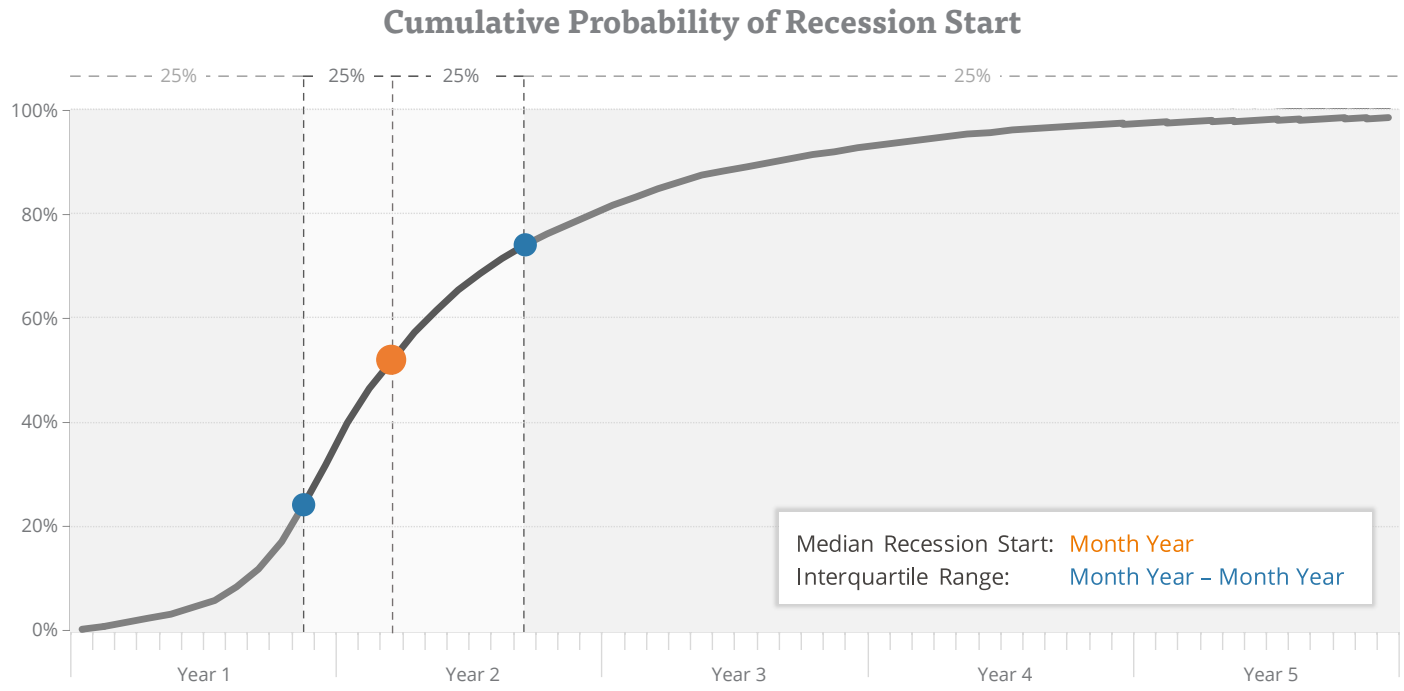
# When will the Next Recession Start?

We have the most reliable answer




## Exceptionally accurate forecasts of recession timing

| | | |
|---|---|---|
| Expected recession start date | Probability of recession at each month | Visibility for 24 months and beyond |
| Updated daily | 5-year forecast horizon | Online access via subscription |

**Economic recessions and expansions significantly impact the performance of businesses and investments. The question is not if, but when, the next recession will occur.**

