



Comparative Assessment of Fannie Mae's National Housing Survey[®]

July 2015





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Executive Summary

- The objective of this work is to understand how Fannie Mae's National Housing Survey (NHS) results compare to other major consumer tracking surveys (e.g. the University of Michigan Surveys of Consumers) on questions about the economy, personal finance and housing sentiments, to test the credibility of the NHS, and to identify where the NHS provides unique insights on consumer attitudes other surveys lack.
- We find that the NHS results generally align well with the other consumer surveys. For the 61 months comparison period, seven out of nine questions between the NHS and the other surveys had correlation coefficients of 0.75 or higher.
- We do observe some notable differences between the NHS and other surveys for some questions, both in large differences in absolute level of responses and low correlations. Some may be attributable to differences in question constructions. Such differences often mean additional insights rather than unwanted nuisance. Examples:
 - The NHS question on employment asks whether the respondent is concerned about losing his/her job in the next twelve months, while the Michigan survey asks whether unemployment in general will rise or fall. The distinctions between the two questions cause the average net response differs by more than 50 percentage point and the correlation is only 0.23.
 - Both the NHS and the Michigan survey asked about personal finance expectation, but NHS offers five response choices (much better/somewhat better/same/somewhat worse/worse) while the Michigan survey only offers three (better/same/worse). Possibly as a result of fewer response choices, the Michigan survey respondents report a higher percentage of "same" and a lower percentage of "better" than the NHS, some of those who choose "same" in the Michigan survey would seem to choose "somewhat better" if presented the choice.
- Statistical tests used provide additional details on how often and when the differences between the NHS and other surveys are significant. In some months, high differences are observed even for questions with high correlations that are considered generally equivalent. Potential causes could be differences in methodology, questions wording, and fielding timing.



Research Methodology

- A selected list of NHS questions¹ from June 2010² to June 2015 (61 months) were compared with similar questions from three major Consumer Surveys:
 - The University of Michigan Surveys of Consumers (Michigan)
 - The Conference Board Consumer Confidence Survey (Conference Board)
 - The Gallup U.S. Daily Survey (Gallup)
- For most of the questions, we computed the Net Positive Percentage³ as the basis for comparison
 - Net Positive Percentage = Percent Positive Response – Percent Negative Response
- To assess similarity and differences between responses to similar questions from NHS and Other Surveys, the following methods are used:
 - Time-series plots for visual comparisons of similarity in trends, levels, peaks and troughs etc.
 - Summary statistics including correlation coefficients, means, standard deviations etc., to further quantify the similarities and differences between the comparison questions
 - Two proportion z-tests to detect any statistically significant differences

1. See Appendix table 2 for complete list of questions compared

2. A few of the NHS questions didn't start until March, 2011

3. Net Positive Percentage = Percent Positive Responses – Percent Negative Responses, this is very similar to Net Promoter Score use widely in market research, with the advantage of simple (just one number) and easy to interpret (e.g. positive sign means overall positive attitude)



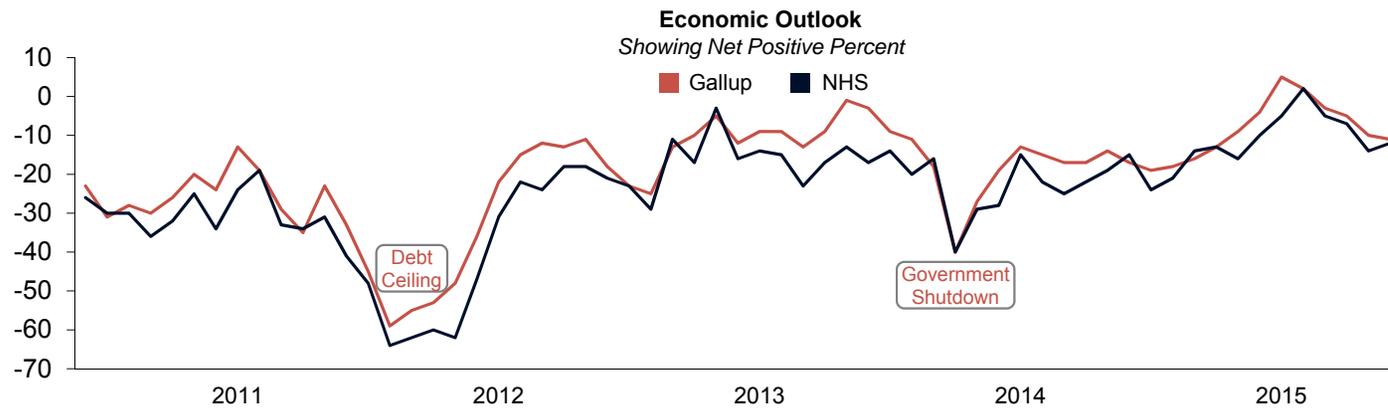
Results



Economic Outlook

NHS: In general do you think our economy is on the right track or is it off on the wrong track?

Gallup: Do you think that economic conditions in the country as a whole are getting better or getting worse?



