IMPLICATIONS OF A FLATTENING YIELD CURVE

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UNPRECEDENTED ACCELERATION

RECORD 9 CONSECUTIVE QUARTERS OF YEAR-OVER-YEAR GROWTH ACCELERATING; 2.9% GROWTH FOR FULL-YEAR 2018

Gross Domestic Product (QoQ, SAAR)
Gross Domestic Product (YoY)

Sources: BEA, Vining Sparks
RISKS TO STABILITY INCREASING

GROWING LIST OF FACTORS EXPECTED TO WEIGH ON GROWTH AND INCREASE THE RISKS TO RECESSION

STABLE GROWTH, GROWING RISKS

- Trade Policy
- Fiscal Policy
  - 2020 Fiscal Cliff
  - Limitations on Future Fiscal Stimulus
- Monetary Policy and Interest Rates
  - Lagged Impact of Monetary Tightening
  - Monetary Policy Closer to “Neutral”, Possibly Already Restrictive
- Global Headwinds
  - Net Quantitative Tightening
  - Growth of Global Debt
  - Slowing Global Economic Growth
FED POLICY – CLOSER TO NEUTRAL

MARKET SIGNALS – MARKET TEMORS HAVE ILLUSTRATED THE HEIGHTENED FRAGILITY IN TODAY’S ENVIRONMENT

Sources: S&P 500 Index, Vining Sparks
The Federal Reserve

- Created by Congress in 1913 under the Federal Reserve Act
- “To provide the nation with a safer, more flexible, and more stable monetary and financial system”
- Supervise and regulate banks and other financial institutions
- Contain systemic risk to maintain stability of financial system
- Operate and oversee the nation’s payment systems
- Conduct nation’s monetary policy in pursuit of a dual mandate: Maximum Employment and Stable Prices
ACCOMPLISHING MAXIMUM EMPLOYMENT WHILE KEEPING INFLATION STABLE IS A CONSTANT BALANCING ACT

Unemployment Rate

Average Hourly Earnings (YoY)

Sources: BLS, Vining Sparks
EMPLOYMENT AND STABLE PRICES

AS THE LABOR MARKET IMPROVES, WAGES RISE AND PUSH INFLATION HIGHER

Sources: BLS, Vining Sparks
POLICY TOOLKIT

DISCOUNT RATE - Interest rate on short-term loans for commercial banks

OPEN MARKET OPERATIONS - Buying or selling securities in the market to affect interest rates

RESERVE REQUIREMENTS - Can raise or lower bank reserve requirements to add or subtract money from the banking system

INTEREST ON RESERVES - Can pay interest, or not, on banks’ excessive reserves

COMMUNICATIONS - Informing markets of future policy expectations through varying modes of communication

THE FED GENERALLY RAISES OR LOWERS SHORT-TERM INTEREST RATES AND AFFECTS FUNDS IN BANKING SYSTEM

STABLE GROWTH, GROWING RISKS

FED 101

IMPLIEDS OF A FLAT YIELD CURVE

FED'S POLICY RESPONSE

SUMMARY AND PROJECTIONS
VOTING MEMBERS ROTATE ANNUALLY ON THE FOMC, THE OFFICIAL BODY TASKED WITH MAKING POLICY DECISIONS

7 Fed Reserve Governors (including Chair)
+ NY Fed Bank President (always a voter)
+ 4 Regional Fed Bank Presidents (rotate annually)

= The FOMC

8 Annual Meetings

Statement - Same Day Minutes - 3-Week Delay

Economic Projections 4x per Year

Sources: Federal Reserve, Vining Sparks
FOMC MONETARY POLICY

AS THE ECONOMY HEATS UP, THE FED RAISES SHORT-TERM RATES AND VICE VERSA WHEN GROWTH SLOWS

Nominal GDP Growth (YoY)

Fed Funds Rate

Sources: BEA, Federal Reserve, Vining Sparks
CHANGES IN MONETARY POLICY HAVE HISTORICALLY HAD A 12- TO 24-MONTH LAGGED EFFECT ON ECONOMIC ACTIVITY

Sources: Federal Reserve, BEA, Bloomberg, Vining Sparks
The 9 rate hikes since 2015 have pushed the Fed Funds rate closer to neutral estimates.

