Financial Sector Outlook

- Minimal Underwriting Activity
- Consumer Banking Headwinds

**Personal savings** as a percent of **disposable income** has reached its lowest rate since 2005 (near all time lows)

**Significant increase in consumer credit usage**

**XLF / SPX YoY**

**Consumer Savings vs Credit Usage**

- **Personal Savings Rate**
- **Consumer Credit Usage**
Derivatives Market Outlook

Market Characteristics

- Contracts involving 2(+) parties betting on performance of an underlying asset
  - Interest rates, commodities, equities, ETFs, credit, FX
- Increased volume with a risk-on environment (VIX) and decreased with an economic slow-down

Market Outlook

- Notional value of $632tn (OTC and exchange traded)
  - An increase of 144% since 2016
  - '22 volume increase lead primarily by interest rate and commodities

Q4 2021 v Q2 2022
Notional Value of Exchange and OTC Derivatives (trillions)

Q4 2021 v Q2 2022
Gross Market Value of Outstanding Commodities Derivatives (trillions)

Q2 2020 v 2022
Total Notional Amount Outstanding Commodities (billions)

Largely grain and oil
Market leader trading at Covid lows

Attractive long-term derivative outlook

Portfolio diversification
Our Financial Holdings

<table>
<thead>
<tr>
<th>S&amp;P Global</th>
<th>The Blackstone Group</th>
<th>Morgan Stanley</th>
<th>Financial Exchanges &amp; Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Correlation: 0.458</strong></td>
<td><strong>Correlation: 0.394</strong></td>
<td><strong>Correlation: 0.428</strong></td>
<td><strong>Correlation: 0.381</strong></td>
</tr>
<tr>
<td>Ratings/Data Providers</td>
<td>Private Equity/Real Estate</td>
<td>Diversified Banking</td>
<td>Diversified Banking</td>
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<tr>
<td><strong>Factors to Watch:</strong></td>
<td></td>
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</tr>
<tr>
<td>Growth</td>
<td></td>
<td>Size</td>
<td>Size</td>
</tr>
<tr>
<td>Profitability</td>
<td></td>
<td>Volatility</td>
<td>Value</td>
</tr>
<tr>
<td>Size</td>
<td></td>
<td></td>
<td>Volatility</td>
</tr>
<tr>
<td><strong>5th Quintile:</strong></td>
<td><strong>4th Quintile:</strong></td>
<td><strong>2nd Quintile:</strong></td>
<td><strong>4th Quintile:</strong></td>
</tr>
<tr>
<td>Value</td>
<td>Value</td>
<td>Value</td>
<td>Growth</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CME</th>
<th>JPM</th>
<th>SPGI</th>
<th>BX</th>
<th>MS</th>
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<tr>
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<td>0.458</td>
<td>0.394</td>
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<tr>
<td>0.381</td>
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<td>0.5</td>
<td>0.599</td>
<td>0.793</td>
</tr>
<tr>
<td>0.458</td>
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<td>1</td>
<td>0.666</td>
<td>0.58</td>
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<tr>
<td>0.394</td>
<td>0.599</td>
<td>0.666</td>
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<td>0.7234</td>
</tr>
<tr>
<td>0.428</td>
<td>0.793</td>
<td>0.58</td>
<td>0.724</td>
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</tr>
</tbody>
</table>

**Factors to Watch:**
- Profitability
- Size
- Value
- Growth

**3rd Quintile**
- Value

**4th Quintile**
- Growth
Revenue Breakdown

- Electronic trading fees
- Brokerage commissions
- Surcharges for privately-negotiated transactions
- Portfolio services

Volume Dependent!

Clearing and Transaction Fees

- Collateral management
- Equity membership fees

Market Data and Information Services

Subscription based derivative data provider

Clearing and Transaction Fees Breakdown

- Primarily generates income by charging fees on exchange traded and OTC derivative contracts across 6 asset classes

Interest Rates
- Energy
- Metal
- FX
- Interest Rate Swaps
- Agriculture
- Cash Market Business

*acquisitions

Brokertec
EBS
Other Cash Market

23.90%
16%
13.10%
4.20%
3.40%
1.30%
9.80%
8.40%
1.30%
3.70%
3.50%
Firm Structure

2002 - CME IPO

2005 - CBOT IPO

2008 - NYMEX acquisition (metals and energy)

2012 - CME acquires Kansas City Board of Trade

2018 - NEX acquisition (FX platforms)

Hon Terence A Duffy – “Duffy”