Variable	Obs	Mean	Std. Dev.	Min	Max
NHS	61	-24.2	14.3	-64	2
Gallup	61	-19.2	13.6	-59	5

- Negative and volatile, reached positive briefly in Spring 2015 then turn negative again
- Very high correlation ($r=0.96$) between the two time series
- NHS on average is 5 points lower than Gallup, differences are statistically significant¹ at 95% confidence level in 35 out of 61 months (57%)

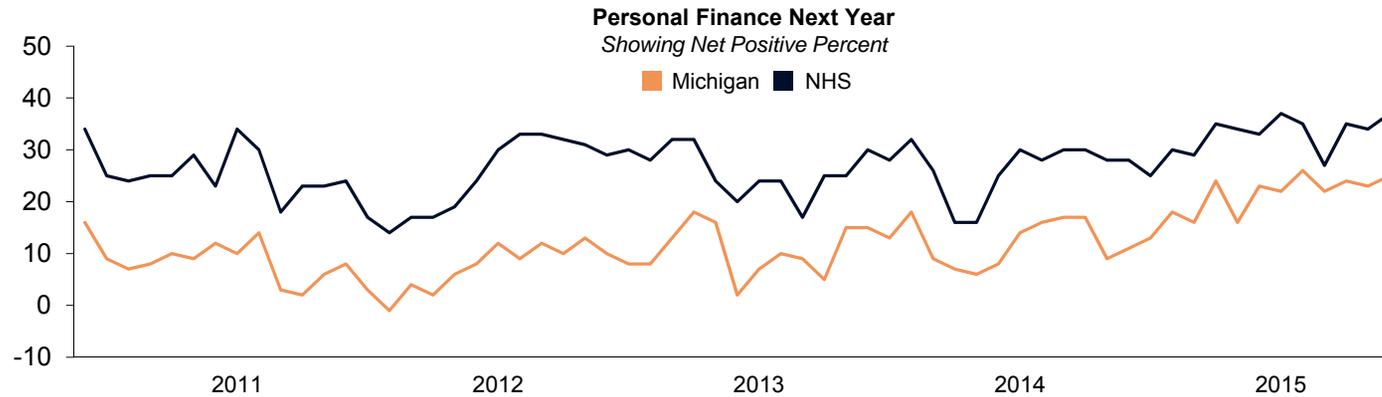
1. Based on two proportion z-test for percentages answering "right track (or getting better)", two tailed test, the NHS monthly sample size is 1,000, the Gallup survey monthly sample size is 15,000



Personal Finance Next Year

NHS: Looking ahead one year, do you expect your personal financial situation to get much better, somewhat better, stay about the same, get somewhat worse, or get much worse?

Michigan: Now looking ahead—do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?



Variable	Obs	Mean	Std. Dev.	Min	Max
NHS	61	27.1	5.8	14	37
Michigan	61	11.9	6.4	-1	26

- Both are positive and relatively flat, start trending up since Summer 2014
- High correlation ($r=0.78$) between the two time series
- NHS on average is 15 points higher¹ than Michigan, differences are statistically significant² at 95% confidence level in 60 out of 61 months

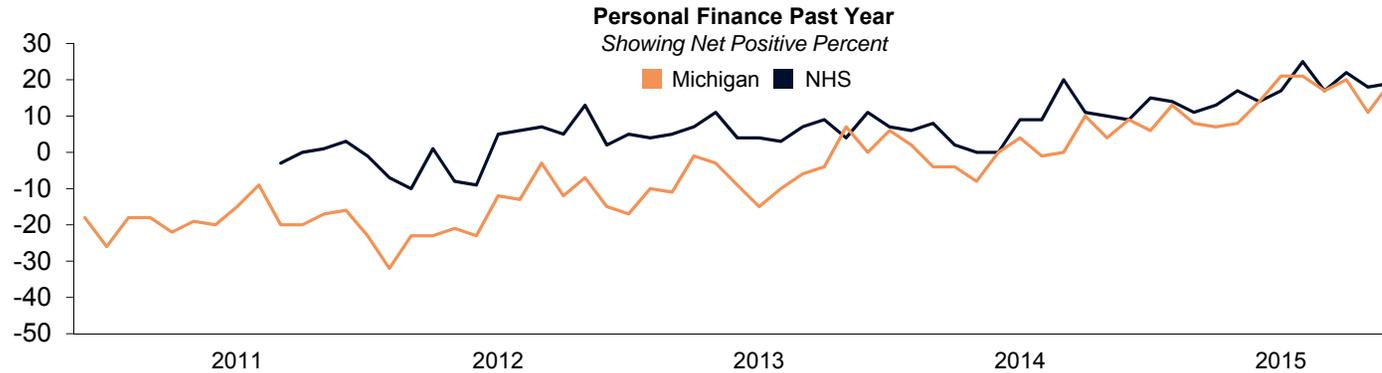
1. The Michigan survey has more people choose “same” than the NHS (54.4% vs 41%), and about the same choose “worse” (16% vs 15.6%), possibly due to less question choices than NHS
 2. Based on two proportion z-test for percentages answering “get better (or better off)”, two tailed test, NHS monthly sample size is 1,000, Michigan month sample size is 500



Personal Finance Past Year

NHS¹: Now looking back over the past year, has your personal financial situation gotten much better, somewhat better, stayed about the same, gotten somewhat worse, or gotten much worse?

Michigan: Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?



