10 Years After the Great Recession: How Have We Recovered? What Have We Learned?

John DeMairo
President & CEO
Agenda

- Introduction

- Hindsight is 20/20
  - Causes of the Global Financial Crisis “GFC”
  - Results: The Fallout From GFC
  - Fixes: What Repairs Were Done

- Where Are We Now – 10 Years Later
  - Market Performance
  - Investment Returns and Funding

- Future Impacts
  - Risks and Opportunities
Early 2009 Headlines…
October 10, 2007 to March 9, 2009

Index Performance

- MSCI AC World ex USA
- Bloomberg Barclays US Aggregate
- S&P 500
- MSCI EM (Emerging Markets)

Total Return

-70% -60% -50% -40% -30% -20% -10% 0% 10% 20%

1/08 7/08

-60.5% -59.5% -55.2% -7.2%
Consumer Confidence


Monthly Average
7/31/2000 – 2/28/09 = 94.7

2/28/09 level = 25.3
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Gramm Leach Biley Act (1999) repealed sections of Glass-Steagall that prohibited banks from engaging in underwriting and trading in securities markets.

Risk and Leverage are embedded within the banking system.

Created:
- Institutions “Too Big to Fail”
- Complex derivatives
- “Shadow Banking System”
1991: Affordable Housing Initiative
- Government Sponsored Enterprises “GSE” (Fannie Mae and Freddie Mac) lowered lending targets for low and moderate income qualifiers

1992: Federal Housing Enterprise Financial Safety and Soundness Act
- Act sets targets and goals for expanding loans and turbo charges sub-prime loans

RESULT:
- GSE’s share of mortgage market rose to 60% from 30% in 2000

We will do “$1 trillion lending and strive to eliminate “no” in our mortgage application process.

—Fannie Mae press release
Causes: Mortgage Loans Repackaged

Homes → Mortgages → Ginnie Mae → Agency assets → Agency-guaranteed MBS → Bond Investors
Causes: Structured Product Proliferation

...created structured products to sell to others

40 mortgages, $200,000 each = $8 million

**CMO**
Collateralized Mortgage Obligation

- **AAA-rated Tranche**
  Absorbs final $3 million losses

- **BBB-rated Tranche**
  Absorbs next $3 million losses

- **CCC-rated Tranche**
  Absorbs next $1 million losses

- **C-rated Tranche**
  Absorbs first $1 million losses

**Bond Investors**

**Hedge Funds**
Result: Risky Mortgages Made Riskier

Types of Mortgages Issued

- Agency
- Jumbo
- Alt-A
- Subprime
- Other
Result: Overextended Homeowners…

- **Total Debt Outstanding ($B):**
  - Home Mortgages (Left)
  - Consumer Credit (Left)

- **Debt Payments as % of Income (Right):**

**Graph Details:**
- Data spans from 1980 Q1 to 2018 Q2.
- Highlighted period shows significant increase in debt payments as a percentage of income during the late 2000s, indicating overextension among homebuyers.
Result: Housing Decline


Source: FRED

-8.52%
(9/06 to 3/09)
Result: Overextended Banks

➢ Decreased risk in the financial system

<table>
<thead>
<tr>
<th>Bank risk-weighted-capital ratio</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>8.5%</td>
</tr>
<tr>
<td>Europe</td>
<td>8.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bank liquid assets as % of short term liabilities</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>41.0%</td>
</tr>
<tr>
<td>Europe</td>
<td>35.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bank loan-to-deposit ratio</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>97.0%</td>
</tr>
<tr>
<td>Europe</td>
<td>139.0%</td>
</tr>
</tbody>
</table>

Source: FED, FDIC, ECB, JPMAM 2018
Central Bank Asset Growth Since 2009

- US Fed
- ECB ($)
- BOJ ($)

Fixes: Monetary Stimulus Worldwide

- $4.0T
- $4.9T
- $5.4T
Fixes: Asset Bailout

Deposits in failed and assisted US banks
% of GDP

- Great Depression
- Savings & Loan Crisis
- Great Recession

Source: FDIC, BEA, JPMAM, January 2016
Fixes: U.S. Interest Rates

USA Federal Funds Target Rate and Bloomberg Barclays US Aggregate

(INDEX) Bloomberg Barclays US Aggregate - Total Return
Recession Periods - United States
# Fixes: Reregulation, Dodd Frank

