source: Fitch Ratings

Introduction to Fitch's HFA Peer Review Report

- Annual report with 5 years of financial data for 51 HFAs; excludes non-housing funds and conduit debt.
- Fitch's HFA Peer Review, published in October 2023, demonstrated that, for the first time since 2015, state HFAs experienced a decline in total assets and debt in fiscal 2022, due to bond market turbulence and suppressed debt issuance.
- We expect this trend to reverse given the strong issuance of 2023 and YTD (SF issuance up 50% in 2023).
- With decrease in overall balance sheets, HFAs also saw a 10.5% decline in equity in FY 2022, reversing the steady growth trend of a 31% increase in equity from FY 2017 – FY 2021.



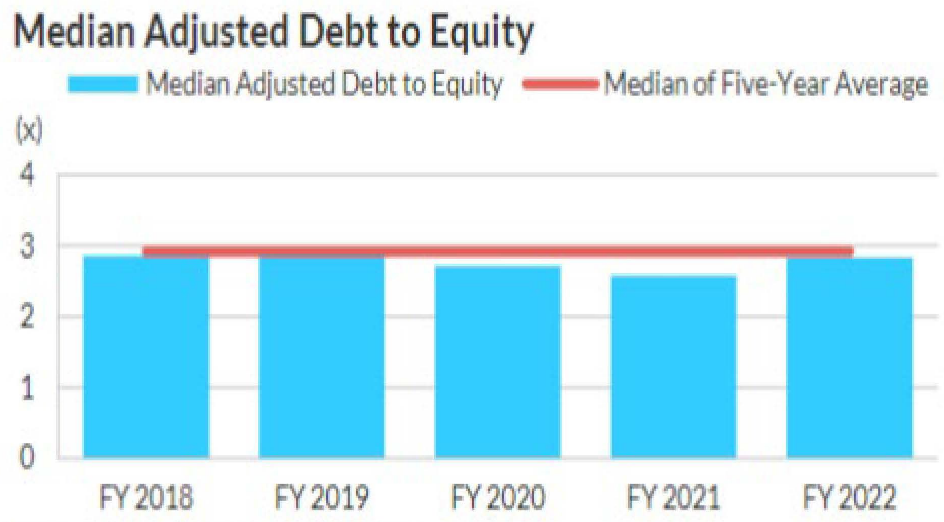
Source: Fitch Ratings, Fitch Solutions



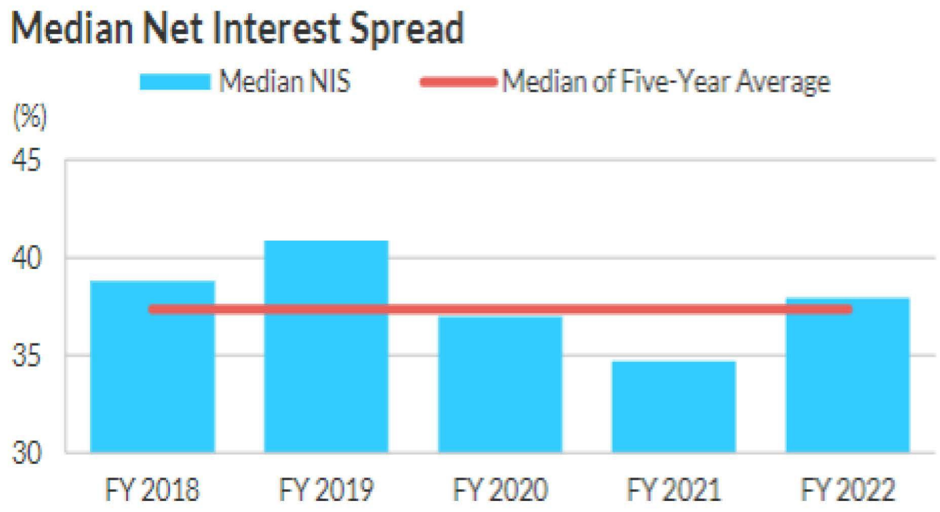
Note: Numbers represent Fitch-adjusted equity.
Source: Fitch Ratings, Fitch Solutions

HFA Peer Review Report (continued)

- Despite equity declines, decreased debt issuance allowed HFAs to maintain stable leverage ratios.
- Additionally, median NIS returned to a positive trend in FY 2022 after two years of declines.
- The shift to keeping loans on balance sheet vs. selling in the TBA market provides a long-term revenue stream and should have a positive impact on profitability over time.



Source: Fitch Ratings, Fitch Solutions



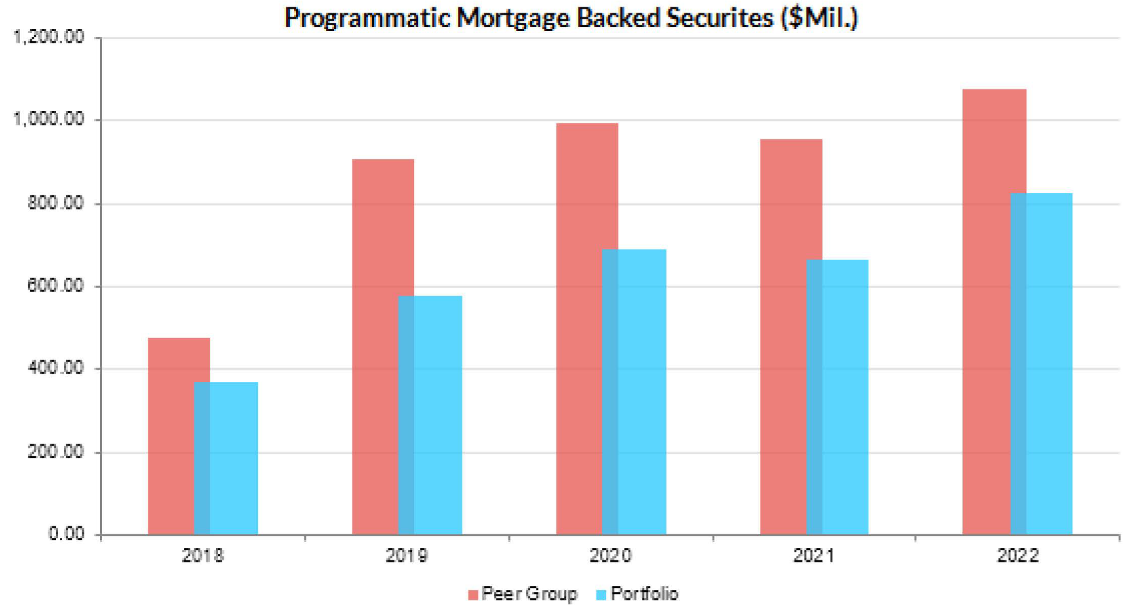
Source: Fitch Ratings, Fitch Solutions

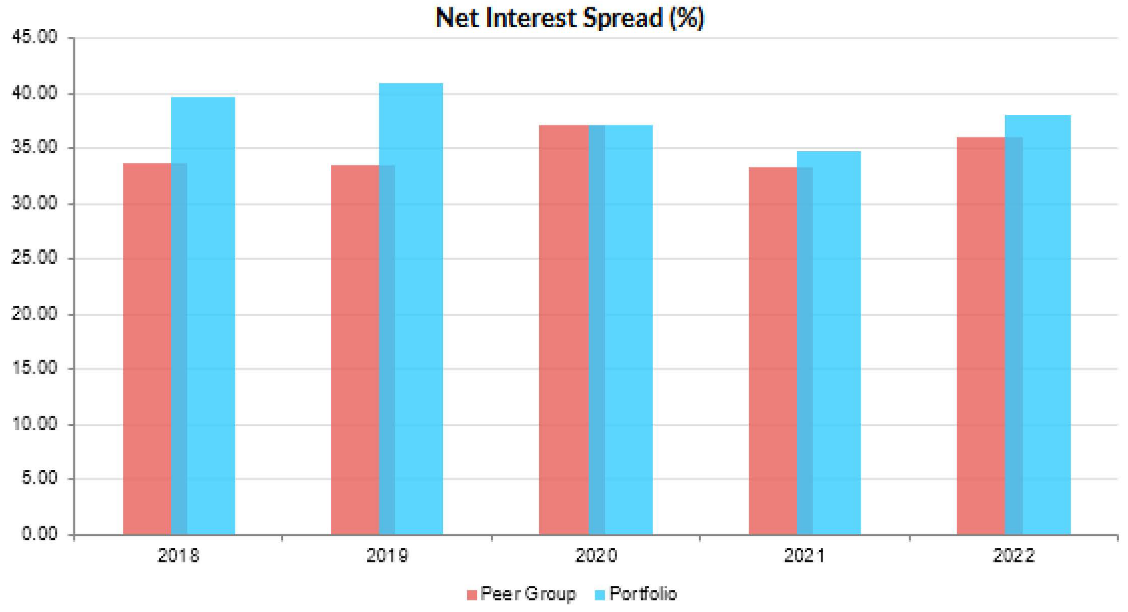
Fitch's HFA Peer Group Selector Tool

FitchRatings

Peer Group Selector Tool – Mountain Plains HFAs

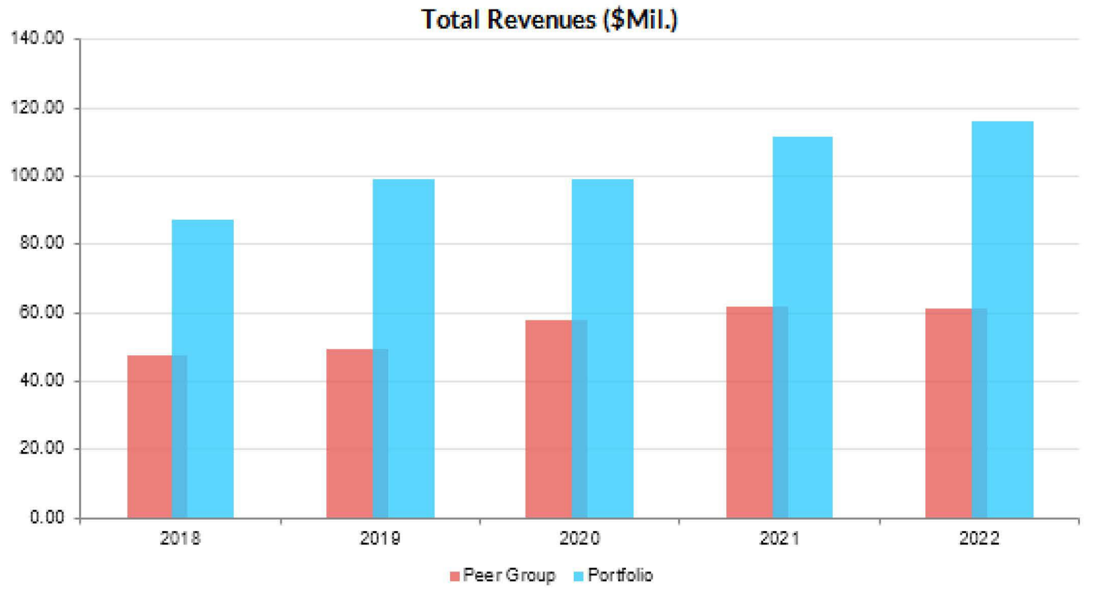
- Fitch's HFA Peer Review FACT tool allows for a Peer Group Analysis.
- Below charts compare the nine Mountain Plains Housing Summit HFA core members (the Peer Group) with all 51 HFAs.
- Balance sheets of the Mountain Plains HFAs show stronger asset quality with higher levels of programmatic MBS.
- Despite the tighter spreads from MBS portfolios, the Mountain Plains HFAs' profitability as measured by Net Interest Spread is not significantly lower than the portfolio medians.

