

pulsenomics[®]
2017 CRYSTAL BALL AWARD WINNERS

In Recognition of Outstanding Performance in The Zillow[®] Home Price Expectations Survey

FIRST PLACE - OUTSTANDING PERFORMANCE			
Horizon	Year That Expectations Were Formulated	Panelist	Affiliation
5 Year (2013-2017)	2013	Jack Kleinhenz	Kleinhenz & Associates, Inc.
4 Year (2014-2017)	2013	Jack Kleinhenz	Kleinhenz & Associates
	2014	Joel Naroff	Naroff Economic Advisors
3 Year (2015-2017)	2013	Ingo Winzer	Local Market Monitor
	2014	Michael Englund	Action Economics
	2015	Rajeev Dhawan	Georgia State University
2 Year (2016-2017)	2013	Ingo Winzer	Local Market Monitor
	2014	Ingo Winzer	Local Market Monitor
	2015	Joel Naroff	Naroff Economic Advisors
	2016	Joel Naroff	Naroff Economic Advisors
1 Year (2017)	2017	Raymond Hodgdon	Enlightened Economics

OUTSTANDING CONSISTENCY			
<i>For the 11 performance categories:</i>			
Top-10 Rankings*	Top-5 Rankings	Panelist	Affiliation
10	8	Ingo Winzer**	Local Market Monitor
10	4	Jim Kleckley	East Carolina University
9	5	Michael Englund**	Action Economics
7	6	Joel Naroff**	Naroff Economic Advisors Inc
7	3	Don Rissmiller	Strategas Research Partners
5	3	Rajeev Dhawan**	Georgia State University
5	2	Peter Linneman	American Land Fund

*Includes the Top-5 ranking counts shown in the second column.

** First place winner

Ranking Eligibility

Panelists eligible for a 2017 ranking were those who participated in at least one of the four 2017 quarterly surveys AND in all four of the quarterly surveys that comprise a given year's set of expectations data (e.g., to be eligible for a 2017 award pertaining expectations made in 2015, a panelist would have had to submit forecast data for each of the four quarterly surveys that Pulsenomics conducted in 2015).

Ranking Methodology

The expectations data submitted by eligible panelists for each of the four survey editions in each calendar year were compared to the actual (Q4/Q4, or Dec/Dec) home price percentage changes for the five time horizons that ended in 2017:

Time Horizon	Expectations Vintage(s)
2017 (1 year horizon)	2017
2016-2017 (2 year horizon)	2013, 2014, 2015, 2016
2015-2017 (3 year horizon)	2013, 2014, 2015
2014-2017 (4 year horizon)	2013, 2014
2013-2017 (5 year horizon)	2013

Rankings are based on a comparison of each panelist's expectations for home price changes to the actual change as measured by the Zillow U.S. Home Value Index (the survey benchmark) using the index values published on January 18, 2018.

For each time horizon and expectations vintage, the sum of the absolute differences between (a) each of the four sets of quarterly expectations data submitted by eligible panelists in a calendar year and (b) the actual (Dec/Dec) percentage change in the applicable benchmark data was computed. These sums were then sorted in ascending order to generate rankings (i.e., the lowest sum represents the least average error/highest rank).