## Financial Agencies
- **Old**
- **New**
- **Old With New Powers**

## Lines of Reporting
- Can Request Information
- Has Authority to Examine

## Affected Parties

### Financial Agencies
- **OFAC/FinCEN**
- **State Regulatory Authorities and AG’s**
- **Federal Reserve**
- **Office of the Comptroller of the Currency**
- **Office of Financial Research**
- **Bureau of Consumer Financial Protection**
- **SEC**
- **CFTC**
- **FINRA**
- **FDIC**

### Lines of Reporting
- Investment Advisory
- Derivatives
- Consumer Lending
- Commercial Lending
- Broker Dealer
- Retail Banking
- Alternative Investments
- Investment Banking
- Payment & Clearing Systems

Source: Wall Street Journal; JPMorgan Chase
Fixes: Reregulation Outside U.S.: Basel Accords

- Basel 1: focused primarily on credit risk
- Basel 2: focused on credit risk, operational risk, and market risk (Never adopted in US)
- Basel 3: focuses on lending risks, balance sheet risk, and liquidity risk
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   • Risks and Opportunities
Current Market Cycle

The diagram illustrates the performance of the S&P 500 index over various market cycles, emphasizing the duration, total return, and annualized return for each period. The chart is color-coded to distinguish between bull markets, bear markets, and recessions.

Key highlights include:
- **1926-1934**: 3.7 years, 193.3% return, 34.1% annualized.
- **1934-1939**: 6 months, -21.8%, N/A.
- **1942-1951**: 2.8 years, -83.4%, -47.0%.
- **1951-1959**: 6.4 years, 143.7%, 14.9%.
- **1959-1967**: 1.6 years, -29.3%.
- **1967-1976**: 1.8 years, -42.6%.
- **1976-1984**: 3 months, -29.6%, N/A.
- **1984-1992**: 12.9 years, 845.2%, 19.0%.
- **1992-2001**: 12.8 years, 816.5%, 19.0%.
- **2001-2009**: 5.1 years, 108.4%, 15.5%.
- **2009-2018**: 9.8 years, 319.3%, 15.7%.

The chart also indicates the periods of economic recessions, marked by yellow bars, and the years of the bear and bull markets, providing a comprehensive view of market cycles over time.
U.S. Equity Market Volatility

Performance vs. Volatility
CBOE Volatility Index vs. S&P 500

- Flash Crash (SP500: -16%)
- US downgrade, Europe stress (SP500: -19.4%)
- Global slowdown, Fed uncertainty (SP500: -12.4%)
- Rising rates, peak growth (SP500: -19.8%)
- Inflation, trade concerns (SP500: -10.2%)

Average VIX: 19.6
U.S. Equity Market Dominance

Returns for 10 Years Ended December 2018

- S&P 500: 13.1%
- Europe: 6.81%
- Emerging Markets: 8.39%
- S&P 500 Growth: 14.8%
- S&P 500 Value: 11.2%
- Information Technology: 17.9%
- Energy: 2.7%

Long Term Average U.S. Equity Returns 7%
## Equity Markets Rolling 10-Year Returns

<table>
<thead>
<tr>
<th>PERIOD ENDED</th>
<th>WORLD</th>
<th>U.S.</th>
<th>NON-U.S.</th>
<th>EME</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 30, 2017</td>
<td>4.0%</td>
<td>7.3%</td>
<td>1.0%</td>
<td>1.9%</td>
</tr>
<tr>
<td>September 30, 2017</td>
<td>4.2%</td>
<td>7.6%</td>
<td>1.3%</td>
<td>1.3%</td>
</tr>
<tr>
<td>December 31, 2017</td>
<td>5.0%</td>
<td>8.6%</td>
<td>1.9%</td>
<td>1.7%</td>
</tr>
<tr>
<td>March 31, 2018</td>
<td>5.9%</td>
<td>9.6%</td>
<td>2.7%</td>
<td>3.0%</td>
</tr>
<tr>
<td>June 30, 2018</td>
<td>6.3%</td>
<td>10.2%</td>
<td>2.8%</td>
<td>2.3%</td>
</tr>
<tr>
<td>September 30, 2018</td>
<td>8.6%</td>
<td>12.0%</td>
<td>5.4%</td>
<td>5.4%</td>
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<tr>
<td>December 31, 2018</td>
<td>9.7%</td>
<td>13.2%</td>
<td>6.3%</td>
<td>8.0%</td>
</tr>
<tr>
<td>March 31, 2019</td>
<td>12.4%</td>
<td>16.0%</td>
<td>9.0%</td>
<td>8.9%</td>
</tr>
</tbody>
</table>
U.S. Equity Market Over the 10-Year Period