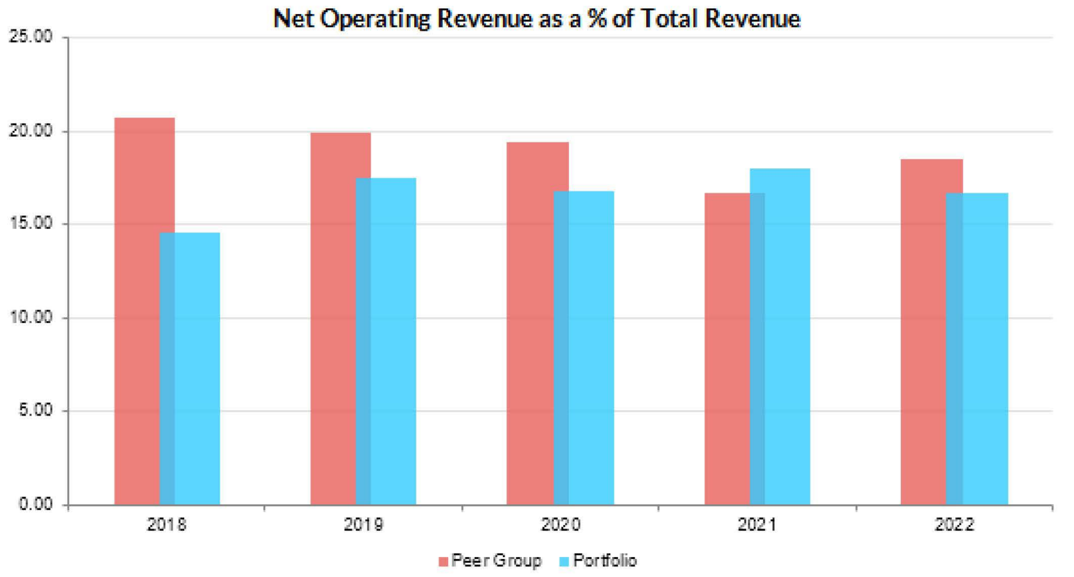




Mountain Plains HFA Peer Group

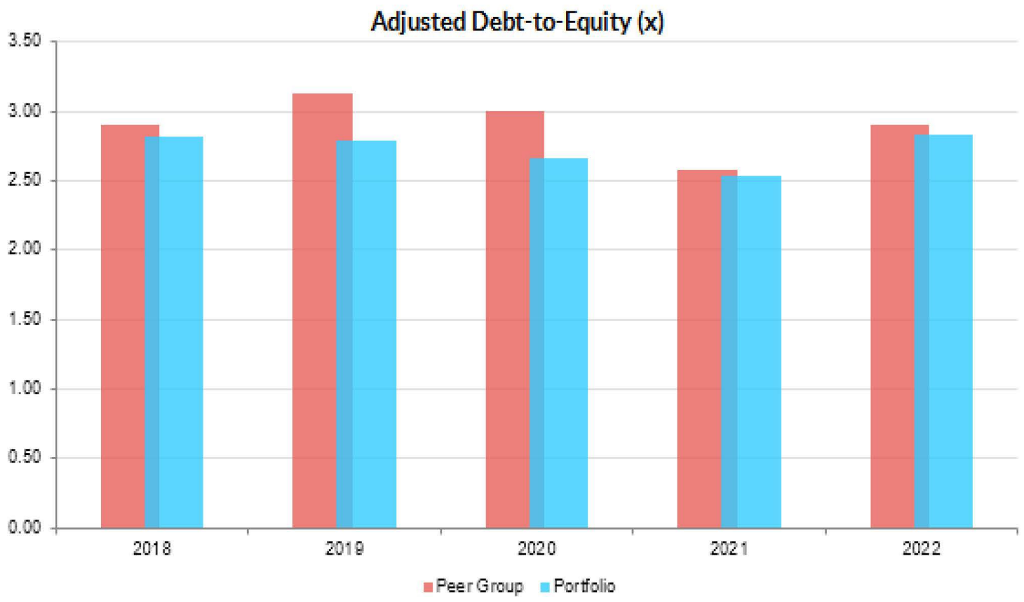
- Median Total Revenues ($ Mil.) are lower for the Mountain Plains HFA Peer Group compared with all HFAs.
- However, Net Operating Revenue as a % of Total Revenues is stronger for the Mountain Plains HFA Peer Group than all HFA portfolio medians.

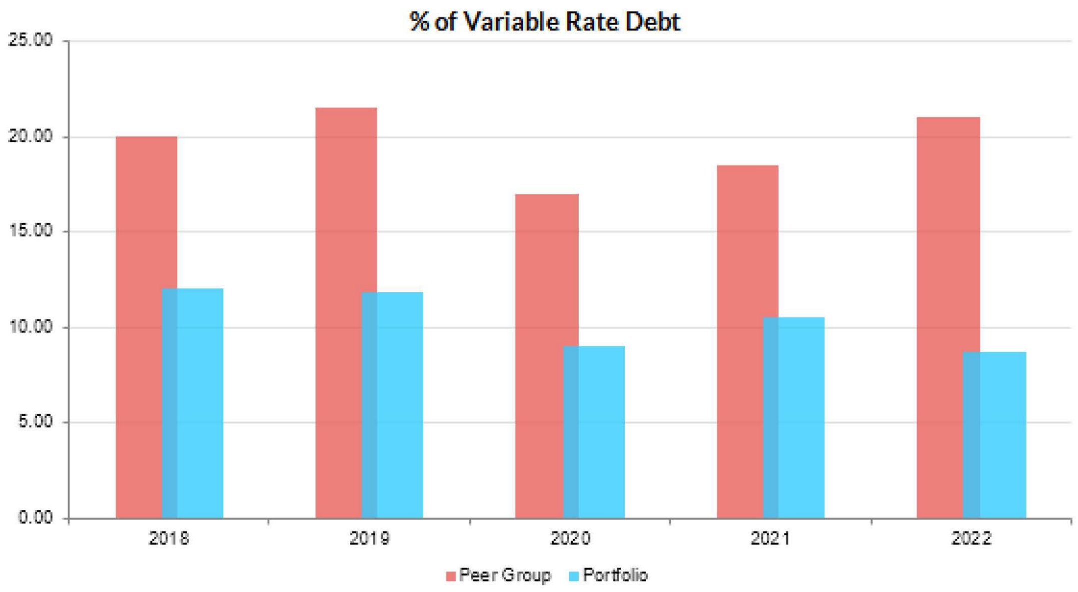




Mountain Plains HFA Peer Group

- Median Debt-to-equity ratio for the Mountain Plains HFA Peer Group is in line with DTE for all 51 HFAs.
- Of the total debt, Mountain Plains HFAs demonstrate higher percentage of variable-rate debt than the portfolio medians.



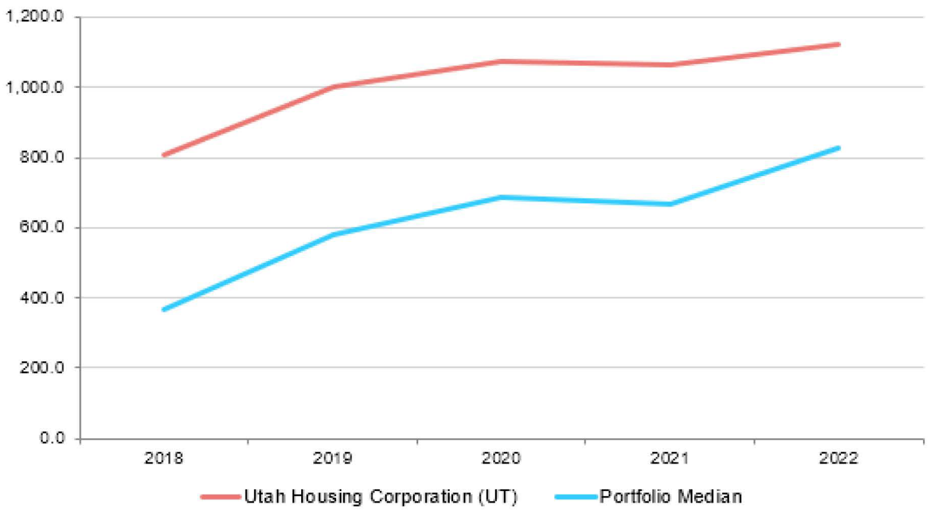


Utah Housing Corporation (case study)

- The Peer Review FACT Tool also allows comparison of individual HFA to Portfolio Medians.
- In March 2022, Fitch upgraded Utah Housing Corporation's IDR to 'AA', Stable Outlook from 'AA-', Positive Outlook. The charts below show UHC's improvement in asset quality over a five-year time period compared with the Portfolio Median.

Programmatic Mortgage Backed Securites ($Mil.)	2018	2019	2020	2021	2022
Utah Housing Corporation (UT)	809.3	1,003.6	1,073.0	1,063.3	1,124.4
Portfolio Median	369.1	578.4	687.3	666.0	826.3

Measures the percentage of the mortgage loans that are programmatic securing debt..



