Managing in an Uncertain Economy

Brian Beaulieu
CEO & Chief Economist
**2018 Forecast Results**

If you heard ITR around two years prior...

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Duration</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>US GDP</td>
<td>24</td>
<td>99.9%</td>
</tr>
<tr>
<td>US Ind. Production</td>
<td>34</td>
<td>99.4%</td>
</tr>
<tr>
<td>Europe Ind. Production</td>
<td>24</td>
<td>99.2%</td>
</tr>
<tr>
<td>Canada Ind. Production</td>
<td>27</td>
<td>97.1%</td>
</tr>
<tr>
<td>China Ind. Production</td>
<td>30</td>
<td>99.9%</td>
</tr>
<tr>
<td>Retail Sales</td>
<td>28</td>
<td>99.6%</td>
</tr>
<tr>
<td>Housing (Single Family Units)</td>
<td>26</td>
<td>99.2%</td>
</tr>
<tr>
<td>Employment (Private Sector)</td>
<td>30</td>
<td>99.4%</td>
</tr>
</tbody>
</table>

*ITR Economics provides the best economic intelligence to reduce risk and drive practical and profitable business decisions.*
US Economy Bends and Grows
US Gross Domestic Product, SAAR, Chained 2012 $

3-Month Moving Average

Source: BEA
Back to a Normal Relationship

US Consumption of Crude Oil & Petroleum Products to Real Gross Domestic Product

Oil
Bils Barrels

GDP
Trils C2012$

Oil Consumption - Raw Data
GDP - 3MMA

Sources: EIA, BEA

Data Trends

First In Forecasts Worldwide
Rate-of-Change – A Management Tool
Global Issues

• Business Cycle
• Tariffs
Percent of 2018 World GDP by Country

- **United States**: 24.2%
- **China**: 15.8%
- **Rest of World**: 19.3%
- **United Kingdom (UK)**: 5.9%
- **Germany**: 4.7%
- **Japan**: 3.3%
- **India**: 3.3%
- **France**: 3.3%
- **Brazil**: 2.4%
- **Italy**: 2.2%
- **Russia**: 1.9%
- **Canada**: 1.9%
- **Spain**: 1.7%
- **Australia**: 1.7%
- **Mexico**: 1.6%
- **Sweden**: 1.5%
- **Iran**: 1.3%
- **South Korea**: 1.3%
- **Germany**: 1.0%
- **Netherland**: 0.9%
- **Turkey**: 0.9%
- **Switzerland**: 0.8%
- **Other countries**: 0.9%

*Total 2018 World GDP: $84.74 Trillion US*

Source: IMF, *73% are IMF Estimated Figures*
Trade is of Increasing Importance to Some Countries

World Industrial Production Index to G7 Leading Indicator

Sources: CPB Netherlands Bureau For Economic Policy Analysis, OECD
Global Demand Picks Up in 2020

US Crude Oil Futures Prices to World Industrial Production Index

Oil Prices

World IP

Sources: WSJ, CEIC

12/12 Rates of Change

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Financial Markets
Normal Growth Trend in Share Prices

S&P500 Stock Prices Index

Source: Wall Street Journal
Valuations Matter

Cyclically Adjusted Price Earnings Ratio: January 1900 - August 2019

Average 5-year Annualized Return on new $1 investment in the S&P 500

- 2.3% when CAPE ratio is ABOVE the purple line
- 11.3% when CAPE ratio is BELOW the grey line

Source: Robert Shiller – Yale University

Data source: Robert Shiller, Yale University, as of 8/7/2019
Analysis prepared by: Baird Family Wealth Group, The purple line is the 95th percentile. The grey is the 90th percentile.
New Research

US Stock Prices Index to ITR Financial Leading Indicator™

Stock Prices

Indicator

12/12

Monthly

3.6%

-7.6

Sources: Wall Street Journal, ITR Economics
Understand the Trade-Off Re: Yields

Interest Rates for Long-Term Government Bonds

Source: Trading Economics
US Mortgage Rate Are Heading Higher in the Next Cycle

US 30-Year Mortgage Rate

Source: Wall Street Journal
New Research Results for Bond Yields

US Government Long-Term Bond Yields to Emerging Markets Bond ETF

Sources: FRB, Yahoo Finance

12/12 Rates of Change
People

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Long Term: Think State Population Growth Rates

Source: US Census Bureau

Percent Change from Population Estimates 2010 to 2018
Incomes Are Rising
US Median Weekly Earnings (deflated)

Median Earnings - Raw Data

Source: BLS
In Search of More and More Labor

US Private Sector Employment

Private Sector Employment Growth: 1.9% C
Job Openings: 6.5 mils people, 11.3% C

Annual Data Trend
Source: BLS
Creative Destruction

North America Robotics Shipments Units to US Total Manufacturing Employment

Data Trends Thousands of Units, Millions of Employees

Sources: Robotic Industries Association, BLS
Leading Indicators
A Systems Approach
ITR’s Leading Indicator™ Says Problems Ahead