© 2017 Intensity Corporation

INTENSITY

# Why

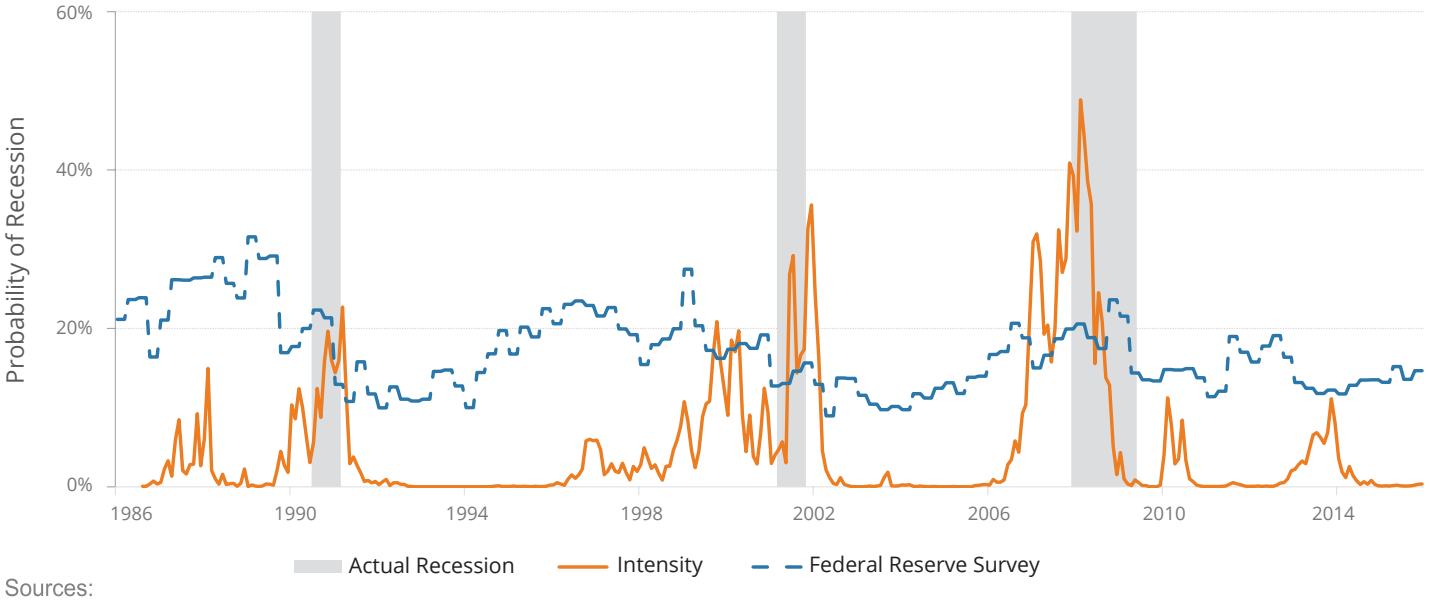
## Our reliable forecasts of recession timing improve critical decision making:

- Investment entry & exit
- Investment strategy
- Capital project timing
- Capital project magnitude
- Research & development
- Acquisitions & divestitures
- Business initiatives
- Commercial lending
- Residential lending
- Risk modeling

Intensity Business Cycle Forecasts are produced each day by our leading-edge forecasting machine that combines systematic methodology, pioneering techniques, and high-dimensional computation, which allow it to respond immediately to the most current economic conditions and events. In contrast, alternative approaches typically impose unreliable relationships among economic factors via inflexible models or the opinions of professional forecasters, who are susceptible to cognitive bias and unable to discern high-dimensional, time-varying relationships.

Intensity consistently outperforms other prominent recession forecasts. For example, we compare the Intensity Business Cycle Forecasts for the probability of a recession 12-months ahead to the Survey of Professional Forecasters, which also forecasts the probability of a decline in real gross domestic product (GDP). The graph below demonstrates that Intensity clearly outperformed the Survey of Professional Forecasters in predicting the timing of each of the past three U.S. recessions between 1987 and 2015.