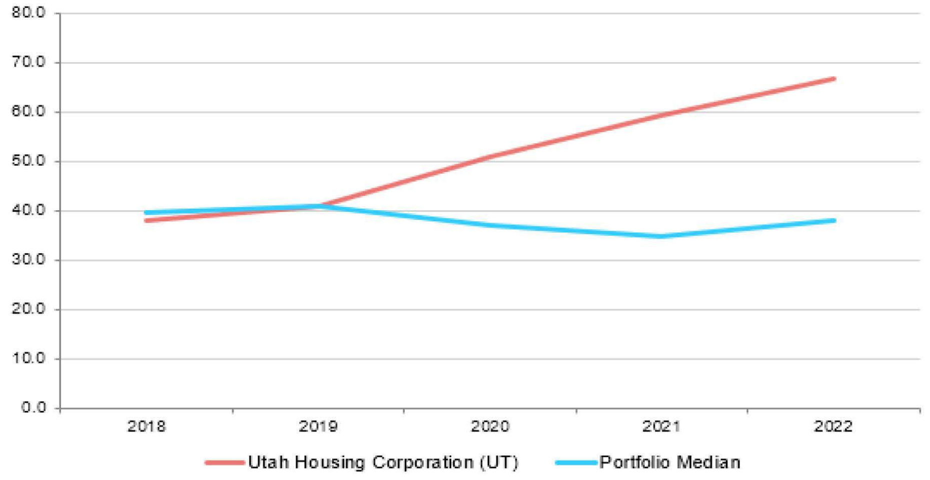
Source: Fitch Ratings.

Utah Housing Corporation (continued)

- During the same five-year time period, profitability and leverage ratios also trended positive, and by FY 2022, were in line with or outpaced the Portfolio Median.

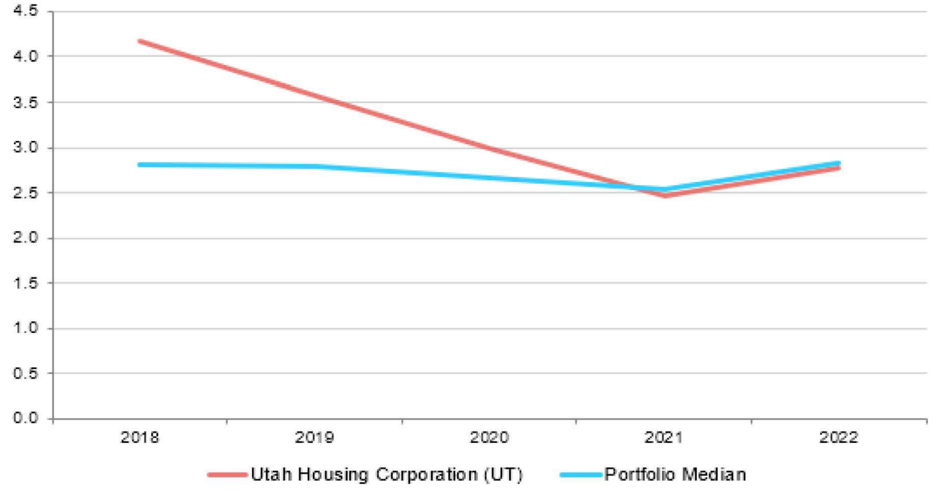
Net Interest Spread (%)	2018	2019	2020	2021	2022
Utah Housing Corporation (UT)	38.0	40.9	50.9	59.4	66.9
Portfolio Median	39.6	40.9	37.1	34.7	37.9

Measures an SHFAs average earning assets.



Adjusted Debt-to-Equity (x)	2018	2019	2020	2021	2022
Utah Housing Corporation (UT)	4.2	3.6	3.0	2.5	2.8
Portfolio Median	2.8	2.8	2.7	2.5	2.8

Used to measure a company's financial leverage.



Source: Fitch Ratings.

Fitch Ratings and Contacts

FitchRatings

Fitch's Rating 'Products'

	Indicative Rating	Public Rating	Private Rating	Rating Assessment Service (RAS)	Credit Opinion
Description	• Confidential, point-in-time rating • Issuer decides whether to: ✓ Publish rating ✓ Continue monitored Private rating ✓ Stop rating process	• General purposes • Financing purposes	• Non-public financing transactions	• Assessment of given scenarios • Transaction specific • Not limited to Fitch-rated entities • Can consider multiple financing scenarios	• Opinion which omits one or more characteristics of a full rating
Reference	• Point-in-time	• Monitored	• Monitored	• Point-in-time	• Typically point-in-time
Notch Specific	• Yes	• Yes	• Yes	• Yes	• Notch or category specific
Output	• Confidential rating letter can be provided	• Rating Commentary • Full report	• Confidential rating letter	• Confidential rating letter	• Confidential rating letter

Turnaround Time

- Fitch strives to provide indicative ratings within 4 – 6 weeks for greenfield projects; Fitch may be able to commit to a 3-4 week turnaround time for relatively simple brownfield transactions depending on capacity and other factors.

Why Use a Fitch Rating?

Attribute	Commentary
Strong, In-Depth Review Process	• Guided by forward-looking and transparent criteria for CDFIs • Separate criteria for CDFIs that recognizes similarities and differences among CDFIs, housing finance agencies (HFAs), and other lending institutions • New explicit through-the-cycle analytical tools (FAST) • Timely & objective credit reviews ensures accuracy of credit ratings • Managed by experienced, informed analysts
Investors Value Fitch's Opinions	• Rating reports regarded as the best in the industry • New Issue reports broadly accessed by municipal market participants • 1:1 meetings with institutional investors • Prompt access to analytical staff for timely inquiries • Analyst accessibility & responsiveness
Value of a Second Opinion	• Fitch is only NRSRO (other than S&P) that rates CDFIs • Informed credit opinions are critical in today's pressured credit environment • More opinions are preferred and can provide stronger levels of market liquidity • Fitch is highly regarded as a thought leader in USPF
Value of Data	• Medians / Peer Studies • Issuer Portal Access • Webinars & Special Research

Focused Public Finance Research

Comprehensive New Issue Report

- Concise and informative, widely regarded as the best in the industry
- Investors rely on Fitch research to inform their own analysis

Fitch Comparative Analytical Tools (FACT)

- Facilitates a better understanding of key credit metrics
- Allows users to compare credit profiles for selected Fitch rated issuers

Fitch Analytical Stress Test (FAST)

- Issuer specific data supports Fitch's through-the-cycle ratings
- Provides base case and ratings case scenarios

Research Straight to Your Inbox

- Research reports are distributed based on sector coverage
- Each email provides an overview of the report and includes a link to a **free report download**
- Follow-up discussions with respective sector analysts are encouraged

Contact Details

Karen Fitzgerald, Senior Director

Sector Lead - Community Development & Social Lending

karen.fitzgerald@fitchratings.com

Jessica Soltz-Rudd, Managing Director

U.S. Public Finance, Head of Business & Relationship Management

jessica.soltzrudd@fitchratings.com

Teresa Galicia

Director, Community Development & Social Lending

teresa.galicia@fitchratings.com

Kasia Reed

Director, Community Development & Social Lending

kasia.reed@fitchratings.com

John Mante

Associate Director, Community Development & Social Lending

john.mante@fitchratings.com

fitchratings.com

New York
33 Whitehall Street
New York, NY
10004

London
30 North Colonnade
Canary Wharf
London, E14 5GN

San Francisco
One Post Street, Suite 900
San Francisco, CA
94104

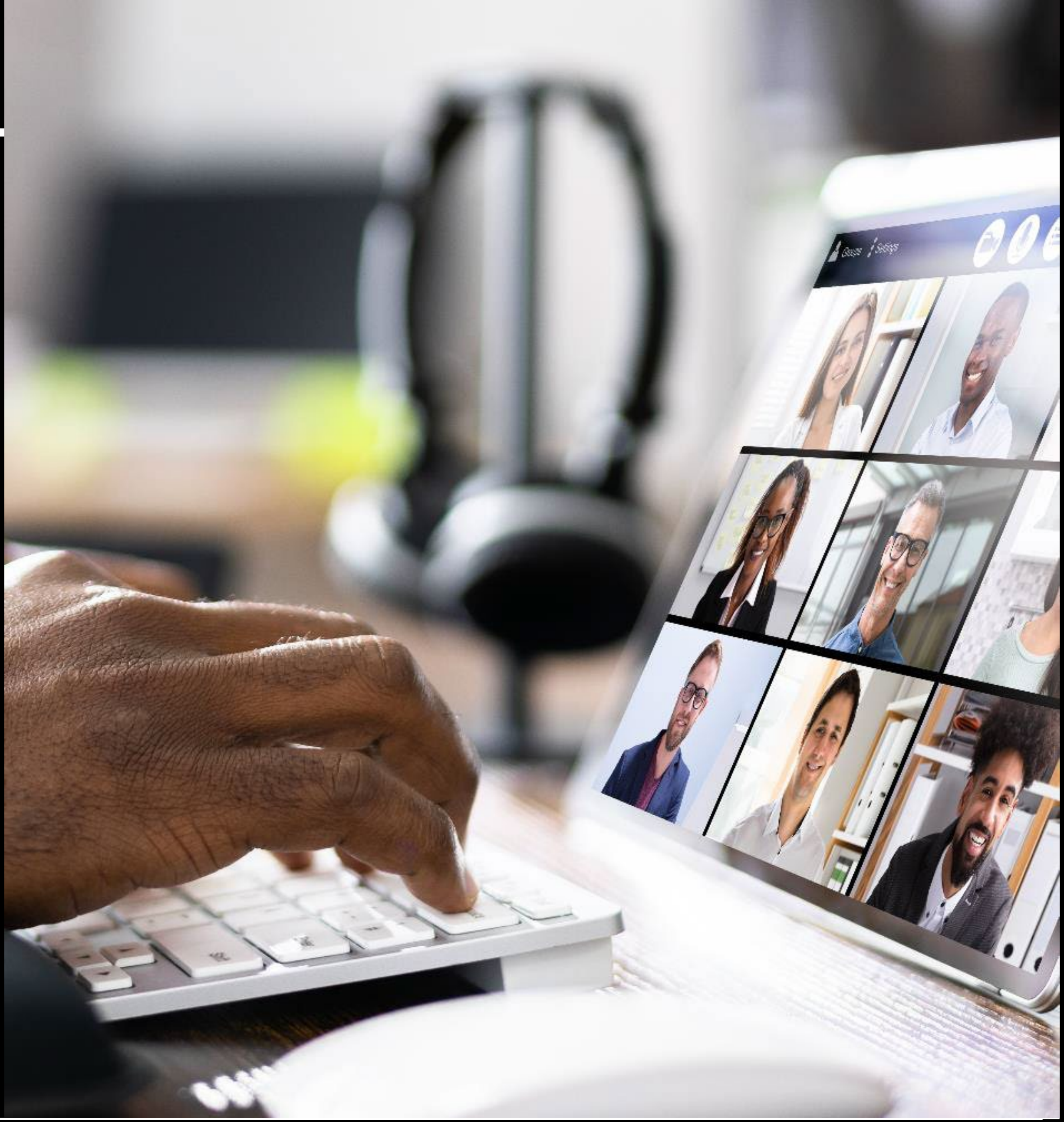
Chicago
One North Wacker Drive
Chicago, IL 60606

Rating Agencies

Questions?