Chairman/CEO – Tenure 20.8 yrs

John W Piertrowicz

Chief Financial Officer – Tenure 13.8 yrs

Julie Holzrichter

Chief Operating Officer – Tenure 8.3 yrs
Price Performance

Volume and RPC Growth

Volume increase; RPC decrease

Consistent revenue growth despite volume and RPC volatility

Rate per Contract (dollars)

RPC decrease due to drop in future trading

Revenue Growth (millions)

Price Performance
Competitors

**CME Group**

- Price: $173.39 (-22.7%) LTM
- Market Cap: 62.41B
- EV/EBITDA: 18.72
- EPS: 7.51
- Beta: 0.72

**Revenue:**
- Clearing and Transaction Fees: 80%
- Market Data and Information Services: 11%
- Other: 10%

- Potentially priced in for decrease in futures volume
- Highly diversified with ability to maintain volume in other areas

**Ice**

- Price: $106.42 (-15.08%) LTM
- Market Cap: 59.5B
- EV/EBITDA: 15.82
- EPS: 5.49
- Beta: 0.98

**Revenue:**
- Exchanges: 56%
- Fixed Income and Data Services: 17%
- Reconciliation: 21%
- Mortgage Technology: 21%

- Higher RPC due to primarily transacting futures
- CME has more competitive fees/ highly profitable agricultural and energy futures

**Cboe**

- Price: $122.06 (+3.35%) LTM
- Market Cap: 12.95B
- EV/EBITDA: 12.51
- EPS: 6.06
- Beta: 0.56

**Revenue:**
- Options: 52%
- Equities: 35%
- Futures: 8%
- FX: 5%

- Less volume in futures
- Primarily trades multi-listed options (low profitability)
- Highest earning transactions are non-derivative equities
Valuations

### Current Price
$173.24

### DSO
359.7

### Market Cap
$62,314.43

### Preferred Stock
-$

### Outstanding Debt
$3,950.30

### Minority Interest
-$

### Cash and cash equivalents
$2,130.10

### Enterprise Value
$64,134.63

### EV/DSO
178.30

### EV/Sales (Terminal Value)
$12.79

### Implied Share Price
$191.09

### Upside Potential
10.30%

### Dividend Discount:

<table>
<thead>
<tr>
<th>PV of Dividends</th>
<th>Value</th>
<th>Per Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>FV of Dividends</td>
<td>17,744</td>
<td>49.33</td>
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### Terminal Value

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Per Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perpetual Growth</td>
<td>19,487</td>
<td>54.17</td>
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<tr>
<td>P/E</td>
<td>-44,228</td>
<td>-122.95</td>
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<tr>
<td>P/Book</td>
<td>4,790</td>
<td>13.31</td>
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<tr>
<td>P/Sales</td>
<td>56,358</td>
<td>156.67</td>
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<tr>
<td>P/CF</td>
<td>-36,409</td>
<td>-101.21</td>
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</table>

### Equity Value

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Per Share</th>
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<tr>
<td>Equity Value</td>
<td>74,102</td>
<td>206.00</td>
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### Free Cash Flow to Firm (FCFF)

<table>
<thead>
<tr>
<th>Present Value of FCFF</th>
<th>Value</th>
<th>Per Share</th>
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<tbody>
<tr>
<td>terminal value</td>
<td>4,031</td>
<td>11.2</td>
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### Terminal Value

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Per Share</th>
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<tbody>
<tr>
<td>Perpetual Growth</td>
<td>46,957</td>
<td>112.9</td>
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</table>

### EV/Sales
15.45

### EV/EBITDA
23.33

### EV/EBIT
26.52

### FV of Equity
$72,967 | 201.2

### Value of Equity

<table>
<thead>
<tr>
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<th>Value</th>
<th>Per Share</th>
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<tbody>
<tr>
<td>Current Price</td>
<td>73.15</td>
<td>3.0</td>
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<tr>
<td>- Preferred</td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td>- Minority Interest</td>
<td>0.0</td>
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</table>