Variable	Obs ¹	Mean	Std. Dev.	Min	Max
NHS	52	7.2	7.8	-10	25
Michigan	52	-3.4	13.3	-32	21

- Both are trending up from negative to positive for the comparison period
- High correlation ($r=0.86$) between the two time series
- NHS on average is 10 points higher² than Michigan, differences are statistically significant³ at 95% confidence level in 17 out of 52 months (33%)

1. The NHS didn't start this question until March, 2011, comparisons are based on 52 months data only, we still plot data from June 2010 for consistency
 2. The Michigan survey didn't specify "same" as an option in question which may cause less people answer "same" (30% vs 54% in previous slide), this help push the two series closer than the previous personal finance question
 3. Based on two proportion z-test for percentages answering "get better (or better off)", two tailed test, NHS monthly sample size is 1,000, Michigan monthly sample size is 500

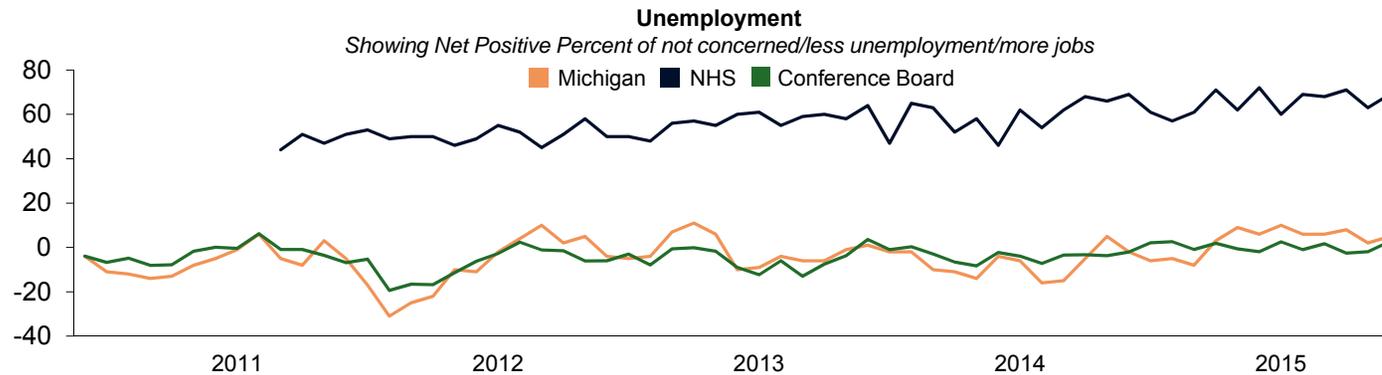


Unemployment

NHS¹: How concerned are you that you will lose your job in the next twelve months? Are you very concerned, somewhat concerned, not very concerned, or not at all concerned that you will lose your job in the next twelve months?

Michigan: How about people out of work during the coming 12 months--do you think that there will be more unemployment than now, about the same, or less?

Conference Board: Six months from now, do you think there will be [more/same/fewer] jobs available in your area?



Variable	Obs ¹	Mean	Std. Dev.	Min	Max
NHS	52	57.3	7.8	44	72
Michigan	52	-3.5	9.2	-31	11
Conference Board	52	-3.9	5.2	-19.4	3.6

- NHS is more positive and has stronger upward trend upward than the other two series, but it is also quite different in the question wording
- Positive but low correlations between NHS and Michigan ($r = 0.35$), and Conference Board ($r=0.36$)²

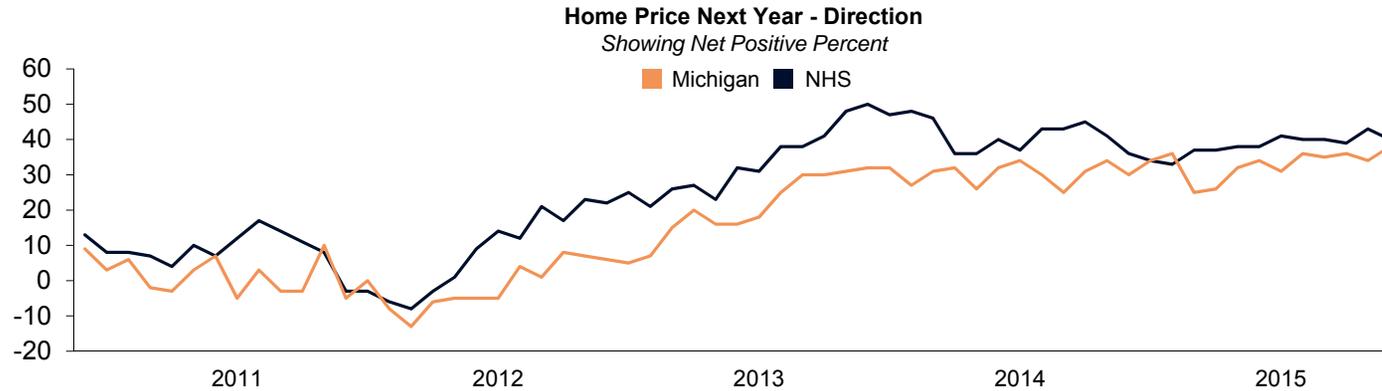
1. The NHS didn't start this question until March, 2011, comparisons are based on 52 months data only, we still plot data from June 2010 for consistency
 2. Correlation between Michigan and Conference Board is 0.73



Home Price

NHS: During the next 12 months, do you think home prices *in general* will go up, go down, or stay the same, as where they are now?

