

Using Attitude Data to Forecast Housing Activity

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Abstract. Several national surveys generate monthly indicators of housing market activity that are released weeks before the “hard” housing statistics (starts, new home sales, existing home sales) for that month. This paper examines whether these surveys of consumers, lenders and builders can help predict what the current month’s housing statistics will be. The conclusion is that these surveys, with the exception of homebuilders’ attitudes, add little predictive power to that available from the housing series’ own histories and from mortgage interest rates.

Introduction

In recent years a variety of privately sponsored surveys have emerged that provide information about current housing market conditions. These surveys complement the “hard” data on housing activity available from monthly surveys fielded by the U.S. Bureau of the Census and by the National Association of Realtors.

Earliest among these private surveys, dating back at least fifteen years, are the monthly interviews of consumers conducted by the University of Michigan and by the Conference Board. Both surveys contain questions about homebuying attitudes. Then in the early 1980s the National Association of Home Builders began a monthly survey of builder attitudes. Most recently, in 1990 the Mortgage Bankers Association began a weekly survey of loan applications.

While these private surveys have multiple purposes, one potential use is to aid in the interpretation and forecasting of the statistics that enter directly into GDP: single-family housing starts, new home sales, and existing home sales. One feature of these surveys is that their results are released three or four weeks before the hard data on housing activity for that month. An obvious question is whether these surveys help to forecast what the housing data for that month will be. That is the question addressed here.

Forecasting construction and home sales with the attitude data might be a useful complement to other methods of projecting high-frequency changes in housing activity. These alternative approaches include time series modelling (Sklarz, Miller and Gersch, 1987) and prediction based on weather abnormalities (Goodman, 1987).

Summary of the Survey Data

Consumer Surveys

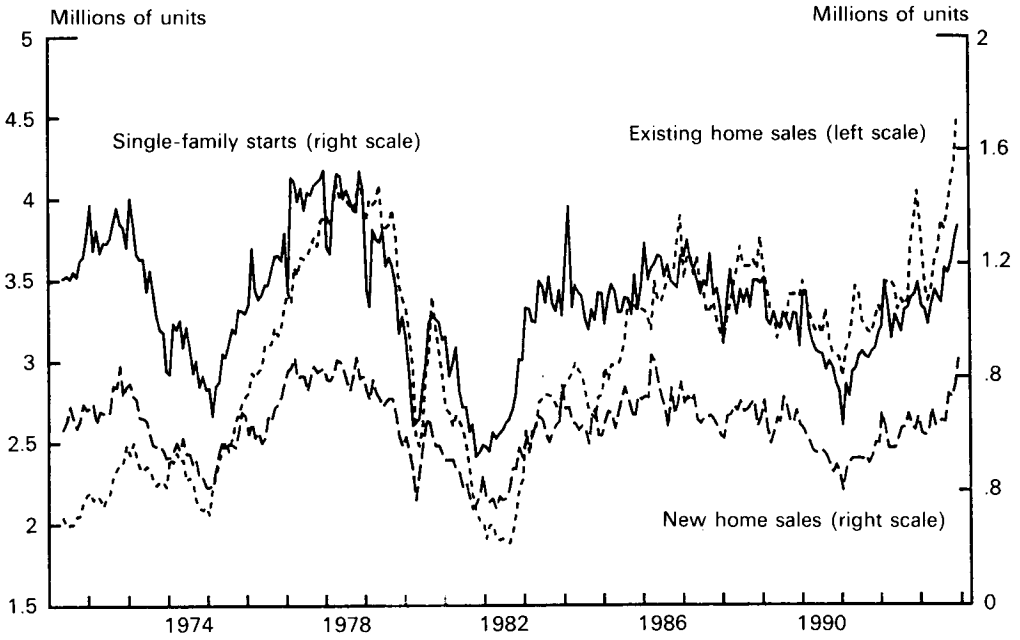
The Survey Research Center at the University of Michigan monthly asks a rotating