**Fed’s Median Estimate of Longer Run Neutral Fed Funds Rate**

**Neutral Estimate Range**
- 2.50% to 3.50%

**Neutral Estimate Central Tendency**
- 2.50% to 3.00%

**Fed Funds Target Range and Midpoint**

Sources: Bloomberg, Federal Reserve December SEP, Vining Sparks
THE SHAPE OF THE YIELD CURVE IS INFORMATIVE OF WHERE IN THE CYCLE THE ECONOMY IS

- Early Cycle (Steep Curve)
- Early-Mid Cycle (Normal Curve)
- Late-Mid Cycle (Flat Curve)
- Late Cycle (Inverted Curve)

2y10y Slope
3m10y Slope
3m30y Slope

Source: Vining Sparks
#4 YIELD CURVE TENDS TO INVERT BEFORE THE ECONOMIC DATA TURN LOWER

**Leading Eco Index (YoY)**

2s10s Spread

**Recession**

Sources: Conference Board, NBER, Bloomberg, Vining Sparks
## LESSONS FROM YIELD CURVE

#4 YIELD CURVE TENDS TO INVERT BEFORE THE ECONOMIC DATA TURN LOWER

### Leading Economic Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Signal for Recession</th>
<th>1989</th>
<th>2000</th>
<th>2006</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leading Indicator Index (YoY Change)</td>
<td>YoY Change Declines</td>
<td>+4.1%</td>
<td>+3.3%</td>
<td>+2.7%</td>
<td>+2.9%</td>
</tr>
<tr>
<td>Initial Jobless Claims (YoY Change)</td>
<td>YoY Change Declines for Consecutive Months</td>
<td>-8.1%</td>
<td>-2.4%</td>
<td>-4.1%</td>
<td>+0.2%</td>
</tr>
<tr>
<td>Weekly Hours Worked (Hours)</td>
<td>Hours Fall below 40.8</td>
<td>41.1</td>
<td>41.5</td>
<td>40.9</td>
<td>42.0</td>
</tr>
<tr>
<td>Consumer Confidence - Expectations (YoY)</td>
<td>YoY Change Declines</td>
<td>+5.4%</td>
<td>+2.3%</td>
<td>+1.6%</td>
<td>+1.1%</td>
</tr>
<tr>
<td>New Orders - Consumer Goods (YoY Change)</td>
<td>YoY Change Declines for 3+ Consecutive Months</td>
<td>+6.2%</td>
<td>-2.3%</td>
<td>+3.3%</td>
<td>+2.2%</td>
</tr>
<tr>
<td>Building Permits (YoY Change)</td>
<td>YoY Change Declines</td>
<td>+11.6%</td>
<td>-1.6%</td>
<td>+1.8%</td>
<td>+0.5%</td>
</tr>
<tr>
<td>New Orders - Core Capital Goods (YoY Change)</td>
<td>YoY Change Declines</td>
<td>+1.4%</td>
<td>+11.4%</td>
<td>+6.7%</td>
<td>+0.8%</td>
</tr>
<tr>
<td>ISM Manufacturing New Orders (Index)</td>
<td>Index Falls below 47.2</td>
<td>57.3</td>
<td>56.2</td>
<td>58.9</td>
<td>55.5</td>
</tr>
<tr>
<td>Stock Prices (YoY Change)</td>
<td>YoY Change Declines</td>
<td>+14.8%</td>
<td>+11.4%</td>
<td>+5.2%</td>
<td>-3.6%</td>
</tr>
</tbody>
</table>

### Yield Curve

<table>
<thead>
<tr>
<th>Index</th>
<th>Signal for Recession</th>
<th>1989</th>
<th>2000</th>
<th>2006</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Year / 10-Year Treasury (Spread)</td>
<td>Turns Negative</td>
<td>19Mos</td>
<td>13Mos</td>
<td>26Mos</td>
<td>0.17%</td>
</tr>
</tbody>
</table>