### Forecast Comparison: 12 Months Ahead




Sources:
Intensity Corporation
Federal Reserve Bank of Philadelphia, Survey of Professional Forecasters

**Intensity Business Cycle Forecasts are the most accurate and reliable forecasts of recession timing available.**

© 2017 Intensity Corporation

# How

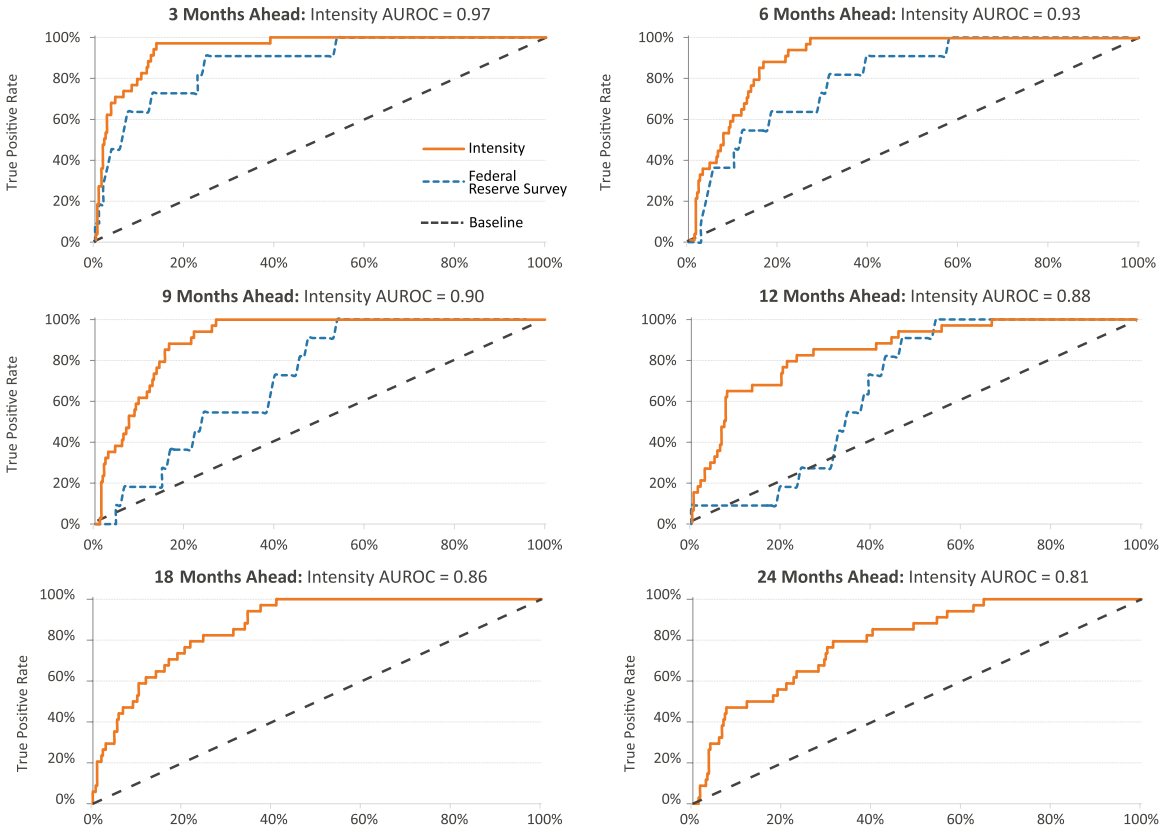
Intensity employs advanced quantitative methods and machine-learning techniques to deliver unparalleled forecast accuracy. Our team of renowned economists and data scientists have built a forecasting machine that selects impactful performance predictors, evaluates numerous modeling techniques, applies advanced simulation engines, and implements robust forecast aggregation. Intensity's machine-learning environment, together with a huge breadth of data sources, enable continual evolution and rapid response to changing conditions in the economy.

Intensity's cutting-edge scientific testing and validation methodologies ensure superior short and long-range out-of-sample forecast performance. We carefully correct for biases resulting from spurious correlation and data snooping. We measure the accuracy of our forecasts, quantify uncertainty, and ensure optimal forecast performance at each point in time.

One such approach is to examine out-of-sample accuracy by plotting receiver operating characteristic (ROC) curves. ROC curves display the true positive rate against the false positive rate for past out-of-sample forecasts. In other words, ROC curves convey how often a prediction of a recession is actually followed by a recession (i.e., true positive rate) in comparison to how often a prediction of a recession is not followed by a recession (i.e., false positive rate).

The ROC curves displayed in the graphs below demonstrate that Intensity's recession forecasts are highly accurate and feature powerful predictive performance even at longer forecast horizons. The true positive rate is well-above baseline for forecast horizons up through 24 months.