Michigan: What do you think will happen to the prices of homes (*like yours*) in your community over the next 12 months? Will they increase at a rapid rate, increase at a moderate rate, remain about the same, decrease at a moderate rate, or decrease at a rapid rate?



Variable	Obs	Mean	Std. Dev.	Min	Max
NHS	61	25.8	16.3	-8	50
Michigan	61	16.6	15.6	-13	38

- Both trending up from 2011-2013, then stay flat
- Very high correlation ($r=0.93$) between the two time series
- NHS on average is 9 points higher¹ than Michigan, differences are statistically significant² at 95% confidence level in 51 out of 61 months (84%)

1. The difference might partially due to the question construction – general vs your community

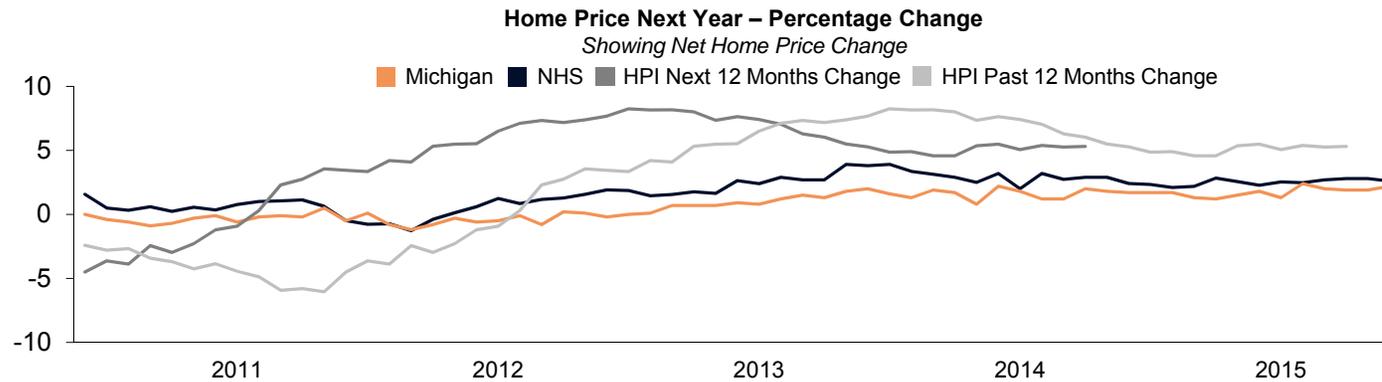
2. Based on two proportion z-test for percentages answering “go up (or increase)”, two tailed test, NHS monthly sample size is 1,000, Michigan monthly sample size is 500



Home Price – Continued

NHS: By about what percent do you think home prices *in general* will go down/up on the average over the next 12 months?

Michigan: By about what percent do you expect prices of homes *like yours in your community* to go (up/down), on average, over the next 12 months?



Variable	Obs	Mean	Std. Dev.	Min	Max
NHS	61	1.8	1.2	-1.3	3.9
Michigan	61	0.7	1.0	-1.2	2.4
HPI ¹ Next 12 Months	47	4.2	3.6	-4.5	8.2
HPI ¹ Past 12 Months	59	2.5	4.7	-6.0	8.2

- NHS estimates are higher than Michigan estimates, both are more attenuated than actual results
- High correlation ($r=0.88$) between the two time series, both are highly correlated with HPI past 12 month ($r > 0.8$) and both have much lower correlations with HPI next 12 months ($r < 0.4$)

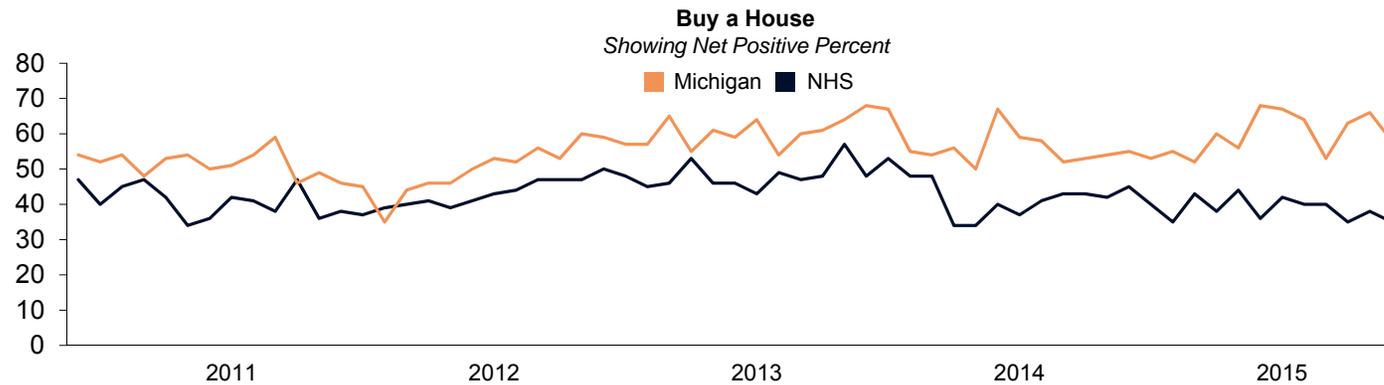
1. FHFA House Price Index – Purchase Only; data used here are HPI growth rates for the next 12 months (time series ends on April, 2014) and for the past 12 months (time series ends on April, 2015)



Buy a House

NHS: In general, do you think this is a very good time to buy a house, a somewhat good time, a somewhat bad time, or a very bad time to buy a house?