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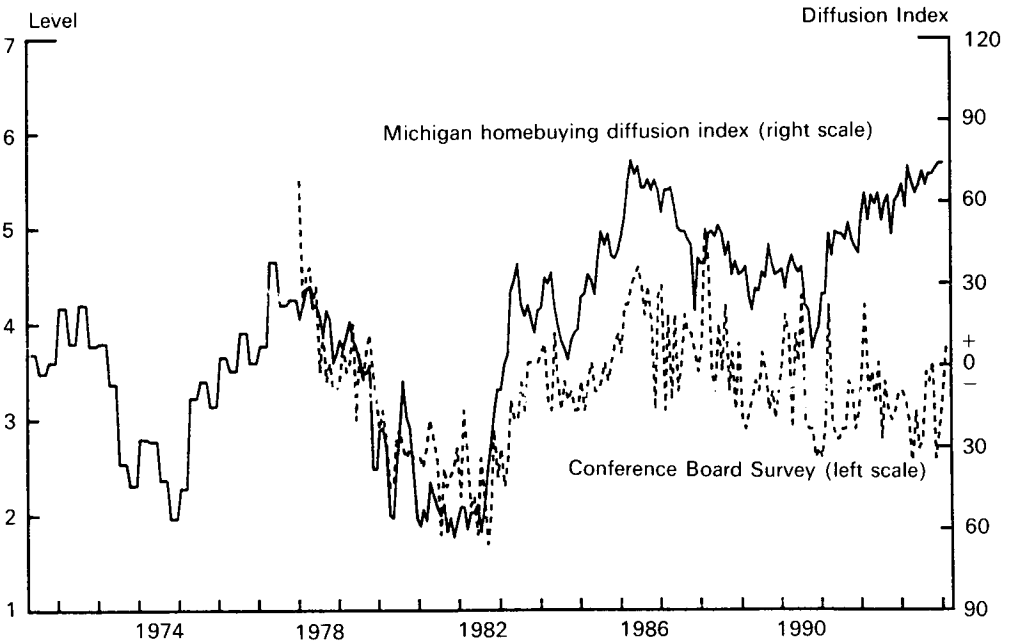
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Exhibit 1 Housing Data and Consumer Attitudes

Housing Starts and New and Existing Home Sales (SAAR)



Consumer Attitudes (NSA)



panel of 500 representative household heads, Do you think now is a good time to buy a house? The Conference Board monthly asks 5000 respondents nationwide, Do you plan to buy a house in the next six months? In addition to these questions, both surveys generate overall indexes of consumer sentiment, based on responses to several questions.

Consumer demand should lead to home sales and, perhaps, housing starts. The Michigan and Conference Board questions have different strengths in capturing this demand. The Conference Board question is the more direct, because it asks about actual plans to buy. But because buying a home is a rare event, the monthly responses are volatile (Exhibit 1, bottom graph). The Michigan question is less direct, but provides a more stable time series of responses.

Homebuilder Attitudes

The National Association of Homebuilders (NAHB) conducts a monthly survey of homebuilders nationwide, usually receiving approximately 400 responses. Among the questions asked are an assessment of current home sales: How do you rate new home sales at the present time? Good, Fair, or Poor?

The frame of reference for this question is undefined. Presumably builders develop notions about typical conditions based on their own long-run experience. Consistent with this view, homebuilders' assessments appear to move cyclically with starts and new home sales (Exhibit 2). The NAHB index is seasonally adjusted via the standard X-11 method.

Loan Applications at Mortgage Bankers

Every week the Mortgage Bankers Association (MBA) surveys a national sample of approximately twenty predominantly large mortgage banking firms. Loan applications received by these firms are classified by whether they are for home purchase or for refinancing. The purchase index is a centered three-week moving average of applications received for home purchase, and the index value is set to 100 for March 1990. The index is seasonally adjusted judgmentally, based on the seasonal patterns in related housing statistics.