Hybrid Work Culture

Debbie Herrera
Director,
Human Resources,
CHFA



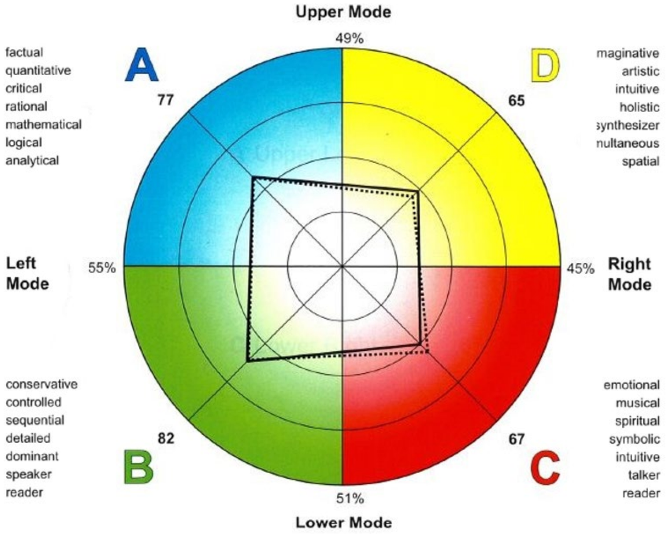
hybrid work environment

Debbie Herrera, *Director, Human Resources*

hybrid: what does it mean for chfa

The future of work is hybrid.

The workplace is no longer merely a physical location where we go to work. CHFA values employee centered collaboration, engagement and connection as fundamental to our culture. CHFA will offer flexibility and choice to employees as to where they choose to work while encouraging a blend of remote and in person work that is appropriate and unique to each person.



Culture/People

Behaviors and skills to successfully work in a hybrid environment while supporting our collaborative and inclusive culture.

Behaviors supporting health and safety of all employees working in person.

Technology

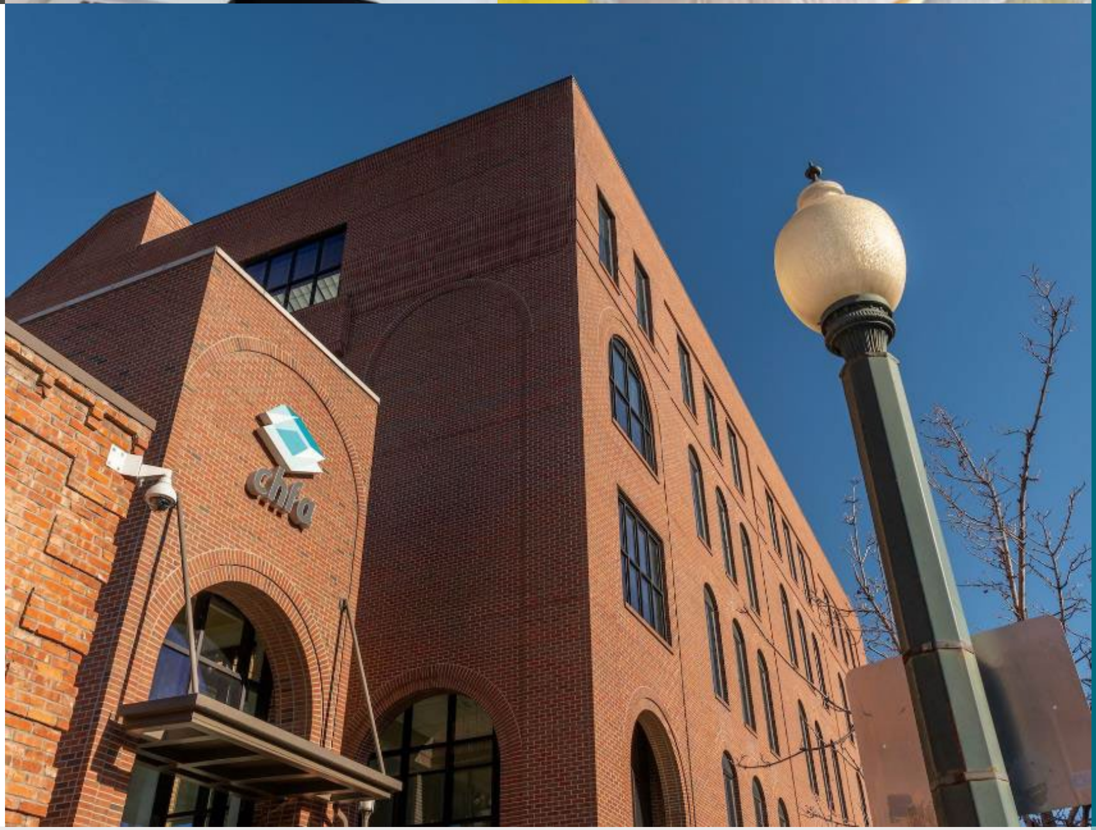
Optimize technology for ease of use and inclusivity in hybrid work environment

Ensure technology facilitates business continuity and work from anywhere

Space

Optimize in-person work areas based on vision and employee choice of work style, location and frequency

Optimize physical spaces for health and safety



the shift

Primary reasons to work **in office**

Social Connection	43%
Collaboration with Colleagues	32%
Energy – Face to Face	24%
Office Env. & Equipment	21%

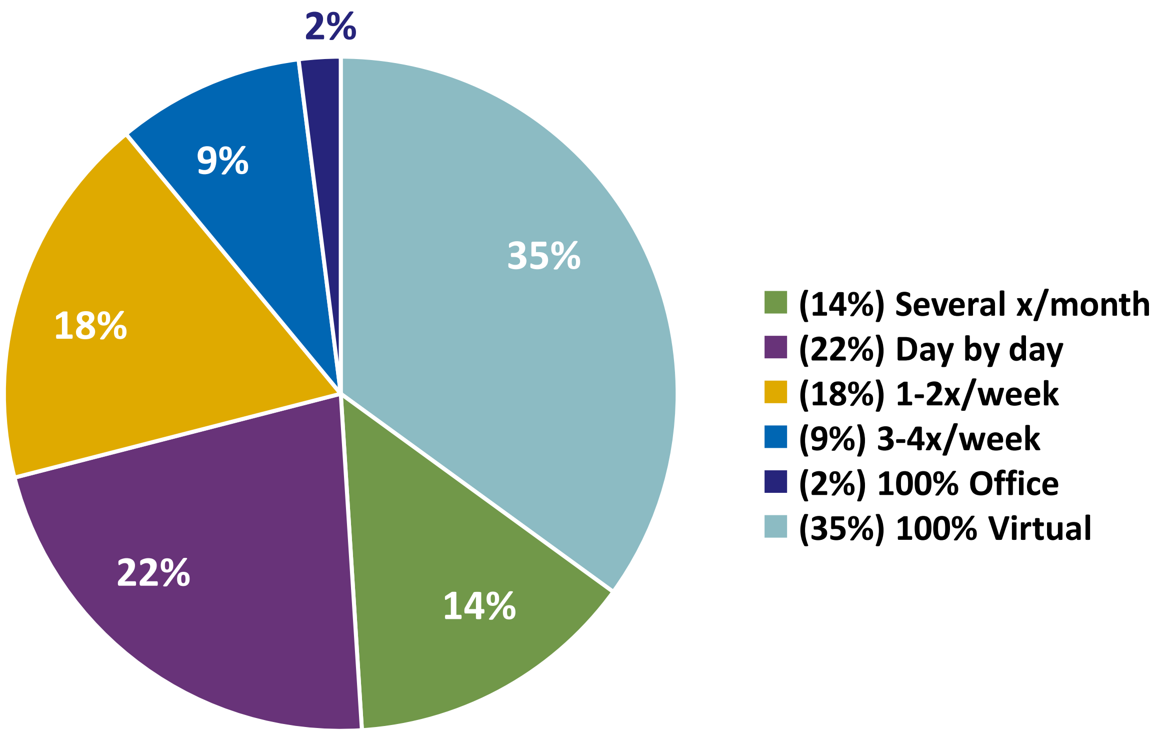
Primary reasons to work **virtually**

Commute	86%
Focus	75%
Productivity	74%
Physical Health	57%
Family/Child/Elder/Pet	55%