## ROC Curves for 3, 6, 9, 12, and 24-Month Horizons




Sources:
Intensity Corporation
Federal Reserve Bank of Philadelphia, Survey of Professional Forecasters

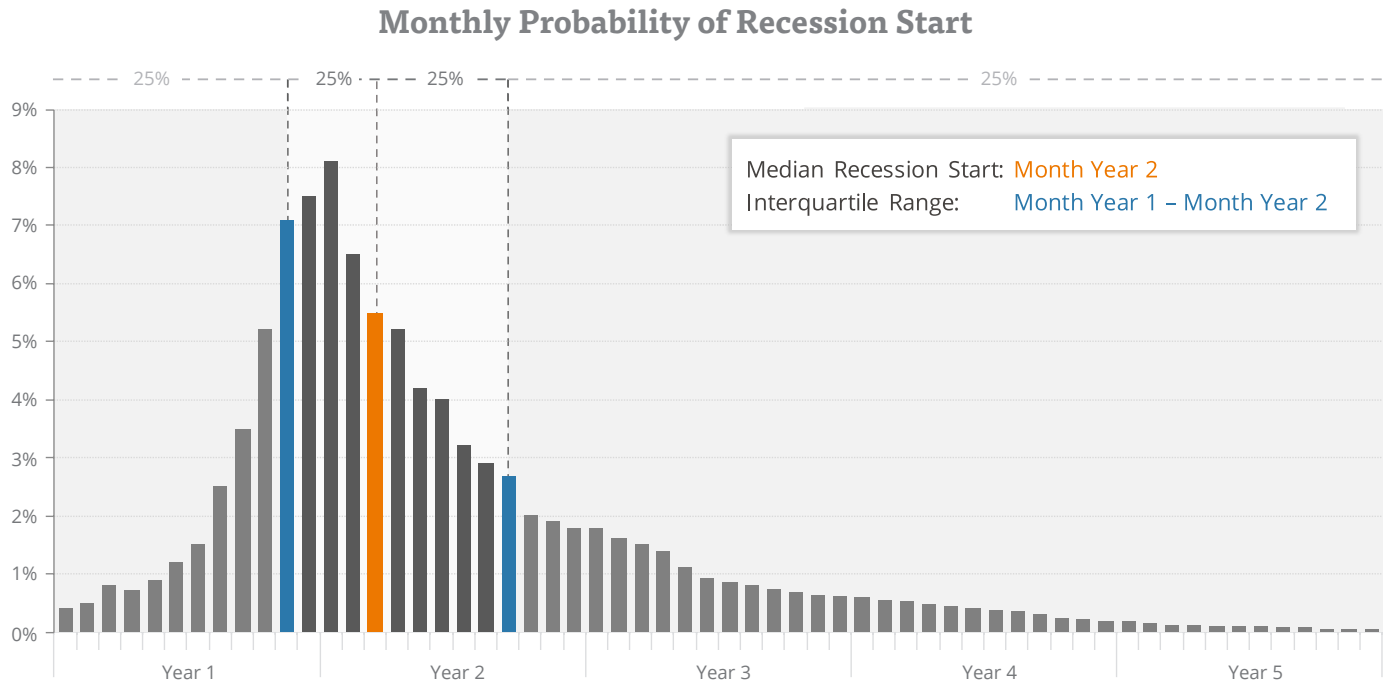
© 2017 Intensity Corporation

# What

Intensity provides a subscription-based web service that delivers exceptionally accurate forecasts of recession timing that are updated daily to reflect the latest developments in the economy and markets.

## Probability of recession

The probability of a recession starting in each month going forward from the current month up through 60 months. See the graph below.




## Expected recession start

The expected date of the next recession, as reflected by the median forecasted outcome. This is the date when there is a 50% probability of the next recession starting before, and a 50% probability of the next recession starting after.

## Interquartile range

The range of dates within which the next recession is most likely to begin. This is the range of dates for which there is a 25% probability of the next recession starting before, and a 25% probability of the next recession starting after. Thus, there is a 50% probability of the next recession starting within the interquartile range.

