A Global Recession: Key Indicators and Implications

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Michael Schwartz, Director of Commercial Strategy, Moody’s Analytics
About Moody’s Analytics

Moody’s
Leading global provider of credit rating opinions, insight and tools for credit risk measurement and management

Moody’s INVESTORS SERVICE
Independent provider of credit rating opinions and related information for over 100 years

Moody’s ANALYTICS
Models, data, software and research for financial risk analysis and related professional services
Cris deRitis

Cristian deRitis, Deputy Chief Economist at Moody’s Analytics, specializes in assessing the economy’s impact on household finance, housing, credit markets and public policy. Named on two U.S. patents for credit modeling, he created loss forecasting and stress testing systems for financial institutions. He joined Moody’s in 2008, after serving as a director with Fannie Mae. He also was an adjunct professor of economics at Johns Hopkins University.
Michael Schwartz

At Moody’s Analytics, Michael supports the commercial strategy group, working alongside risk-minded professionals to design and develop credit origination and risk measurement solutions. Prior to joining Moody’s Analytics, Michael served as customer success director for fintech startup Fundera, a marketplace created to pair small business owners with banks and alternative lenders. Michael also spent more than six years with PNC Bank, starting with the commercial underwriting group and then transitioning to the business bank segment, focusing on SBA commercial lending. Michael has a BS in finance with an economics minor from the University of Pittsburgh.
Agenda Slide

‣ Current State of the Global Economy

‣ Household Finances

‣ Recession Risk and Severity

‣ Best Practices to Manage Credit Risk
Recession Odds Rise, But Next 12 Months Unlikely

Probability of recession in 12 mo, %, using only financial and economic variables.

Source: Moody's Analytics
Consumers Driving Growth As Businesses Hold Back

Contributions to percent change in real GDP, % qtr/qtr annualized

Source: Moody’s Analytics
The Job Market Continues to Deliver

Millions

- Job Openings
- Unemployed (U3)
- Underemployed (U6)

Values As of Oct 2019:
- 11.5 mil
- 7.0 mil
- 5.9 mil

Sources: BLS, Moody’s Analytics
Regional Weaknesses Start to Emerge

Business cycle status as of August 2019 data

Source: Moody's Analytics
It’s All Up to Consumers; Overall Finances Healthy

As of 2019 Q3

**INCOME**

$16.5 T
Disposable Income
4.6% Growth Yr/Yr

**WEALTH**

$107 T
Net Worth
4.9% Growth Yr/Yr

**DEBT**

$15.2 T
Outstanding Debt
3.2% Growth Yr/Yr

Sources: Federal Reserve, Moody’s Analytics
...But Millennials Doing Worse Than Prior Generations

Median Net Worth of Households Under 35 Years Old, inflation-adjusted 2016 $

$20
$15
$10
$5
-

<table>
<thead>
<tr>
<th>Year</th>
<th>Median Net Worth</th>
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</thead>
<tbody>
<tr>
<td>1995</td>
<td>$20</td>
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<tr>
<td>1998</td>
<td>$15</td>
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<td>2001</td>
<td>$10</td>
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<td>2004</td>
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<td>2007</td>
<td>$5</td>
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<tr>
<td>2010</td>
<td>$5</td>
</tr>
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<td>2013</td>
<td>$5</td>
</tr>
<tr>
<td>2016</td>
<td>$5</td>
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</table>

Sources: Census Bureau, Moody's Analytics

Median Net Worth Down -40%
Hard and Soft Data Sends Mixed Signals

Sources: Conference Board, BEA, Moody’s Analytics
Global Recession Risks Are Rising

Circle size = Real GDP, USD, 2019Q3

Recovery

Expansion

Recession

Slowdown

Countries:
- Egypt
- Greece
- South Africa
- Brazil
- Russia
- Turkey
- Italy

Countries:
- Indonesia
- Saudi Arabia
- India
- Malaysia
- Australia
- Chile
- Vietnam
- Thailand

Countries:
- US
- China
- Japan
- Singapore
- UK
- France
- Canada
- South Korea
- Israel
- Spain
- Germany
- Saudi Arabia
- Australia
- Egypt
- Greece
- South Africa
- Brazil
- Russia
- Turkey
- Italy

Global Recession Risks Are Rising
What Could Go Wrong?

Source: Moody's Analytics

High Likelihood of Shock

- Manufacturing recession
- Inventory correction
- Decline in Commercial RE
- Subprime auto lending
- Sudden increase in inflation
- Consumer credit cycle
- Impeachment
- Student loans
- Midterm elections
- Powell removed
- Negative U.S. interest rates
- Shadow Banking disruption
- Fed policy mistake
- Escalation in trade war
- No Deal Brexit
- Liquidity crisis
- Leverage loan meltdown
- Stock market correction
- Labor market overheats
- Oil price shock
- Stock market correction

Economic Severity of Shock

Source: Moody’s Analytics
Effects Not Equal: Regional Casualties of the Trade War

% of GDP in industries impacted by Chinese retaliatory tariffs

Sources: BEA, Moody's Analytics
Fundamentals Suggest Next Recession Won’t Be Severe...