As of April 2022

hybrid work

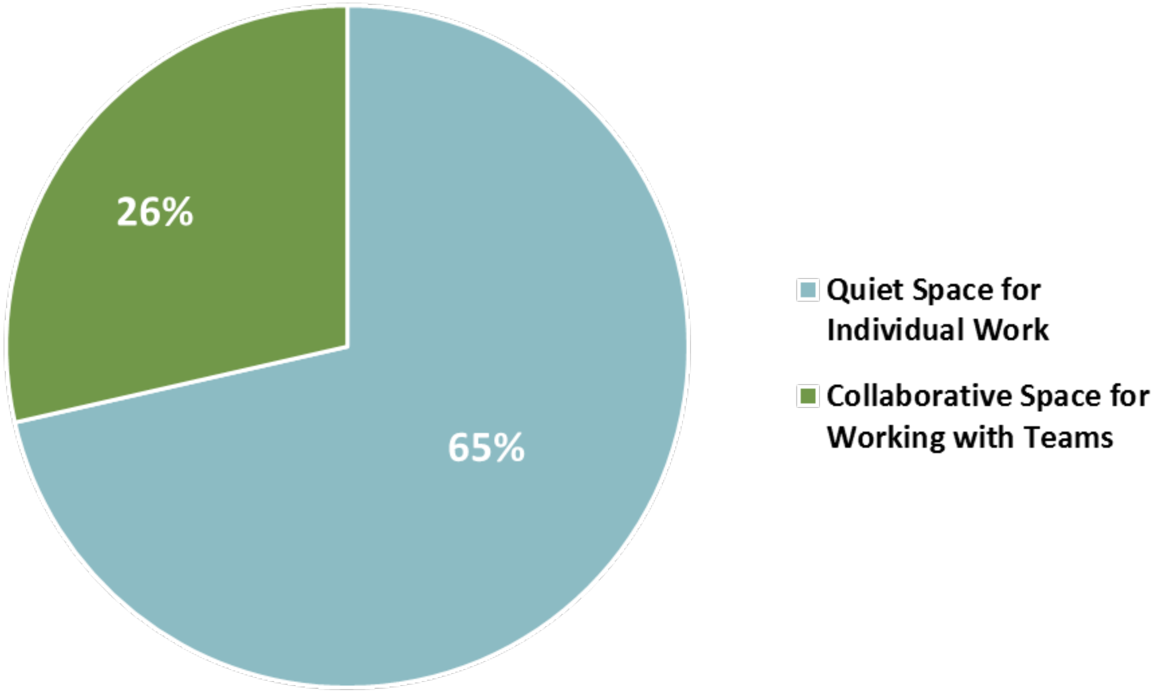
Choice and balanced by business need



As of April 2022

ideal workspace

- Continued flexibility and choice
- Quiet focused space and options for in-person collaboration
- No changes to the space at this time; will continue to monitor going forward.
- New AV in meeting rooms: small and mid-sized rooms next week



connection options

In-person

- Days of Service and Volunteer Events
- Monthly Coffee Cart
- Community Events, Fairs, Festivals
- Neighborhood Game Boards
- Mission Expedition
- All Staff Events

Hybrid

- All Staff Meetings
- CHFA Chat
- Select Corporate Giving and Community Events*

Virtual

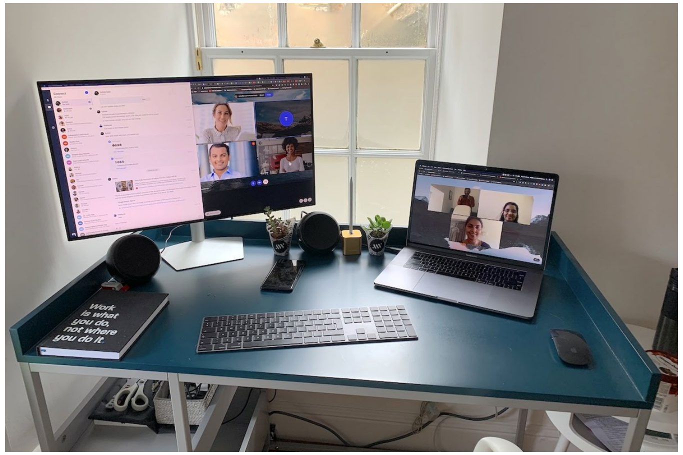
- Tuesday Virtual Coffee
- Friday Focus
- Continuing the Conversation Series
- Virtual Games

*As per host organization

technology – hybrid

Home

- All staff have laptop for Teams



Office

- Webcams added to workstations
- Additional meeting room displays and cameras added
- Book conference room and Teams
- Wear a head-set if in Teams meetings while in open spaces
- Practice sessions for meeting room use

chfa

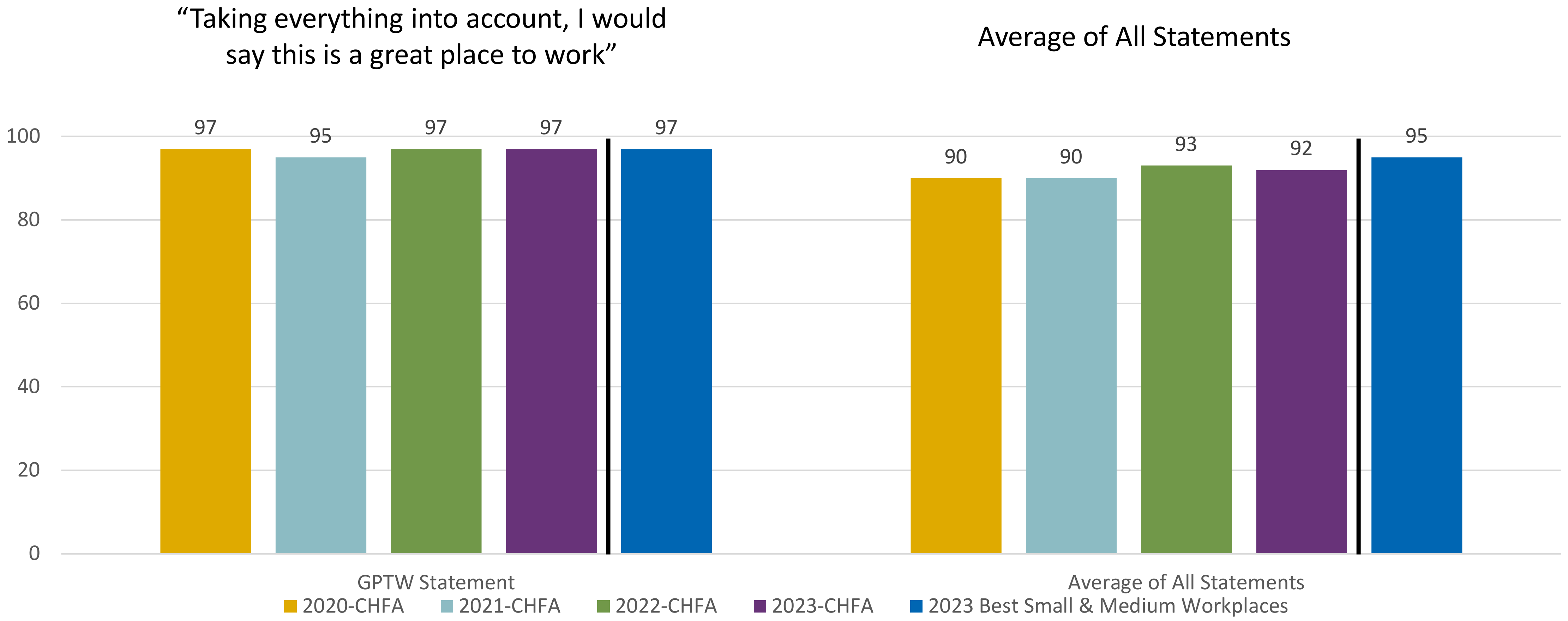
facilitated dialogue – hybrid

- What are the main challenges your organization has faced in transitioning to a remote or hybrid work environment?
- How has remote or hybrid work affected employee productivity and engagement within your organization?
- What strategies or tools has your organization implemented to foster effective communication and collaboration in a remote or hybrid work setup?
- How has remote or hybrid work impacted your organization's culture and employee well-being?

facilitated dialogue – hybrid

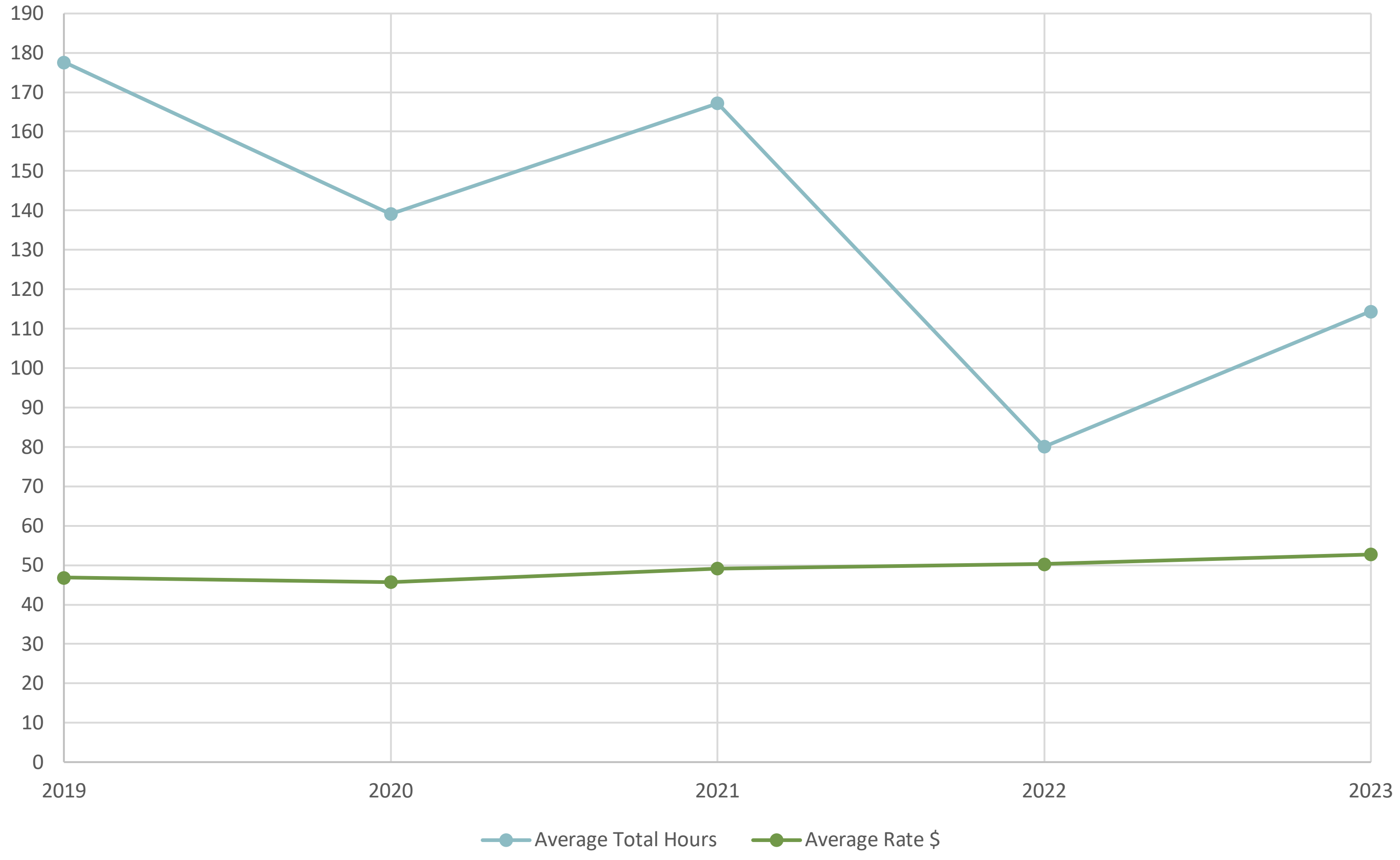
- What steps has your organization taken to ensure data security and protect sensitive information in a remote or hybrid work environment?
- Have you noticed any differences in leadership or management styles when it comes to leading remote or hybrid teams?
- How do you see the future of remote or hybrid work evolving in your organization and the industry as a whole?
- What are the key factors that determine whether a role is suitable for remote or hybrid work?
- How do you measure the success and effectiveness of remote or hybrid work arrangements within your organization?