Michigan: Generally speaking, do you think now is a good time or a bad time to buy a house?



Variable	Obs	Mean	Std. Dev.	Min	Max
NHS	61	42.6	5.2	34	57
Michigan	61	55.6	6.7	35	68

- Both are highly positive yet flat for most of the comparison period, NHS seems to trend down in 2015
- Positive yet low correlation¹ ($r=0.22$) between the two time series
- NHS on average is 13 points Lower² than Michigan, differences are statistically significant³ at 95% confidence level in 49 out of 61 months (80%)

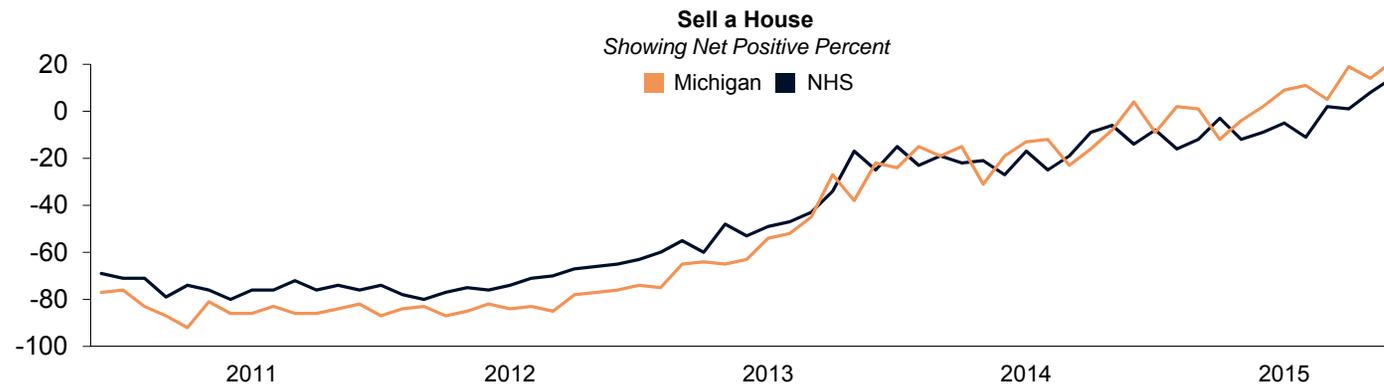
1. The flat nature of good time to buy, and the 6 months in 2014 when the two time series move in opposite directions are the possible reasons for low correlation
 2. Despite the high similarity of the question text in the two surveys, we still saw large differences, this may indicate the question is more subject to individual interpretation and therefore have large variations, 10 people may have 10 different reasons when saying "it is a good time to buy"
 3. Based on two proportion z-test for percentages answering "good time", two tailed test, NHS monthly sample size is 1,000, Michigan monthly sample size is 500



Sell a House

NHS: In general, do you think this is a very good time to sell a house, a somewhat good time, a somewhat bad time, or a very bad time to sell a house?

Michigan: What about selling a house—generally speaking, do you think now is a good time or bad time to sell a house?



Variable	Obs	Mean	Std. Dev.	Min	Max
NHS	61	-43.7	29.8	-80	14
Michigan	61	-46.8	37.2	-92	21

- Mostly negative but strong upward trend, turned positive in 2015
- Very high correlation ($r=0.98$) between the two time series
- NHS on average is 4 points Higher than Michigan, differences are statistically significant¹ at 95% confidence level in 30 out of 61 months (49%)

1. Based on two proportion z-test for percentages answering "good time", two tailed test, NHS monthly sample size is 1,000, Michigan monthly sample size is 500

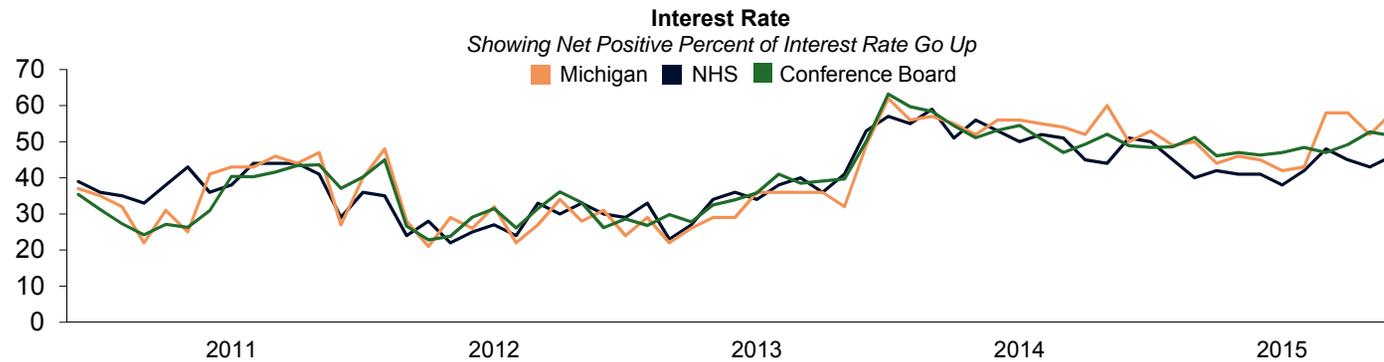


Interest Rate

NHS: During the next 12 months, do you think home mortgage interest rates will go up, go down, or stay the same as where they are now?