<table>
<thead>
<tr>
<th>Year</th>
<th>S&amp;P 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>26.5%</td>
</tr>
<tr>
<td>2010</td>
<td>15.1%</td>
</tr>
<tr>
<td>2011</td>
<td>2.1%</td>
</tr>
<tr>
<td>2012</td>
<td>16.0%</td>
</tr>
<tr>
<td>2013</td>
<td>32.4%</td>
</tr>
<tr>
<td>2014</td>
<td>13.7%</td>
</tr>
<tr>
<td>2015</td>
<td>1.4%</td>
</tr>
<tr>
<td>2016</td>
<td>12.0%</td>
</tr>
<tr>
<td>2017</td>
<td>21.8%</td>
</tr>
<tr>
<td>2018</td>
<td>-4.4%</td>
</tr>
</tbody>
</table>

343%
U.S. Bond Yields and Returns Last 10 Years

<table>
<thead>
<tr>
<th>Year</th>
<th>Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>5.9%</td>
</tr>
<tr>
<td>2010</td>
<td>6.5%</td>
</tr>
<tr>
<td>2011</td>
<td>7.8%</td>
</tr>
<tr>
<td>2012</td>
<td>4.2%</td>
</tr>
<tr>
<td>2013</td>
<td>-2.0%</td>
</tr>
<tr>
<td>2014</td>
<td>6.0%</td>
</tr>
<tr>
<td>2015</td>
<td>0.6%</td>
</tr>
<tr>
<td>2016</td>
<td>2.6%</td>
</tr>
<tr>
<td>2017</td>
<td>3.5%</td>
</tr>
<tr>
<td>2018</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
Real Estate Market (2010—2018)

NCREIF Property Index

<table>
<thead>
<tr>
<th>Year</th>
<th>Appreciation</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>2011</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>2012</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>2013</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>2014</td>
<td>0%</td>
<td>-5%</td>
</tr>
<tr>
<td>2015</td>
<td>-5%</td>
<td>-10%</td>
</tr>
<tr>
<td>2016</td>
<td>-10%</td>
<td>-15%</td>
</tr>
<tr>
<td>2017</td>
<td>-15%</td>
<td>-20%</td>
</tr>
<tr>
<td>2018</td>
<td>-20%</td>
<td>-25%</td>
</tr>
</tbody>
</table>
Historical Optimal Portfolio

➢ Overweight U.S. Large Cap Stocks

➢ Protection and consistency in U.S. Bond Market

➢ Solid income and appreciation in the U.S. Real Estate market
# U.S. Portfolio vs. Global Portfolio

<table>
<thead>
<tr>
<th>U.S. Portfolio</th>
<th>Asset Class</th>
<th>Proxy</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U.S. Equity</td>
<td>S&amp;P 500</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>Core Fixed Income</td>
<td>Bloom/Barc US AGG</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Direct Real Estate</td>
<td>NCREIF Property</td>
<td>10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Global Portfolio</th>
<th>Asset Class</th>
<th>Proxy</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Global Equity</td>
<td>MSCI ACWI</td>
<td>42%</td>
</tr>
<tr>
<td></td>
<td>Global Fixed Income</td>
<td>Bloom/Barc Global Agg</td>
<td>28%</td>
</tr>
<tr>
<td></td>
<td>Direct Real Estate</td>
<td>NCREIF Property</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>Private Equity</td>
<td>CA Buyout Index</td>
<td>7.5%</td>
</tr>
<tr>
<td></td>
<td>Hedge Funds</td>
<td>HFRX Global</td>
<td>7.5%</td>
</tr>
</tbody>
</table>
Results: 2010 – 2018