Sources: Conference Board, NBER, Bloomberg, Vining Sparks
LESSONS FROM YIELD CURVE

#7 ECONOMIC BACKDROP WHICH PUSHES FED TO HIKE THROUGH LONGER RATES INCLUDES FEAR OF RISING INFLATION

Sources: BLS, BEA, Bloomberg, Thomson Reuters, Vining Sparks

## 2s10s Yield Curve Inversions

<table>
<thead>
<tr>
<th>Labor</th>
<th>1989</th>
<th>2000</th>
<th>2006</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment Rate</td>
<td>5.3%</td>
<td>4.0%</td>
<td>5.0%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Year-over-Year Change in Unemployment Rate</td>
<td>-0.5%</td>
<td>-0.3%</td>
<td>-0.4%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Nonfarm Payroll Growth (6M Average)</td>
<td>276k</td>
<td>266k</td>
<td>218k</td>
<td>231k</td>
</tr>
<tr>
<td>Year-over-Year Change in Nonfarm Payroll Growth (6M Average)</td>
<td>+2k</td>
<td>+13k</td>
<td>+82k</td>
<td>+59k</td>
</tr>
</tbody>
</table>

## Inflation and Inputs

| PCE Inflation (Year-over-Year) | 4.2% | 2.2% | 2.9% | 1.9% |
| Year-over-Year Change in Core PCE Inflation | +0.5% | +1.2% | -0.1% | +0.3% |
| Wage Growth (Year-over-Year) | 3.3% | 3.6% | 2.9% | 3.2% |
| Year-over-Year Change in Wage Growth (YoY) | +0.3% | -0.2% | +0.5% | +0.4% |
| Oil Price (Year-over-Year) | -17% | +117% | +17% | -10% |
| Commodity Prices (Year-over-Year) | +8% | -3% | -3% | -8% |
| 10-Year TIPS Breakeven Inflation Rate | N/A | 2.4% | 2.4% | 2.0% |
| Year-over-Year Change in TIPS-Impaired Inflation Rate | N/A | +1.5% | Unch. | -0.2% |

## FOMC Concerns (As Described in Official Communications)

<table>
<thead>
<tr>
<th></th>
<th>N/A</th>
<th>Heightened inflation risk</th>
<th>Risks for faster inflation</th>
<th>Risks appear roughly balanced</th>
</tr>
</thead>
</table>

Sources: BLS, BEA, Bloomberg, Thomson Reuters, Vining Sparks
LESSONS FROM YIELD CURVE

ABSENT INFLATION RISKS, FED WILL HAVE OPPORTUNITY TO BE RESPONSIVE TO FINANCIAL CONDITIONS

IMPLICATIONS OF A FLAT YIELD CURVE

Most Accurate, Most Leading Indicator of Change in Economic Cycle
2yr/10yr and 3m/10yr Have Proven to Be Most Reliable Measures
Inverted Curve Can Be a False Flag
Curve Can Remain Flat for an Extended Period
Economic Data Tend to Look Strong When Yield Curve Inverts
Yields Are Likely Near the Cycle Peak Once Curve Inverts
Fed Tends to Continue Hiking after 2yr/10yr Inverts
Heightened Inflation Risk Has Accompanied Previous Curve Inversions
WHAT’S DIFFERENT THIS TIME

IN TODAY’S ENVIRONMENT, THE FED’S MOST ACUTE CONCERN IS NOT THE RISK OF HIGHER INFLATION

Core PCE Risk Assessment by FOMC Meeting Date

PCE Risks Broadly Balanced

PCE Risks to Upside

PCE Risks to Downside

Sources: Federal Reserve, Bloomberg, NBER, Vining Sparks
INFLATION NEAR TARGET

CONSUMER PRICE INFLATION IS NOW RUNNING NEAR 2% BUT IS NOT EXPECTED TO SHOOT MATERIALLY HIGHER

Core CPI Inflation (YoY)

Core PCE Inflation (YoY)

Sources: BLS, BEA, Vining Sparks
INFLATION EXPECTATIONS FELL IN THE 4TH QUARTER AS OIL PRICES DROPPED AND GLOBAL GROWTH CONCERNS GREW