## 5-year horizon

Unparalleled visibility for each month throughout a 5-year period. While forecast performance naturally diminishes as the horizon increases, our machine delivers exceptional performance for 24 months and beyond. Advanced simulations provide meaningful forecasts of recession timing throughout the full 5-year horizon.

© 2017 Intensity Corporation

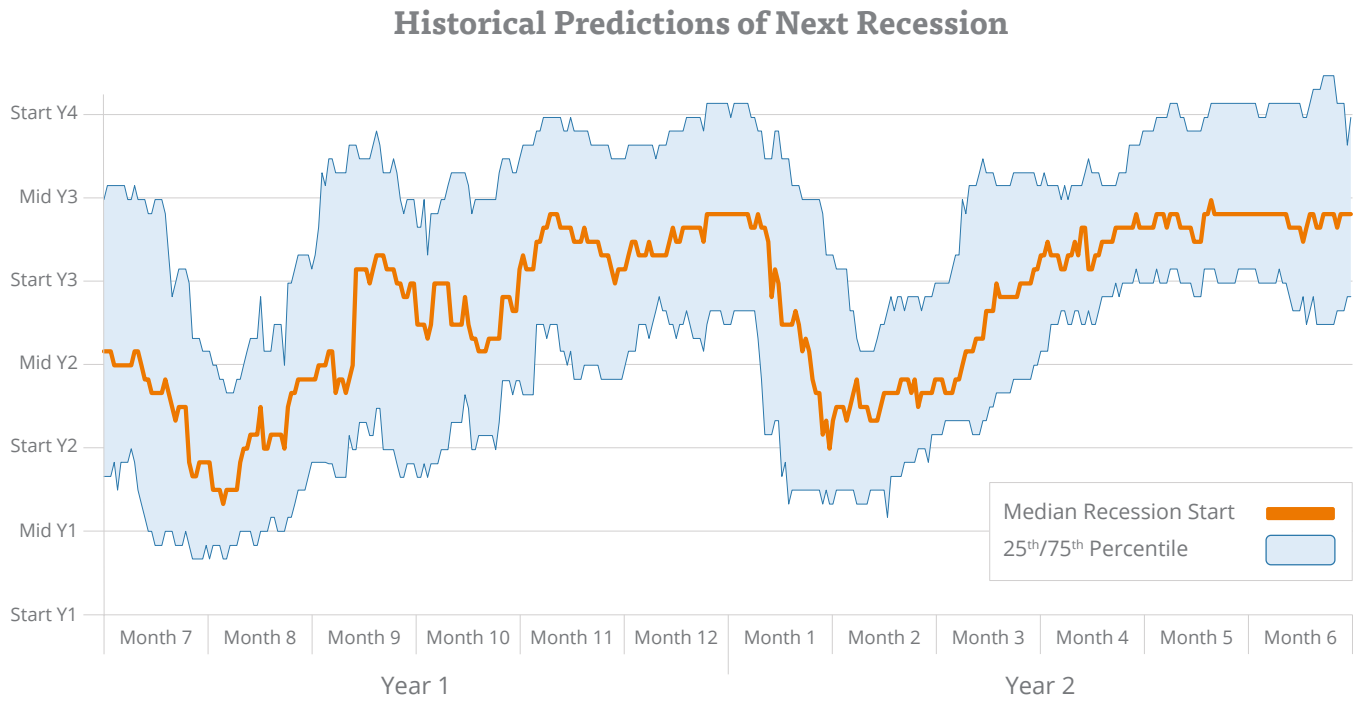
INTENSITY

## Daily updates

Developments in the economy and markets occur quickly and frequently. Our forecasting machine incorporates the latest information to deliver the most accurate and reliable forecasts at each point in time. Daily updates provide our clients with clarity in times of economic turmoil and tranquility.

## History of forecasts

One year of historical forecasts of the start of the next recession, shown as the likeliest recession start month, as well as the interquartile range of recession start months, provided for each day during the past year. This enables decision-makers to view current forecasts in the most insightful context to better understand how economic developments influence business cycles. See the chart for an illustration.