chfa’s results



2023 results: Survey conducted in March 2024

overtime rate – 2019 to 2023



As of December 2023

virtual vs. in-person benefits

Virtual	In-person
• Flexibility • Cost-savings • Access to broader talent • Reduced environmental impact	• Collaboration and communication (and spontaneous interactions) • Social interaction • Non-verbal cues (role modeling, mentoring) • Workplace culture – sense of community

hybrid – best practices

- Meeting etiquette
  - Always include a Teams meeting invite
  - Book meeting rooms for in person participants
  - Specify if meeting participants should be in-person and /or video-on
  - Wear a head-set if in Teams meetings while in open workstation spaces
  - Consider use of audio/visual computer/table phone in conference room vs laptop
- Practice inclusion
  - Be cognizant to include others in conversations and meetings regardless of working in-person or remote
- Establish expectations for hybrid
- Be respectful!

future of work

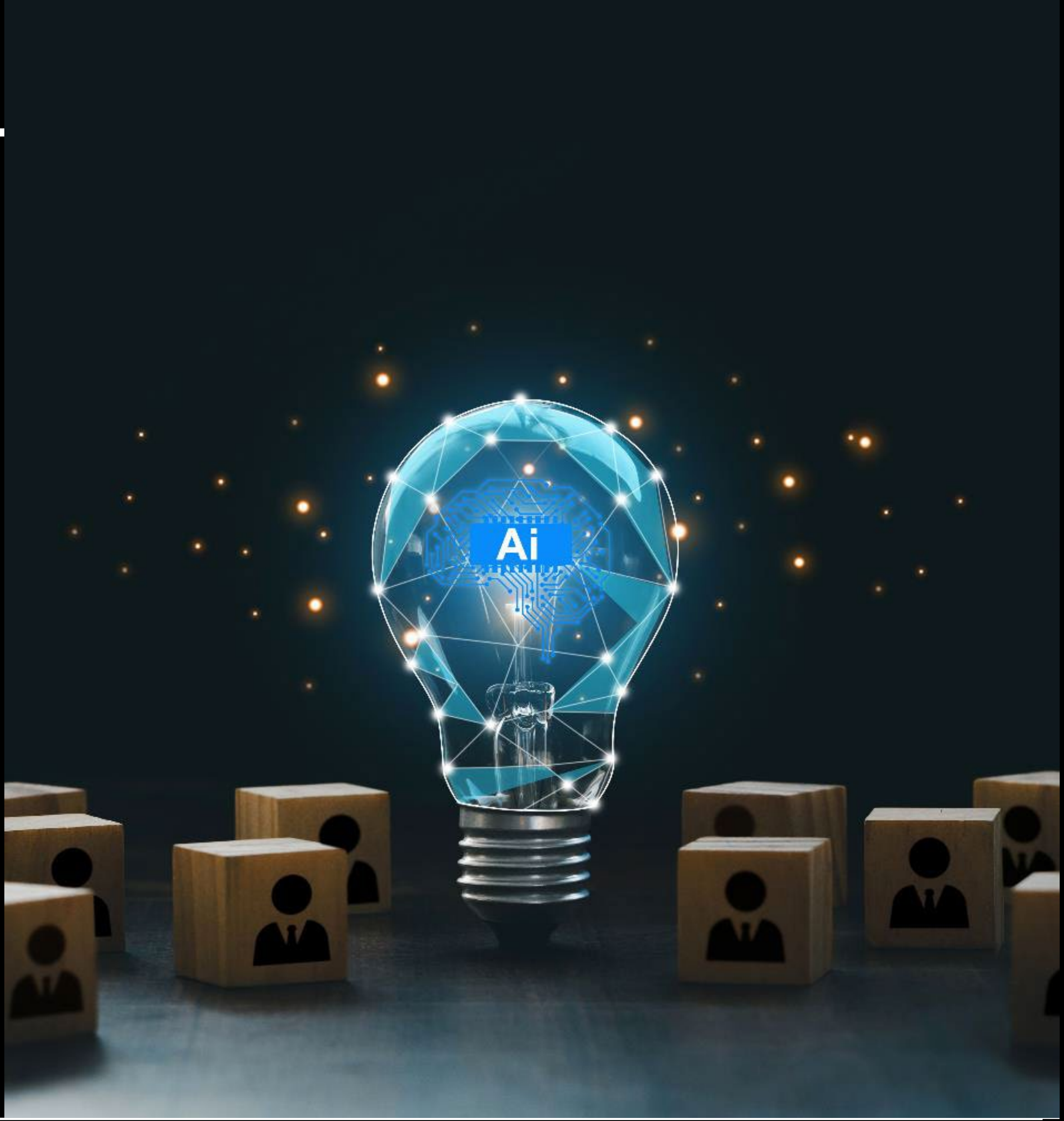
- Remote and flexibility
- Digital and remote collaboration tools
- Emphasis on well-being and mental health
- Continuous learning and skill development
- Purpose driven work
- Diverse and inclusive where individuals from different backgrounds feel valued and respected

thank you!

Artificial Intelligence (AI)

Ezri Terbush

Manager,
Information Security,
CHFA



introduction to artificial intelligence

Ezri Terbush, Information Security Manager

chfa's technology philosophy and ai

following/ lagging	mainstream	leading	bleeding edge

CHFA lives here

AI is here

what is artificial intelligence (ai)?

- Artificial intelligence (AI) is the ability of machines to perform tasks that are typically associated with human intelligence, such as learning and problem-solving.
- AI with natural language processing (NLP) refers to the branch of AI concerned with giving computers the ability to understand text and spoken words in much the same way human beings can.

what is artificial intelligence (ai)?

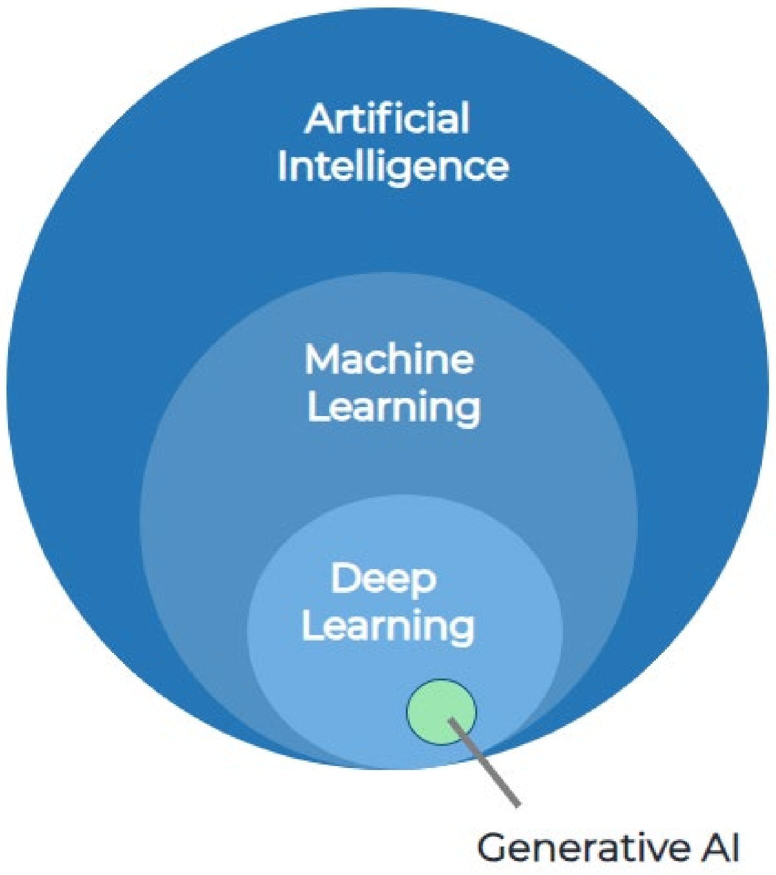
- Machine Learning (ML) is a branch of AI which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy.
- Machine learning models fall into three primary categories.
  - Supervised machine learning
  - Unsupervised machine learning
  - Semi-supervised learning
- Deep learning (DL) is a subset of ML algorithms that leverage artificial neural networks to develop relationships amongst data points.

Source: InfoTech Research Group - An AI Primer for Business Leaders Storyboard – ML and Deep Learning

what is artificial intelligence (ai)?

Generative AI (Gen AI)

A form of ML where, in response to prompts, a Gen AI platform can generate new outputs based upon its training data. Depending on its foundational model, a Gen AI platform will provide different modalities and use case applications.



what is artificial intelligence (ai)?

Large Language Models (LLMs) are a type of AI algorithm that uses deep learning techniques and massively large data sets to understand, summarize, generate and predict new content.

Source: TechTarget - large language models (LLMs)

what is artificial intelligence (ai)?

Public LLMs vs Domain Specific LLMs

- Public LLMs are trained on public data available on the internet and are prone to “hallucinations” which are query results that are not based on the data provided to the LLM. Additionally, using public data can result in Public LLMs showing bias based on the data ingested.
- Domain Specific LLMs use vetted data from specific sources which can answer questions specific to your business, your customers and possibly even your industry.

what is artificial intelligence (ai)?

Open Source LLMs vs Closed Source LLMs

- Open Source LLMs are language models whose source code is publicly available and can be freely accessed, used, modified, and distributed by anyone. Open-source models encourage collaboration, transparency, and community involvement.
- Closed Source LLMs are language models whose source code is not publicly available. They are developed and maintained by organizations or companies that typically keep the underlying code proprietary and closed to the public. These models are often developed as commercial products and may require licenses or subscriptions for their use. The specific details of their architecture, training data, and algorithms are generally not accessible to the public.