Michigan: No one can say for sure, but what do you think will happen to interest rates for borrowing money during the next 12 months--will they go up, stay the same, or go down?

Conference Board: What do you think will happen to interest rates [over the next 12 months]?



Variable	Obs	Mean	Std. Dev.	Min	Max
NHS	61	39.6	9.2	22	59
Michigan	61	40.8	11.9	21	62
Conference Board	61	40.5	10.5	23	63

- The three time series trend closely: $r(\text{NHS}, \text{Michigan}) = 0.86$, $r(\text{NHS}, \text{Conference Board}) = 0.86$
- differences are statistically significant¹ at 95% in 19 out of 61 months (31%) between the NHS and Michigan; and in 54 out of 61 months (88%) between the NHS and Conference Board

1. Based on two proportion z-test for percentages answering "interest going up", two tailed test, NHS monthly sample size is 1,000, Michigan monthly sample size is 500, Conference Board monthly sample size is 3000

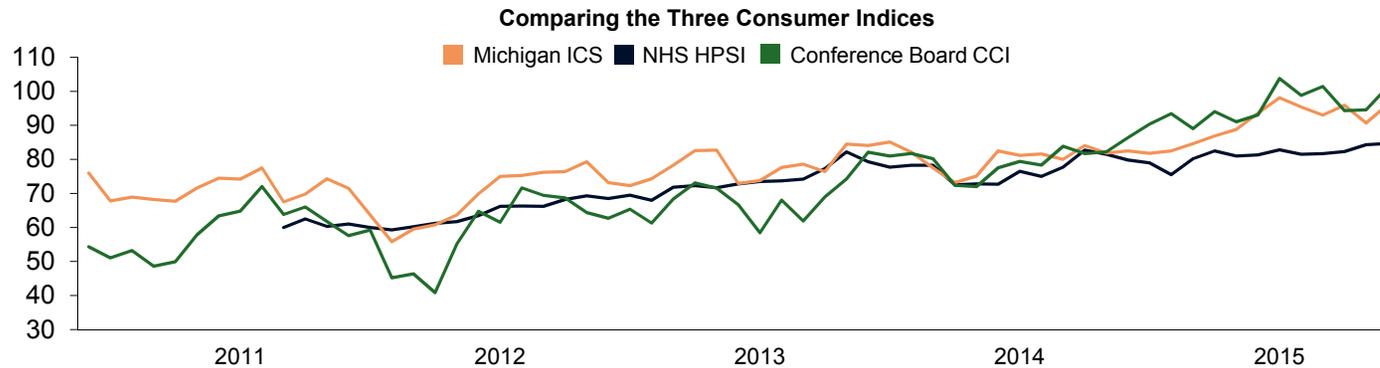


Three Consumer Indices

Fannie Mae Home Purchase Sentiment Index (HPSI): Averaging net positive percentages of six NHS questions on housing and personal finance

Michigan Index of Consumer Sentiment (ICS): Average of net positive percentages five questions on personal finance, business condition, and buying durable goods

Conference Board Consumer Confidence Index (CCI): Average of five questions on business condition, employment, and family income