**In summary, Intensity Business Cycle Forecasts provide investors, business executives, organizational leaders, and analysts with unparalleled insights into the future of the U.S. business cycle to improve critical decision making.**

*The data and information herein are generalized for illustrative purposes only and do not reflect true data or technical implementation of methods.*

© 2017 Intensity Corporation

INTENSITY

# Who

**Our forecasts fully capture the expertise of our deeply skilled team, which includes world-renowned Ph.D. forecasting experts.**

**Ryan Sullivan, Ph.D.**

*Chief Executive Officer*

Ryan Sullivan, Ph.D. is Chief Executive Officer of Intensity and a leading expert in economics, finance, and statistics. He applies his expertise to solve the most complex and challenging issues that organizations face in the marketplace and the courtroom. Career highlights include:

- Nearly 25 years of professional economic consulting experience
- Established Quant Economics in 2006 and Intensity in 2014
- IAM Patent 1000 Top Economic Expert (2014, 2015, 2016, and 2017)
- Invited member of the University of California, San Diego (UCSD) Economics Leadership Council

---

**Allan Timmermann, Ph.D.**

*Senior Scientific Advisor*

Allan Timmermann, Ph.D. is an expert in financial markets, securities, economic forecasting, and statistics. Dr. Timmermann applies his expertise in data and econometric techniques to understand the behavior of prices and expectations in financial markets for managing risk, making portfolio decisions, and forecasting future price movements. Career highlights include:

- Chair, Model Validation Council, U.S. Federal Reserve Bank
- Professor of Finance, UCSD
- Co-director of UCSD Master of Finance Program
- More than 100 publications and book chapters

---

**Irina Telyukova, Ph.D.**

*Vice President*

Irina Telyukova, Ph.D. is a Vice President at Intensity and an expert in applied economics, finance, and predictive modeling. Dr. Telyukova has more than 15 years of experience in quantitative economic and financial research and consulting. Career highlights include:

- Economist at International Monetary Fund
- Assistant Professor of Economics and Quantitative methods, UCSD
- Assistant Economist at Federal Reserve Bank of New York
- Visiting positions at Federal Reserve Board and regional Feds

© 2017 Intensity Corporation

INTENSITY

**Our thought leaders are supported by an exceptional team of economists, statisticians, computational engineers, software developers, and business experts from top universities.**

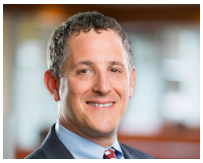

Ryan Sullivan


Allan Timmermann

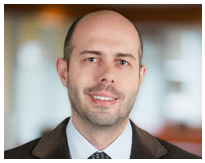

Irina Telyukova


Ray Bamford


On Amir


Brian Becker


John Gartman


Davide Pettenuzzo


Richard Brady


A. Subramaniam


Lanny Chiu


Zhewen Fan


Ajay Iyer


Aminta Raffalovich


Nathan Trujillo

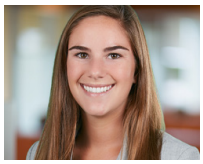

Daniel Brown

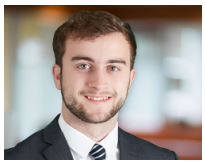

Jennifer Hulst

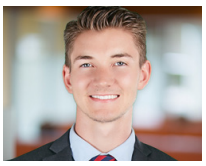

Jennifer Rosendin

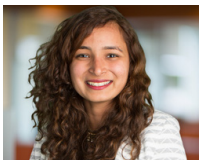

Laura Valera


Lauren Wilson


Kristyn Berretta

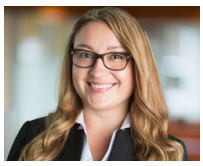

Matt Brundage


Robert Flanagan


Sanjana Shah


Alex Rassey


Daniel Watkins


Olga Yudina

© 2017 Intensity Corporation

INTENSITY

## About Intensity

Intensity generates excellence through powerful research, analysis, and expertise to solve the most complex challenges in the marketplace and courtroom. We consistently deliver reliable results that are built upon meticulous research, intense scrutiny, and scientific analysis.

**Please contact us any time!**

12730 High Bluff Drive Suite 300
San Diego, CA 92130
**858.876.9101**

intensity.com

© 2017 Intensity Corporation