Recession Severity Index, composite of key indicators

Sources: Moody's Analytics
...But World of Negative Rates Untested

Global aggregate of negative-yielding debt, $ tril

Sources: Barclays, Bloomberg, Federal Reserve, Moody’s Analytics
Consider the Alternatives

Unemployment rate, %

Sources: BLS, Moody's Analytics

- Scenario 0 (4%ile)
- Scenario 1 (10%ile)
- Baseline (50%ile)
- Scenario 2 (75%ile)
- Scenario 3 (90%ile)
- Scenario 4 (96%ile)

- Oct UR 3.6%

- S4(96%)=7.9%
- S3(90%)=7.4%
- S2(75%)=4.7%
- BL(50%)=3.9%
- S1(10%)=3.4%
- S0(4%)=2.9%
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Type</th>
<th>Months to Recession</th>
<th>Threshold</th>
<th>Risk</th>
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<tbody>
<tr>
<td>Unemployment rate - NAIRU</td>
<td>Leading</td>
<td>30 to 36</td>
<td>0</td>
<td>High</td>
</tr>
<tr>
<td>Financial stress index</td>
<td>Leading</td>
<td>11 to 15</td>
<td>&gt;1</td>
<td>Low</td>
</tr>
<tr>
<td>Housing permits</td>
<td>Leading</td>
<td>10 to 12</td>
<td>Yr/Yr decline</td>
<td>Low</td>
</tr>
<tr>
<td>Yield curve 10-yr minus 3 mo</td>
<td>Leading</td>
<td>8 to 15</td>
<td>0</td>
<td>Moderate</td>
</tr>
<tr>
<td>Yield curve 10-yr minus 2-yr</td>
<td>Leading</td>
<td>8 to 14</td>
<td>0</td>
<td>Moderate</td>
</tr>
<tr>
<td>TED spread</td>
<td>Leading</td>
<td>7 to 8</td>
<td>&gt;100 basis points</td>
<td>Low</td>
</tr>
<tr>
<td>Consumer Confidence</td>
<td>Leading</td>
<td>5 to 10</td>
<td>30 point decline from peak</td>
<td>Low</td>
</tr>
<tr>
<td>Jobless claims</td>
<td>Leading</td>
<td>4 to 5</td>
<td>&gt;253k</td>
<td>Low</td>
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<tr>
<td>S&amp;P 500</td>
<td>Leading</td>
<td>3 to 9</td>
<td>20% correction</td>
<td>Low</td>
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<tr>
<td>ISM Manufacturing index</td>
<td>Leading</td>
<td>3 to 6</td>
<td>43.2</td>
<td>High</td>
</tr>
<tr>
<td>Net % of banks tightening lending standards on C&amp;I Loans</td>
<td>Leading</td>
<td>1 to 5</td>
<td>&gt;20%</td>
<td>Low</td>
</tr>
<tr>
<td>Hours worked for production workers</td>
<td>Leading</td>
<td>1 to 10</td>
<td>Yr/Yr decline</td>
<td>Moderate</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>Coincident</td>
<td>0</td>
<td>Increase of 0.25%</td>
<td>Low</td>
</tr>
<tr>
<td>Core capital goods orders</td>
<td>Coincident</td>
<td>0</td>
<td>Yr/Yr decline</td>
<td>Low</td>
</tr>
<tr>
<td>Industrial production</td>
<td>Coincident</td>
<td>0</td>
<td>Yr/Yr decline</td>
<td>Moderate</td>
</tr>
<tr>
<td>ISM nonmanufacturing index</td>
<td>Lagging</td>
<td>1</td>
<td>49</td>
<td>Low</td>
</tr>
<tr>
<td>Employment</td>
<td>Lagging</td>
<td>2 to 4</td>
<td>Yr/Yr decline</td>
<td>Low</td>
</tr>
<tr>
<td>Real GDP</td>
<td>Lagging</td>
<td>3 to 6</td>
<td>&lt; potential growth</td>
<td>Moderate</td>
</tr>
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</table>
Key Factors in Managing the Credit Lifecycle

- Technology
- Expertise
- Data
- Analytics
- Risk Models
Application via Credit Lifecycle Management Platform

Data Automation
- Seamless Integration to critical data sources
  - Private Firm Financial Data
  - IRS Data
  - Customer Information Portal
  - AI & Machine Learning

Loan Origination & Lifecycle Management Solution
- Customer Management
- Credit Analysis
- Credit Presentation
- Portfolio Risk Management
- Covenants/Monitoring
- Decisioning & Approvals

Credit Risk Solutions
- PD & LGD Profitability Calculations
- Deal Analytics
- Peer Analysis
Providing Consistent Risk Measures and Deal Analytics

- **Expected Default Frequency (EDF)**
  - Provides probability of default for private firms and public firms

- **Loss Default (LGD)**
  - Provides analysis of the EL, EAD, and LGD of the proposed deal

- **CRE Analysis**
  - Effectively structure your CRE deals

- **Risk Return**
  - Profitability and pricing tool of the deal
Early Warning Strategies for Tracking and Monitoring

Monitor financial ratios yielding early warning indicators

Credit Cycle Adjusted models begin showing differentiation vs. non-defaulters as early as 6 years prior to default

Leverage EXISTING data for portfolio reporting and monitoring
Creating a culture of risk awareness®

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