US Industrial Production to ITR Leading Indicator™

Reported in *ITR Trends Report – ITR Advisor*

Sources: FRB, ITR Economics
Collective L.I. System Projects Downward Trajectory For IP

US Industrial Production Index to Various Leading Indicators

Sources: FRB, ITR Economics, Institute for Supply Management, WSJ, IHS Markit
Capacity Utilization Signaling Weakening CAPEX

US Nondefense Capital Goods New Orders (excluding aircraft) to US Machinery Manufacturing Capacity Utilization Rate

New Orders

Utilization Rate

Sources: Census Bureau, FRB
Recent Collapse Says Further Weakness Ahead

US Total Retail Sales to ITR Retail Sales Leading Indicator™

Retail Sales

12/12 Monthly

Indicator has an 18-month lead time

Sources: ITR Economics, US Census Bureau
Leading the Traditional Leading Indicator

US Single-Unit Housing Starts to US Housing Unit Building Permits

Sources: US Census Bureau, NAHB
Housing: Early Signal of Rise

US Single Unit Housing Starts

0.859

Source: Census Bureau

Millions of Units

As seen in

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Market Specific Trends
More Rise Ahead; More Prosperity Ahead

US Crude Oil Production

Source: EIA

Millions of Barrels per Day

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Source: EIA
Canada is Open for Business

Canada Oil and Gas Extraction

Billions of 2007 Chained Canadian Dollars

Source: Statistics Canada
Mexico Is Still Not in the Game

Mexico Oil & Gas Mining Production

Source: Mexico National Institute of Statistics and Geography

2013 = 100
Making a Profit at These Prices in Aggregate

US Crude Oil Futures Prices

Source: WSJ

Data Trends, US $
Less of an Influence in the US Market

US Crude Oil Futures Prices to Saudi Arabia Crude Oil Production

Source: WSJ, EIA

Rate-of-change

-30
-20
-10
0
10
20
30

Price

-90
-60
-30
0
30
60
90

Production

'07 '08 '09 '10 '11 '12 '13 '14 '15 '16 '17 '18 '19 '20 '21

Price - 12/12
Production - 3/12

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Rates-of-change
Source: WSJ, EIA
Note the Inverted Scale: A Sign of Near-Term Weakness

US Crude Oil Futures Prices to Crude Oil Inventories Cushing, OK

Sources: WSJ, EIA

Rates-of-Change

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Rates-of-Change

Sources: WSJ, EIA
Soft Pricing Likely to Continue

US Natural Gas Futures

Data Trends in US $
Note the Inverted Scale: Storage Trend = Soft Pricing

US Natural Gas Future Prices to US Natural Gas Total Underground Storage

- Price - 12/12
- Index - 1/12

Sources: FRB, EIA

Rates-of-Change

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Recovery Trend Indicated for 2020

US Petroleum Refineries Production Index to US Crack Spread

Refineries Production

Index

'13 '14 '15 '16 '17 '18 '19 '20 '21 '22 '23

Refrineries Production - 12/12
Refrineries Production Forecast - 12/12
Index - Monthly

Source: FRB
“I do not mistrust the future. I do not fear what is ahead. For our problems are large, but our heart is larger. Our challenges are great, but our will is greater.”

-George H. W. Bush
Availability is a Huge Advantage Not to be Squandered

World Natural Gas Production by Region

There Is Some Good News

<table>
<thead>
<tr>
<th>Producers</th>
<th>bcm</th>
<th>% of World Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>760</td>
<td>20.2</td>
</tr>
<tr>
<td>Russia</td>
<td>694</td>
<td>18.4</td>
</tr>
<tr>
<td>Iran</td>
<td>214</td>
<td>5.7</td>
</tr>
<tr>
<td>Canada</td>
<td>184</td>
<td>4.9</td>
</tr>
<tr>
<td>Qatar</td>
<td>169</td>
<td>4.5</td>
</tr>
<tr>
<td>China</td>
<td>142</td>
<td>3.8</td>
</tr>
<tr>
<td>Norway</td>
<td>128</td>
<td>3.4</td>
</tr>
<tr>
<td>Australia</td>
<td>105</td>
<td>2.8</td>
</tr>
<tr>
<td>Algeria</td>
<td>94</td>
<td>2.5</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>94</td>
<td>2.5</td>
</tr>
<tr>
<td>Rest of World</td>
<td>1,184</td>
<td>31.3</td>
</tr>
</tbody>
</table>

Source: IEA

Billion Cubic Meters

First in Forecasts Since 1948
World Carbon Dioxide Emissions

- Asia & Oceania
- US
- Europe
- Africa
- Central & South America

Source: EIA

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Source: EIA
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