Return Risk

<table>
<thead>
<tr>
<th></th>
<th>U.S. Portfolio</th>
<th>Global Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annualized Arithmetic Average Return</td>
<td>10.52%</td>
<td>7.94%</td>
</tr>
<tr>
<td>Annualized Standard Deviation</td>
<td>6.86%</td>
<td>6.24%</td>
</tr>
<tr>
<td>Annualized Compound Return</td>
<td>10.27%</td>
<td>7.74%</td>
</tr>
</tbody>
</table>

Source: MSCI, SMA

Performance period: January 1, 2010 – December 31, 2018
Results: 2000 – 2009

Return Risk

Source: MSCI, SMA

Overall, Global portfolios and U.S. portfolios performed comparably, over the past 20 years, entering 2019.

However, while their paths were directionally similar, the absolute paths were different.

Source: MSCI, SMA.
Zone Status – Multiemployer Calendar Year Plans

Red Zone
- Spring 2008, 7%
- Spring 2009, 32%
- Spring 2019, 25%

Yellow Zone
- Spring 2008, 10%
- Spring 2009, 29%
- Spring 2019, 10%

Green Zone
- Spring 2008, 83%
- Spring 2009, 39%
- Spring 2019, 65%
Zone Status – Calendar Year Plans By Industry

Construction (104 plans)
- Red Zone Non-C&D: 12%
- Red Zone C&D: 2%
- Yellow Zone: 11%
- Green: 75%

Entertainment (7 plans)
- Red Zone Non-C&D: 14%
- Red Zone C&D: 14%
- Yellow Zone: 72%

Manufacturing (14 plans)
- Red Zone Non-C&D: 7%
- Red Zone C&D: 43%
- Yellow Zone: 50%

Retail Trade & Food (9 plans)
- Red Zone Non-C&D: 33%
- Red Zone C&D: 11%
- Yellow Zone: 11%
- Green: 45%

Service (25 plans)
- Red Zone Non-C&D: 32%
- Red Zone C&D: 8%
- Yellow Zone: 60%

Transportation (36 plans)
- Red Zone Non-C&D: 8%
- Red Zone C&D: 25%
- Yellow Zone: 17%
- Green: 50%
State Retirement Systems Funding Level

Pension Fund Investing

➢ Overall
• More transparency – banks taking less risk
• Rise of alternative lenders – shadow banking
• Less liquidity – banks less willing to use balance sheet for support
• Increase in compliance and oversight
• Changes to money market regulation and securities lending risk management

➢ Governance
• More de-risking and ultra-“risk” awareness
• Increased interest in outsourcing and discretionary solutions
• Greater attention in reducing actuarial assumption rates
• More legal and due diligence scrutiny
Portfolio Structure

- Return on capital vs. return of capital
- Lower yield environment led to more diversified fixed income portfolios
- Lack of downside protection led to more passive management in equities
- Focus on lower investment management fees
- Avoid complexity led to less interest in hedge fund investing
- Increased use of private markets
- Growth of Below Investment Grade Bond Market
- Search for more risk controls – opportunistic, MACS
- Alternative source of financing – private debt
- Cash flow management
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Consumer Confidence Rebounded