Sources: Bloomberg, Vining Sparks
FED PROVING RESPONSIVE
FED COMPLETES POLICY REVERSAL FROM SEPTEMBER TO MARCH; DECIDEDLY DIFFERENT POSTURE GOING FORWARD

- GDP projections lowered
- Unemployment rate forecast raised
- NAIRU lowered to 4.3%
- March dot plot shows no rate hikes in 2019
- Policy projected to be restrictive - now marginally accommodative
- Likely moving to inflation averaging
- Treasury portfolio roll-off halved to $15 billion beginning May 1
- Overall portfolio roll-off to end after September 30
- First $20 billion in MBS roll-off reinvested into Treasurys

Sources: Federal Reserve, Vining Sparks
MARKET-BASED EXPECTATIONS FOR INTEREST RATES HAVE CHANGED MATERIALLY SINCE LATE-2018

1.875
2.125
2.375
2.625
2.875
3.125

As of November 2, 2018
Futures contracts were pricing in two, possibly three rate hikes in 2019

As of March 28, 2019
Futures contracts are now pricing in a rate cut in 2019

Sources: Bloomberg, Vining Sparks
SUMMARY

ECONOMY STABLE FOR NOW, MARKETS BEGIN QUESTIONING DURABILITY OF EXPANSION AMIDST GROWING HEADWINDS

TAILWINDS

- Strong U.S. Consumer
- Trade Deal Could Unleash Business Investment
- One More Year of Fiscal Boost
- Mild Inflation Likely to Persist

HEADWINDS / RISKS

- Tax-Cut Benefits Fade over Time
- Fiscal Boost to Fade
- Housing to Remain Sluggish
- Potential Trade Policy Misstep
- Fed Policy Error More Likely as Rates Near Neutral
- Assets Prices Still Appear High
- Slowing Global Growth
- Higher Global Debt Loads
- Aging U.S. Population

INTEREST RATES

- Slower Pace of Gradual (0-1 Hike)
- Likely Near Peak for Rate Cycle
# Economic and Interest Rate Projections

## Vining Sparks Projections

<table>
<thead>
<tr>
<th></th>
<th>Q119</th>
<th>Q219</th>
<th>Q319</th>
<th>Q419</th>
<th>Q120</th>
<th>Q220</th>
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<tbody>
<tr>
<td><strong>GDP (QoQ, SAAR)</strong></td>
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<td></td>
<td>1.5</td>
<td>2.8</td>
<td>2.3</td>
<td>2.3</td>
<td>1.0</td>
<td>1.9</td>
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<td><strong>Headline CPI (YoY)</strong></td>
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<td></td>
<td>2.1</td>
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<td>1.9</td>
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<td><strong>Core PCE (YoY)</strong></td>
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<td>1.9</td>
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<td>1.9</td>
<td>2.0</td>
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<td>1.9</td>
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<tr>
<td><strong>Unemployment Rate</strong></td>
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<td></td>
<td>3.8</td>
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<td>3.8</td>
<td>3.8</td>
<td>3.9</td>
<td>3.9</td>
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<td><strong>Nonfarm Payrolls (Monthly)</strong></td>
<td>175</td>
<td>155</td>
<td>155</td>
<td>150</td>
<td>140</td>
<td>130</td>
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<td><strong>Fed Funds Target</strong></td>
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<td>2.38</td>
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<td><strong>2-Year Treasury Yield</strong></td>
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<td></td>
<td>2.55</td>
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<tr>
<td><strong>10-Year Treasury Yield</strong></td>
<td>2.75</td>
<td>2.90</td>
<td>2.90</td>
<td>2.85</td>
<td>2.75</td>
<td>2.70</td>
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<td><strong>30-Year Treasury Yield</strong></td>
<td>2.82</td>
<td>3.00</td>
<td>2.98</td>
<td>2.92</td>
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<td><strong>Prime Rate</strong></td>
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<td><strong>30-Year Mortgage Rate</strong></td>
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<td>4.40</td>
<td>4.35</td>
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**March 2019**

Source: Vining Sparks February 2019 Economic Outlook Projections
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