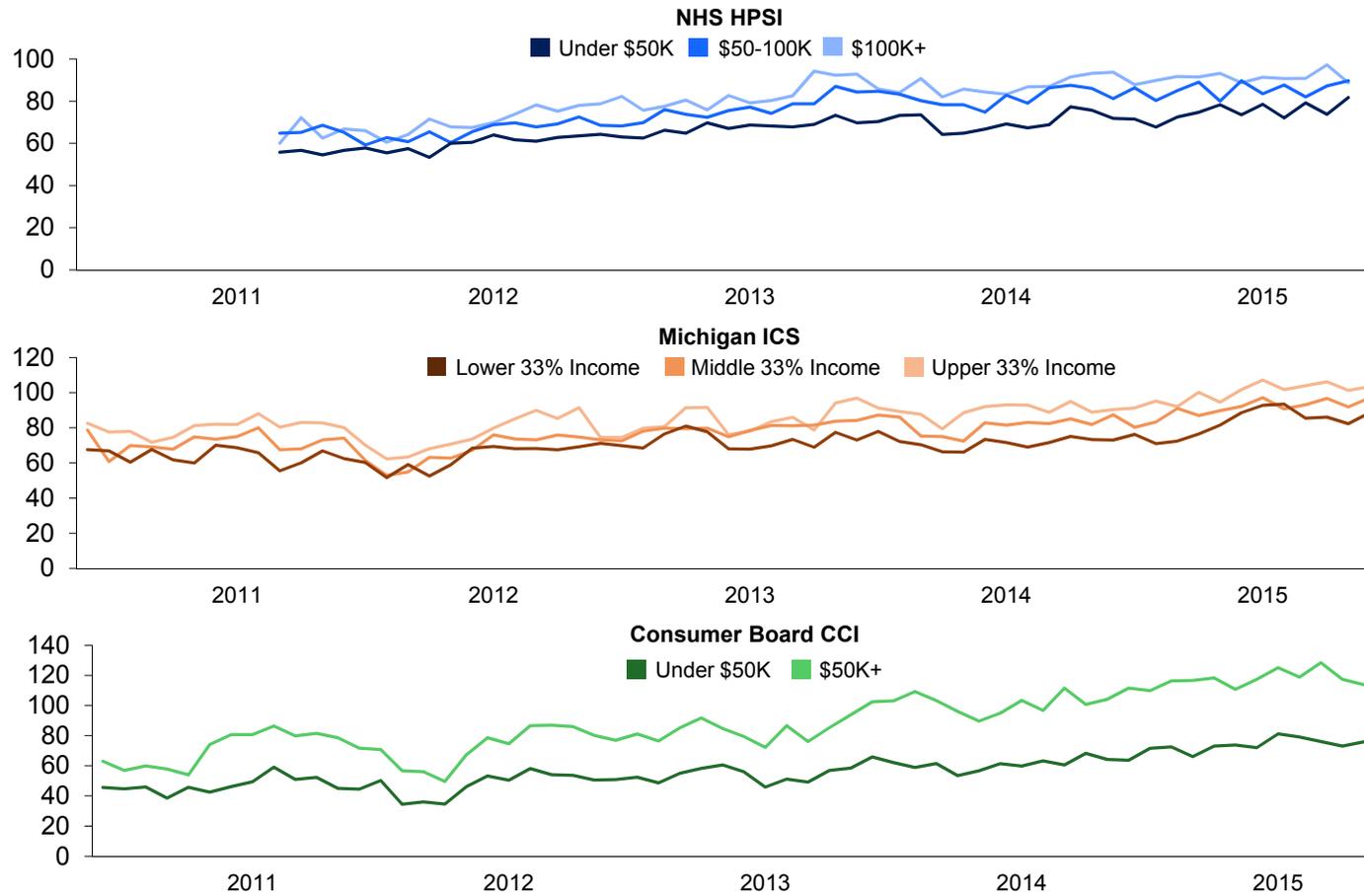
Variable	Obs	Mean	Std. Dev.	Min	Max
Fannie Mae HPSI ¹	52	73.1	7.8	59	85
Michigan ICS	61	77.9	9.2	56	98
Conference Board CCI	61	72.1	15.5	41	104

- The three time series all trending upwards for the observation period, HPSI and ICS have less variations than CCI
- High correlations, $r(\text{NHS}, \text{Michigan}) = 0.88$, $r(\text{NHS}, \text{Conference Board}) = 0.87$

1. The NHS HPSI didn't started until March 2011, we still present data for the other indices from June 2010 for consistency



Three Consumer Indices





Appendix



National Housing Survey

Background

- The Fannie Mae National Housing Survey is a monthly attitudinal survey, which polls the adult general population of the United States to assess their attitudes toward owning and renting a home, home purchase and rental prices, homeownership distress, household finances, and overall confidence in the economy.
- Each respondent is asked more than 100 questions, making the Fannie Mae National Housing Survey the most detailed attitudinal survey of its kind. The survey is conducted on a monthly basis to track attitudinal shifts that occur among Homebuyers and renters in the United States.

Survey Methodology

- Each month, beginning in June 2010, approximately 1,000 live (not automated) telephone interviews via landline and cell phone with Americans age 18 and older are conducted by Penn Schoen Berland (PSB), in coordination with Fannie Mae. The margin of error for the total monthly sample is ± 3.1 percent at the 95 percent confidence level and larger for sub-groups. Data collection occurs over the course of the first three weeks of each month although most occurs in the first two weeks of the month.

Monthly and Topic Analyses and Research Briefs

- Monthly reports provide a timely view of trends in consumers' attitudes using twelve key indicators.
<http://www.fanniemae.com/portal/research-and-analysis/housing-survey.html>
- Topic analyses provide deeper insights into one or more issues based on the compilation of three monthly samples. The three monthly studies that make up any given topic analysis are identical in wording and placement of questions. Additionally, research briefs are occasional and rigorous research reports, conducted internally or by external partners such as academics, exploring attitudes and behaviors on key issues.
<http://www.fanniemae.com/portal/research-and-analysis/consumer-research-analysis.html>



Table 1 – Consumer Survey Methods: NHS¹, Michigan², and Conference Board³

Survey Method	NHS	Michigan	Conference Board
Mode	40% landline and 60% cell phone dials ⁴	Landline and cellphone (starting in 2013) with unknown cellphone percentage	Mail
Sampling	Random digit dial	Random digital dial Also include a rotating panel with 60% first-timers and 40% re-interviewed 6 months later	Stratified, probability sample design, using USPS master address file as sampling frame
Weighting	Weighted to match the most recent Census 1-year American Community Survey estimates, in age, gender, race ethnicity, income, education, and housing tenure.	Both household weights and adult weights are calculated, to match the Census Current Population Surveys estimates, in age and income	Post stratification weighting structure to cover Census divisions, age, gender, and income
Sample size	1,000 monthly	250-300 for mid-month release 500 for end-of-month revision	About 2,500 for end-of-month release; 3,500 for later revision
Field period	The first three weeks of the month	Around first of the month through a few days before the release	Sent first of the month; Accepts returns through end of month
Fieldwork	Penn Schoen Berland	Michigan Survey Research Center	The Nielsen Company
Release	Generally, the 7 th of the next month	Preliminary figures at mid-month; final figures at end of the month	Prelim. figures, last Tuesday of month; final figures with next month's release
History	Monthly Since June, 2010	Started bimonthly in 1967; went to monthly in 1977	Started annually in 1946; quarterly in 1952 and monthly in 1978