Source: Medium – Types of Open Source LLMs

what are the benefits of ai?

Efficiencies

- The most immediate benefits of Artificial Intelligence is that it has the potential to significantly reduce errors and increase accuracy and precision while freeing up time for humans to perform more meaningful tasks.
- Decisions made by AI are determined by the information it was trained on and a certain set of algorithms. When programmed properly, output errors can be reduced significantly.
    - For example, in 2020 the AI, DeepMind, was able to predict the shape of proteins using a tool called AlphaFold. To date DeepMind has been able to predict approximately 200,000,000 proteins which is nearly every protein known to science.

Source: New York Times - A.I. Predicts the Shape of Nearly Every Protein Known to Science

what are the benefits of ai?

- Formatting
  - Generative AI models like ChatGPT can create documents based on plain English prompts that can be used to build a foundation for documents and communications.
  - AI can also summarize documents and communications to highlight key points and takeaways.
  - Any AI output, regardless of the complexity, should be evaluated for accuracy as part of responsible AI usage.

what are the benefits of ai?

Innovation

- Here are examples of some different ways to leverage artificial intelligence to encourage business innovation:
  - Recommending new ideas based on machine learning algorithms
  - Utilize data collection and analysis for uncovering patterns that can help in predicting future events
  - Leveraging data mining and analysis to improve decision-making processes
  - Assist in recognizing potential risks associated with new ideas, such as market risks, operational risks, and financial risks

Source: LinkedIn - Unlocking growth: How AI is Fueling Innovation and New Opportunities in Business

what are the benefits of ai?

Information Technology and Security

- Protecting data across hybrid cloud environments saving valuable time in detecting and remediating potential issues in real time.
- Generating more accurate and prioritized threats by automating incident responses and accelerating alert investigations.
- Balancing user access needs and security by analyzing the risk of each login attempt and verifying users through behavioral data, simplifying access for verified users and reducing the potential of fraud

Source: IBM - AI to accelerate your security defenses

what are the risks of ai?

AI and the future of the workforce

- New research reveals that nearly one-quarter (23 percent) of U.S. workers are concerned that workplace automation leveraging AI will replace their job in the next five years. Workplace automation has already impacted nearly 10 percent of U.S. workers.
- AI may displace some jobs but will result in the creation of new jobs in data validation, auditing, and other oversight roles related to AI due diligence and transparency. AI as a tool is designed to create efficiencies but it has its limits. Work will always need a human perspective because what AI outputs needs to be vetted for accuracy and bias.

Source: SHRM - [Ask HR: Will AI Replace Workers?]

what are the risks of ai?

CHFA's responsible approach to AI

- On October 30, 2023, President Biden signed an executive order on safe, secure, and trustworthy AI.
- The Executive Order establishes guidance on, but not limited to:
  - AI safety and security
  - The protection of Americans' privacy
  - Prioritizing advances in equity and civil rights
  - Advocating for consumers and workers
  - Promoting innovation and competition

Source: The White House - FACT SHEET: President Biden Issues Executive Order on Safe, Secure, and Trustworthy Artificial Intelligence

what are the risks of ai?

CHFA's responsible approach to AI

- CHFA aligns to the National Institute of Standards' (NIST) information security and privacy control framework.
- NIST is setting the standards for an AI risk management framework to better manage risks to individuals, organizations, and society associated with artificial intelligence (AI). The NIST AI Risk Management Framework (AI RMF) is intended to improve the ability to incorporate trustworthiness considerations into the design, development, use, and evaluation of AI products, services, and systems.
- The framework is undergoing rigorous testing prior to its publication

Source: NIST – AI Risk Management Framework

what are the risks of ai?

CHFA’s responsible approach to AI

- As part of our due diligence, CHFA is evaluating AI solutions using guidance provided by the following entities:
  - InfoTech Research Group
  - National Fair Housing Alliance
  - International Association of Privacy Professionals
- The Federal Trade Commission (FTC) and officials from the Department of Justice (DOJ), Consumer Financial Protection Bureau (CFPB), and US Equal Employment Opportunity Commission (EEOC) have reiterated the importance of fairness, equality, and justice as a core tenant of AI system evaluation.

Source: FTC - [FTC Chair Khan and Officials from DOJ, CFPB and EEOC Release Joint Statement on AI]

chfa

what are the risks of ai?

Automated systems may contribute to unlawful discrimination and otherwise violate federal law. Potential discrimination in automated systems may come from different sources, including problems with:

- **Data and Datasets:** Automated system outcomes can be skewed by unrepresentative or imbalanced datasets, datasets that incorporate historical bias, or datasets that contain other types of errors. Automated systems also can correlate data with protected classes, which can lead to discriminatory outcomes.
- **Model Opacity and Access:** Many automated systems are “black boxes” whose internal workings are not clear to most people and, in some cases, even the developer of the tool. This lack of transparency often makes it all the more difficult for developers, businesses, and individuals to know whether an automated system is fair.
- **Design and Use:** Developers do not always understand or account for the contexts in which private or public entities will use their automated systems. Developers may design a system on the basis of flawed assumptions about its users, relevant context, or the underlying practices or procedures it may replace.

Source: FTC - Joint statement on enforcement efforts against discrimination and bias in automated systems

what are the risks of ai?

AI Blind Spots

- Other technology manifested bias can occur when:
  - There are biased feedback loops
  - Insufficient or no testing for bias in data outputs
  - Lack of diversity in data sets

Source: NFHA – How Technologies Manifest Bias

what are the risks of ai?

Real World Examples

- ChatGPT Hallucinates a Court Case
  - Steven A. Schwartz, fellow lawyer Peter LoDuca and law firm Levidow, Levidow & Oberman, were fined $5,000 for submitting fake citations in a court filing. The judge found the lawyers acted in bad faith and made "acts of conscious avoidance and false and misleading statements to the court." In a written opinion, Judge P. Kevin Castel said lawyers had to ensure their filings were accurate, even though there was nothing "inherently improper" about using artificial intelligence in assisting with legal work.
  - "[Schwartz] stated in the court [hearing], 'I just never could imagine that ChatGPT would fabricate cases.'"

Source: UNSW Canberra – [This US lawyer used ChatGPT to research a legal brief with embarrassing results. We could all learn from his error]

what are the risks of ai?

Real World Examples

- Black patients lose out on critical care due to racist algorithm bias
  - To compute who should qualify for extra care, the algorithm's designers used previous patients' health care spending as a proxy for medical needs.
  - Because the recorded health care costs of black individuals were on par with those of healthier white people, the program was less likely to flag eligible black patients for high-risk care management.
  - Implicit racial bias also contributes to the health care disparity. Because black patients often experience this kind of bias, they receive lower-quality care and have less trust in the doctors whom they feel are exhibiting bias.

Source: Scientific American – [Racial Bias Found in a Major Health Care Risk Algorithm]

what are the risks of ai?

Privacy concerns surrounding AI

- AI systems often rely on vast data to train their algorithms and improve performance. This data can include personal information such as names, addresses, financial information, and sensitive information such as medical records and social security numbers. The collection and processing of this data can raise concerns about how it is being used and who has access to it.
- The main privacy concerns surrounding AI is the potential for data breaches and unauthorized access to personal information. With so much data being collected and processed, there is a risk that it could fall into the wrong hands, either through hacking or other security breaches.

Source: Economic Times – [AI and Privacy: The privacy concerns surrounding AI, its potential impact on personal data]

what are the risks of ai?

Privacy concerns surrounding AI

- According to ChatGPT's privacy policy, it gathers its information from three sources:
  - Account information that you enter when you sign up or pay for a premium plan (your name, contact information, account credentials, payment card information).
  - Identifying data it pulls from your device or browser, like your IP address, location, and usage data.
  - Information that you type into the chatbot itself (the input, file uploads, or feedback that you provide)
- OpenAI shares this data with vendors, service providers, other businesses, affiliates, legal entities, and AI trainers who review your conversations. Also, the data collected is retained for "only as long as we need in order to provide our service to you, or for other legitimate business purposes."
- This information may be used to provide outputs to future public queries potentially exposing sensitive and confidential information.

Source: Bitdefender – [What data Chat GPT collects about you, and why is this important for your digital privacy]

what are the risks of ai?

Privacy concerns surrounding AI

- Samsung Bans ChatGPT Among Employees After Sensitive Code Leak
  - The crackdown was prompted by the discovery of an accidental leak of sensitive internal source code by an engineer who uploaded it to ChatGPT last month.
  - Although the severity of the leak remains unclear, Samsung is concerned that data shared with AI chatbots get stored on servers owned by companies operating the service like OpenAI, Microsoft, and Google—with no easy way to access and delete them.
  - The company also fears that the sensitive data shared with the likes of ChatGPT could end up being served to other users, the report adds.
  - By default, ChatGPT saves a user's chat history and uses the conversations to train its models further, and while the platform allows users to disable this manually, it is unclear if this option retroactively applies to older chats.

Source: Forbes – Samsung Bans ChatGPT Among Employees After Sensitive Code Leak

what are the risks of ai?

Spear phishing

- When you combine spear phishing with AI technology, you create shocking results. Scammers who hoard breached data from hacked websites can use AI technology to read that data and organize it into a highly targeted phishing attack.

Voice cloning

- Just from analyzing a small clip from an online video, scammers can replicate a voice to a chilling degree of accuracy and use it to call your loved ones pretending to be you. Phishing scammers can use voice cloning tech in numerous ways, and they all involve deception, preying on the weak, and pulling at your heartstrings.

Source: Microsoft – [How AI is changing phishing scams]

what are the risks of ai?

Automated malware

- While software like ChatGPT has some protections to prevent users from creating malicious code, experts can use clever techniques to bypass it and create malware. For example, one researcher was able to find a loophole and create a nearly undetectable complex data-theft executable. The program had the sophistication of malware created by a state-sponsored threat actor.

More sophisticated attacks

- Threat actors can use AI to create advanced malware, impersonate others for scams, and poison AI training data. AI can also help attackers evade security systems like voice recognition software in attacks called adversarial attacks.

Source: Malwarebytes – AI in Cyber Security: Risks of AI

how can ai be used responsibly?