### Current Price
$173.15

### Upside/Downside
18.97%

### Operating Scenario

<table>
<thead>
<tr>
<th>Historical Period</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$4,868.0</td>
<td>$4,883.6</td>
<td>$4,689.7</td>
</tr>
<tr>
<td>Operating Expense</td>
<td>$1,987.0</td>
<td>$1,798.7</td>
<td>$1,792.2</td>
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<tr>
<td>Depreciation and amortization</td>
<td>$158.6</td>
<td>$158.2</td>
<td>$147.8</td>
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<tr>
<td>Operating Income</td>
<td>$2,722.4</td>
<td>$2,931.7</td>
<td>$2,749.7</td>
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<tr>
<td>Total Non-Operating Income (Expense)</td>
<td>$299.8</td>
<td>$256.2</td>
<td>$377.3</td>
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<tr>
<td>EBIT</td>
<td>$2,423.1</td>
<td>$2,675.5</td>
<td>$2,372.4</td>
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<tr>
<td>Interest Expense</td>
<td>$178.0</td>
<td>$166.2</td>
<td>$166.9</td>
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<tr>
<td>EBT</td>
<td>$2,245.1</td>
<td>$2,509.3</td>
<td>$2,205.5</td>
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<tr>
<td>Taxes</td>
<td>$2,601.1</td>
<td>$2,841.7</td>
<td>$2,539.3</td>
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<tr>
<td>Net Income</td>
<td>$2,027.3</td>
<td>$2,226.0</td>
<td>$1,802.6</td>
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<tr>
<td>EBIT</td>
<td>$2,205.0</td>
<td>$2,392.3</td>
<td>$1,936.50</td>
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</tbody>
</table>

### Projection Period

<table>
<thead>
<tr>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$5,016.0</td>
<td>$5,317.0</td>
<td>$5,848.7</td>
<td>$6,550.5</td>
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<tr>
<td>Operating Expense</td>
<td>$2,988.0</td>
<td>$2,020.4</td>
<td>$2,222.4</td>
<td>$2,489.19</td>
</tr>
<tr>
<td>Depreciation and amortization</td>
<td>$156.0</td>
<td>$170.14</td>
<td>$187.16</td>
<td>$209.62</td>
</tr>
<tr>
<td>Operating Income</td>
<td>$2,792.0</td>
<td>$5,126.4</td>
<td>$5,439.0</td>
<td>$5,851.7</td>
</tr>
<tr>
<td>Total Non-Operating Income (Expense)</td>
<td>$588.3</td>
<td>$372.19</td>
<td>$409.42</td>
<td>$458.53</td>
</tr>
<tr>
<td>EBIT</td>
<td>$2,203.7</td>
<td>$2,754.2</td>
<td>$3,029.6</td>
<td>$3,393.2</td>
</tr>
<tr>
<td>Interest Expense</td>
<td>$164.7</td>
<td>$164.7</td>
<td>$164.7</td>
<td>$164.7</td>
</tr>
<tr>
<td>EBT</td>
<td>$2,368.4</td>
<td>$2,818.5</td>
<td>$3,194.3</td>
<td>$3,557.9</td>
</tr>
<tr>
<td>Taxes</td>
<td>$538.28</td>
<td>$565.51</td>
<td>$728.30</td>
<td>$811.19</td>
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<tr>
<td>Net Income</td>
<td>$1,829.1</td>
<td>$2,253.4</td>
<td>$2,466.0</td>
<td>$3,008.6</td>
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<tr>
<td>EBIT</td>
<td>$2,205.30</td>
<td>$2,392.20</td>
<td>$1,936.50</td>
<td>$1,993.82</td>
</tr>
<tr>
<td>FV of Equity</td>
<td>$72,967</td>
<td>201.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CME Group Inc Consensus Rating

| Buy | 57.9% |
| Hold | 26.3% |
| Sell | 15.8% |

### 12M Tgt Px
1623 |

### Last Price
173.21

### Pricing Currency
USD

### Return Potential
15.0%

### LTM Return
-19.1%
Recommendation

Buy 2% @ $171 before earnings (Feb 8)

Sell BX (2.77% of port) – up ~20% this month

*this would put us underweight financials – currently nearly equal weight at -.29 to SPY*
Thank You!
Any Questions?
<table>
<thead>
<tr>
<th>Description</th>
<th>September 30, 2022</th>
<th>December 31, 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>$15.0 million fixed rate notes due May 2023, stated rate of 4.30%</td>
<td>$16.6</td>
<td>$16.6</td>
</tr>
<tr>
<td>$570.0 million fixed rate notes due March 2023, stated rate of 3.00%</td>
<td>748.2</td>
<td>747.7</td>
</tr>
<tr>
<td>$500.0 million fixed rate notes due June 2028, stated rate of 3.75%</td>
<td>497.6</td>
<td>497.2</td>
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<tr>
<td>$790.0 million fixed rate notes due March 2022, stated rate of 2.65%</td>
<td>741.5</td>
<td>—</td>
</tr>
<tr>
<td>$750.0 million fixed rate notes due September 2043, stated rate of 3.50%</td>
<td>743.6</td>
<td>743.4</td>
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<tr>
<td>$500.0 million fixed rate notes due June 2048, stated rate of 4.15%</td>
<td>630.9</td>
<td>630.6</td>
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<tr>
<td>Total long-term debt</td>
<td>$3,211.6</td>
<td>$2,899.7</td>
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</table>

* NEX acquisition