1. Fannie Mae National Housing Survey Technical Notes <http://www.fanniemae.com/resources/file/research/housingsurvey/pdf/nhstechnicalnotes.pdf>
 2. University of Michigan Surveys of Consumers sample design <http://data.sca.isr.umich.edu/fetchdoc.php?docid=24773>
 3. Conference Board Consumer Confidence Survey Technical Note https://www.conference-board.org/pdf_free/press/TechnicalPDF_4134_1298367128.pdf
 4. From October, 2014, NHS increased cell phone dials from 25% to 60%, to obtain a 40% cell-phone-only (CPO) sample that matches the current national CPO household percentages as estimated by CDC <http://www.pewresearch.org/fact-tank/2014/07/08/two-of-every-five-u-s-households-have-only-wireless-phones/>



Table 2 – Consumer Survey Questions Analyzed

NO.	NHS Question	Comparative Survey/Source	Comparable Question/Data
1	Q10 In general do you think our economy is on the right track or is it off on the wrong track?	Gallup ¹	Do you think that economic conditions in the country as a whole are getting better or getting worse?
2	Q11 Looking ahead one year, do you expect your personal financial situation to get much better, somewhat better, stay about the same, get somewhat worse, or get much worse?	Michigan ²	A3 Now looking ahead--do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?
3	Q11b Now looking back over the past year, has your personal financial situation gotten much better, somewhat better, stayed about the same, gotten somewhat worse, or gotten much worse?	Michigan	A2 We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?
4	Q15 During the next 12 months, do you think home prices in general will go up, go down, or stay the same, as where they are now?	Michigan	A22b What do you think will happen to the prices of homes (like yours) in your community over the next 12 months? Will they increase at a rapid rate, increase at a moderate rate, remain about the same, decrease at a moderate rate, or decrease at a rapid rate?
5	Q16/Q17 By about what percent do you think home prices in general will go up/down on the average over the next 12 months?	Michigan	A22c By about what percent do you expect prices of homes like yours in your community to go (up/down), on average over the next 12 months?
6	Q12 In general, do you think this is a very good time to buy a house, a somewhat good time, a somewhat bad time, or a very bad time to buy a house?	Michigan	A16 Generally speaking, do you think now is a good time or a bad time to buy a house?

1. Gallup U.S. Daily Survey
2. University of Michigan Survey of Consumers



Table 2 – Consumer Survey Questions Analyzed (Continued)

NO.	NHS Question	Comparative Survey/Source	Comparable Question/Data
7	Q13 In general, do you think this is a very good time to sell a house, a somewhat good time, a somewhat bad time, or a very bad time to sell a house?	Michigan	A17 What about selling a house -- generally speaking, do you think now is a good time or bad time to sell a house?
8	Q20b During the next 12 months, do you think home mortgage interest rates will go up, go down, or stay the same as where they are now?	Michigan	A11 No one can say for sure, but what do you think will happen to interest rates for borrowing money during the next 12 months--will they go up, stay the same, or go down?
		Conference Board ³	What do you think will happen to interest rates [over the next 12 months]?
9	Q112b How concerned are you that you will lose your job in the next twelve months? Are you very concerned, somewhat concerned, not very concerned, or not at all concerned that you will lose your job in the next twelve months?	Michigan	A10 How about people out of work during the coming 12 months--do you think that there will be more unemployment than now, about the same, or less?
		Conference Board	Six months from now, do you think there will be [more/same/fewer] jobs available in your area?
10	Home Purchase Sentiment Index	Michigan	Index of Consumer Sentiment

3. Conference Board Consumer Confidence Survey



The Fannie Mae Home Purchase Sentiment Index (HPSI): The Average of Six Questions from Fannie Mae's NHS

$$HPSI = \frac{Q12 + Q13 + Q15 + Q20B + Q112B + Q116}{6} + 63.5$$

Number	NHS Question
Q12	Net Good Time to Buy <i>(Very and Somewhat Good Time To Buy - Very and Somewhat Bad Time To Buy)</i>
Q13	Net Good Time to Sell <i>(Very and Somewhat Good Time To Sell - Very and Somewhat Bad Time To Sell)</i>
Q15	Net Home Prices Will Go Up (next 12 months) <i>(Home Prices Will Go Up – Home Prices Will Go Down)</i>
Q20B	Net Mortgage Rates Will Go Down (next 12 months) <i>(Mortgage Rates Will Go Down – Mortgage Rates Will Go Up)</i>
Q112B	Net Confident about Not Losing Job (next 12 months) <i>(Not at All and Not Very Concerned about Losing Job – Very and Somewhat Concerned about Losing Job)</i>
Q116	Net Household Income is Significantly Higher (past 12 months) <i>(Income is Significantly Higher – Income is Significantly Lower)</i>

Notes:

1. Survey responses are expressed as net percent positive, e.g., good minus bad, up minus down.
2. The net percent positives for each question are weighted equally in calculating the HPSI.
3. HPSI set to 60 at March, 2011, the first month that Question 112B was asked in the NHS.