USA Consumer Confidence

Monthly Average
7/31/2000 – 2/28/09 = 94.7

2/28/09 level: 25.3

Source: Conference Board, Factset
Consumer Balance Sheet Deleveraged

Source: FRED, Federal Reserve
Fixed Income Environment

Central Bank Target Rates

9 rate increases since December 2015

Source: FactSet
<table>
<thead>
<tr>
<th>Central Bank</th>
<th>Rate</th>
<th>Last Change</th>
<th>Direction of Last Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Fed</td>
<td>2.50%</td>
<td>12/19/18</td>
<td>▲</td>
</tr>
<tr>
<td>Royal of Australia</td>
<td>1.25%</td>
<td>6/5/19</td>
<td>▼</td>
</tr>
<tr>
<td>Bank of England</td>
<td>0.75%</td>
<td>8/2/18</td>
<td>▲</td>
</tr>
<tr>
<td>Bank of Canada</td>
<td>1.75%</td>
<td>10/24/18</td>
<td>▲</td>
</tr>
<tr>
<td>European Central Bank</td>
<td>0.00%</td>
<td>3/10/16</td>
<td>▼</td>
</tr>
<tr>
<td>Bank of Japan</td>
<td>-0.10%</td>
<td>2/1/16</td>
<td>▼</td>
</tr>
<tr>
<td>Peoples Bank of China</td>
<td>4.35%</td>
<td>10/23/15</td>
<td>▼</td>
</tr>
</tbody>
</table>
Global Debt Continues to Grow

Global Debt Outstanding ($T)

- Households
- Nonfinancial corporates
- Government

Total Debt to GDP (%)

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<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Total Debt</td>
<td>188</td>
<td>167</td>
<td>164</td>
<td>183</td>
<td>177</td>
<td>180</td>
<td>187</td>
<td>209</td>
<td>218</td>
<td>221</td>
<td>216</td>
</tr>
</tbody>
</table>

Source: Bank for International Settlements; McKinsey Global Institute
Slower GDP Growth Worldwide

Canada
2017: 3.0%
2019: 1.9%

United States
2017: 2.2%
2019: 2.5%

United Kingdom
2017: 1.8%
2019: 1.5%

Latin America
2017: 1.3%
2019: 2.0%

Eurozone
2017: 2.4%
2019: 1.6%

China
2017: 6.9%
2019: 6.2%

Japan
2017: 1.9%
2019: 1.1%

2019 World Economic Outlook with projections 2019
<table>
<thead>
<tr>
<th>Asset Class</th>
<th>2006 Assumptions</th>
<th>2019 Assumptions</th>
<th>2006-2019 (Difference)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard</td>
<td>Geometric</td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td>Deviation (Risk)</td>
<td>Return</td>
<td>Deviation (Risk)</td>
</tr>
<tr>
<td>Cash</td>
<td>2.8%</td>
<td>4.3%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Core US Fixed Income</td>
<td>8.5%</td>
<td>5.0%</td>
<td>5.5%</td>
</tr>
<tr>
<td>US Inflation Linked Bonds</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Dev Mkt. Non-US FI</td>
<td>9.5%</td>
<td>4.8%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>9.5%</td>
<td>7.3%</td>
<td>11.8%</td>
</tr>
<tr>
<td>High Yield</td>
<td>13.0%</td>
<td>5.9%</td>
<td>10.0%</td>
</tr>
<tr>
<td>REITs</td>
<td>13.0%</td>
<td>7.1%</td>
<td>17.5%</td>
</tr>
<tr>
<td>Broad US Equity</td>
<td>18.5%</td>
<td>7.9%</td>
<td>17.5%</td>
</tr>
<tr>
<td>Dev Mkt. Non-US Eq.</td>
<td>22.5%</td>
<td>7.9%</td>
<td>19.0%</td>
</tr>
<tr>
<td>Emerging Mkt Debt</td>
<td>19.4%</td>
<td>7.0%</td>
<td>11.0%</td>
</tr>
<tr>
<td>Emerging Mkt Equity</td>
<td>33.5%</td>
<td>9.5%</td>
<td>24.0%</td>
</tr>
<tr>
<td>Private Equity</td>
<td>35.0%</td>
<td>10.6%</td>
<td>22.5%</td>
</tr>
</tbody>
</table>
➢ Volatility is in, and can be our friend
➢ Lower return environment
➢ Fixed income looks more like “fixed” income
➢ Equities still command a long term risk premium vs. fixed income
➢ Equities challenged to be “kicker” that we are familiar with historically
➢ The longer term emerging markets growth story is relevant for both equities and fixed income
➢ Alternatives can provide long term, uncorrelated sources of alpha, especially for those investors who can govern nimbly
➢ Real estate and hard assets can still play a role as diversifiers, and/or return enhancers for certain client specific objectives