- AI is a powerful tool that has many uses; however, it can introduce additional risk to the organization by opening up exposure to privacy risks, cyber security risks, fraud risks, not to mention that it can have unintended consequences impacting your customers and the communities they live in.
- Both individuals and organizations must take a holistic and proactive approach to use the technology safely.

how can ai be used responsibly?

Audit any AI systems you use

- By reviewing the adoption of AI technology at the vendor level, and the reputation of any AI system that they have adopted, helps to avoid security and privacy issues.
- Periodic audits of AI generated systems, including their data outputs, helps to identify vulnerabilities and highlight areas of AI risks and needed improvements.

Source: Malwarebytes – AI in Cyber Security: Risks of AI

how can ai be used responsibly?

Restrict personal information from being shared to AI systems

- With incidents of sensitive and confidential information being exposed by artificial intelligence on the rise, we need to better understand the AI risks to privacy.
  - Certain actions where companies have used AI to aggregate seemingly innocuous data to for efficiency reasons have ended up posing security risks and have breached privacy regulations like HIPAA.
  - Understanding how AI systems access and handle data including where that data is located as well as AI secondary uses of that data can provide insight into how to avoid unintended privacy incidents.

Source: Malwarebytes – AI in Cyber Security: Risks of AI

how can ai be used responsibly?

Data security

- AI relies on its training data to deliver good outcomes. If the data is modified or poisoned, AI can deliver unexpected and dangerous results. To protect AI from data poisoning, organizations must invest in their security infrastructure to provide the necessary safeguards to prevent the exposure and manipulations of sensitive and confidential data.

how can ai be used responsibly?

Staff training

- The risks of AI are quite broad. Consult with experts in cyber security and AI to train your employees in AI risk management. Staff should learn to fact-check emails that may potentially be phishing attacks designed by AI. Likewise, they should avoid opening unsolicited software that could be malware created by artificial intelligence.

Source: Malwarebytes – AI in Cyber Security: Risks of AI

how can ai be used responsibly?

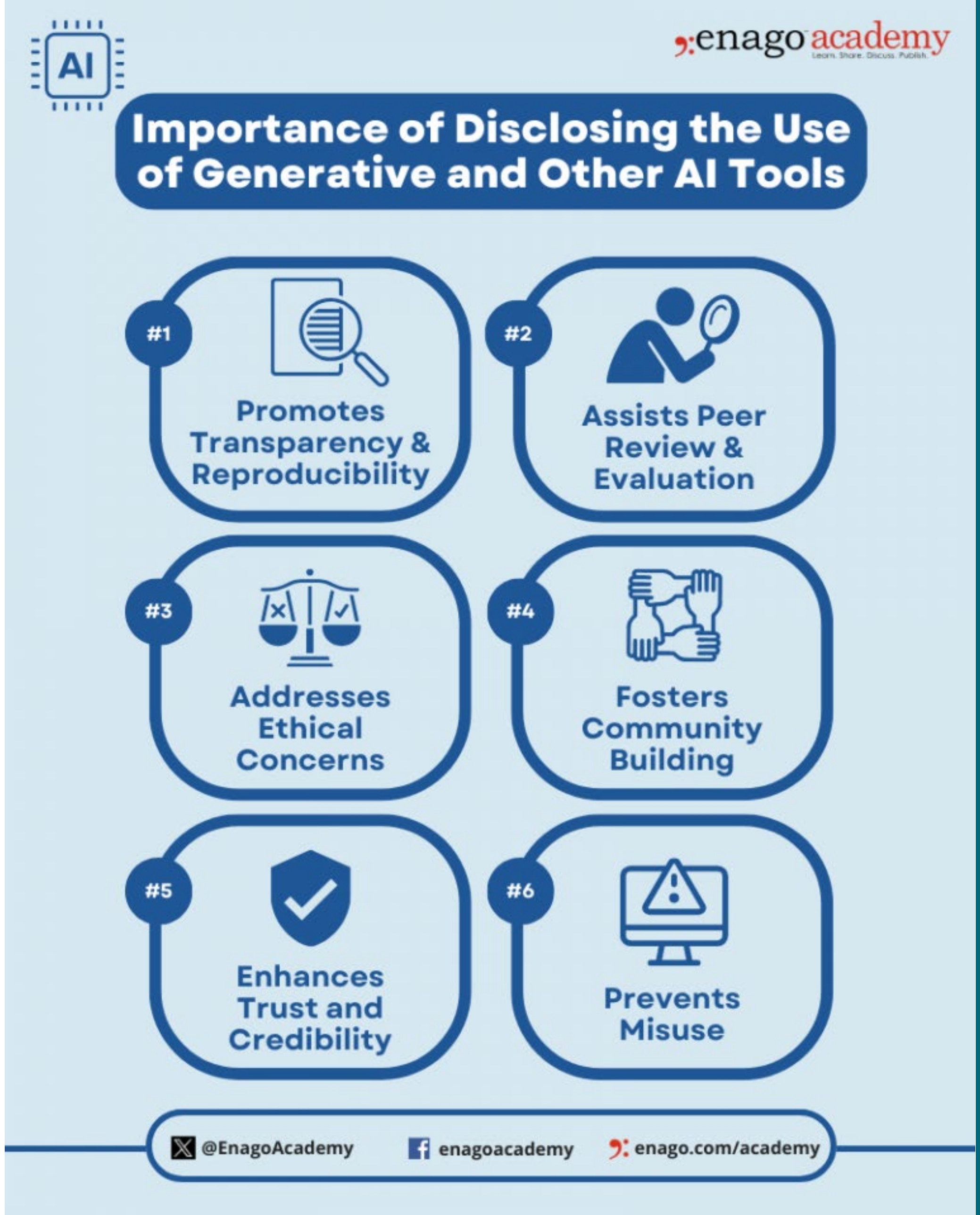
Appropriate disclosure regarding the use of AI

- It has become imperative for businesses to adopt best practices for disclosing the use of AI tools in report generation. Such practices not only enhance the transparency and reproducibility of research but also ensures ethical considerations are adequately addressed.
- The transparency of methods, data sources, and limitations is not just an academic exercise but a moral and scientific obligation. It ensures the integrity of research findings, facilitates reproducibility, and safeguards against unintended consequences.

Source: enago academy – Disclosing the Use of Generative AI: Best practices for authors in manuscript preparation

how can ai be used responsibly?

Disclosing AI tools used for report generation is of paramount importance for several critical reasons



Source: enago academy – [Disclosing the Use of Generative AI: Best practices for authors in manuscript preparation]

chfa

how can ai be used responsibly?

Appropriate disclosure regarding the use of AI

- The ethical stance against designating LLMs and related AI tools without an appropriate governance and review framework is grounded in the principles of responsibility, accountability, transparency, and the understanding of AI's role as a tool in the research process. Authorship carries with it a responsibility to stand behind the research, take accountability for its content, and address any issues or concerns raised by readers, reviewers, or the wider research community. AI tools, being non-legal entities, cannot fulfill this responsibility as they lack the capacity for moral judgment and accountability.

Source: enago academy – Disclosing the Use of Generative AI: Best practices for authors in manuscript preparation

how can ai be used responsibly?

Next steps in developing a responsible AI adoption framework

- How do you maintain efficiency while reviewing outputs for factual errors or unintended bias?
- What due diligence is necessary to ensure that what is produced using AI is accurate and serves our company's mission?
- How is AI being used successfully in our sector?
- What new AI roles and skills will we require?
- What are the costs and complexities of leveraging an AI solution?

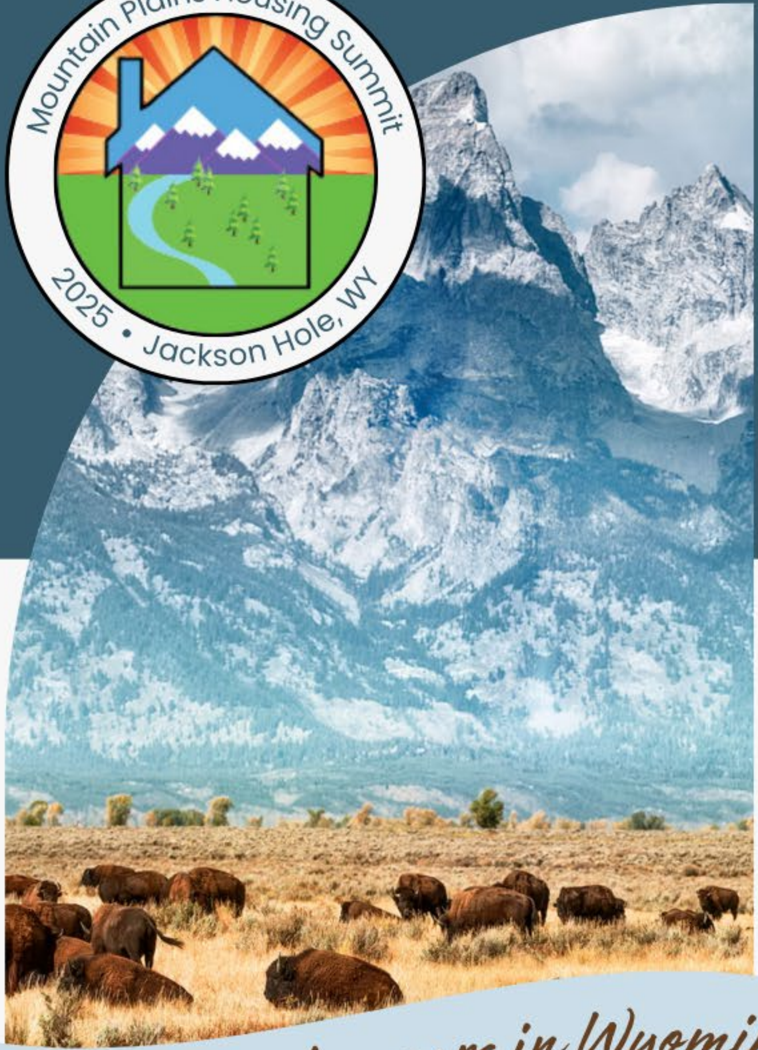
thank you!

Mountain Plains Housing Summit

2024 • Colorado Springs, CO

Thank you!

Mountain Plains Housing Summit
2025 • Jackson Hole, WY



celebrating fifty years in Wyoming

Save the Date

Join us in Jackson Hole for MPHS 2025!

• May 5 - 7, 2025

WCDA
EST. 1975