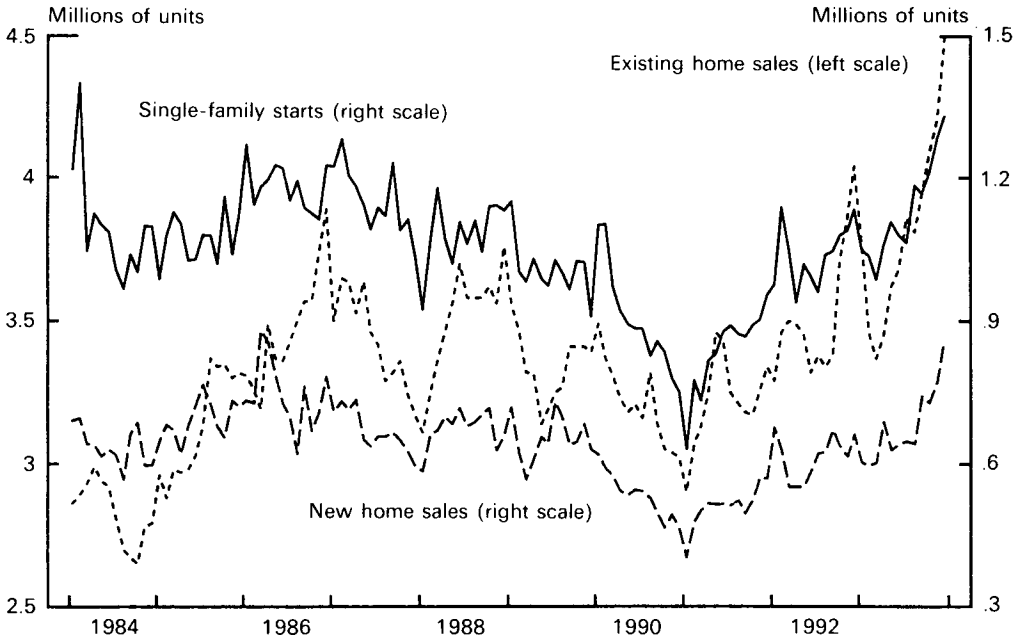
Most loan applications for home purchase are for purchase of an existing home, so the MBA index might be expected to correlate most closely with existing home sales (Exhibit 3). Mortgage bankers' share of the mortgage market varies over time, and this injects some noise into the relationship between this index and the housing measures.

Empirical Approach

For convenience, we will refer to these surveys as generating attitude data, even though this label does not strictly fit the MBA index, which is based on the number of mortgage applications. In all instances we use the survey responses as published:

Exhibit 2 Housing Data and Home Builder Attitudes

Housing Starts and New and Existing Home Sales (SAAR)



Builders' Rating of Current Sales (SA)

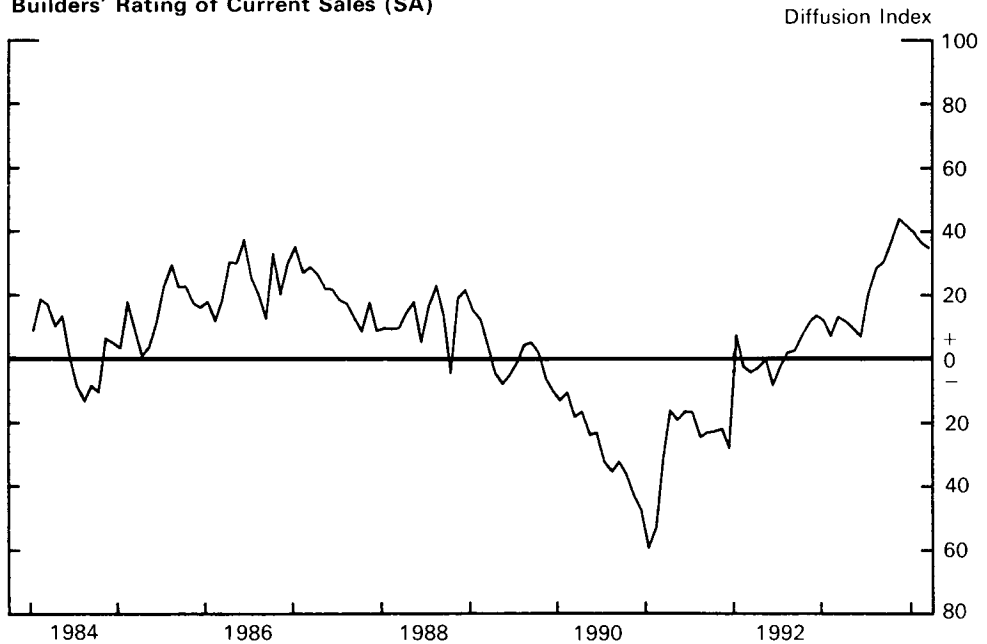
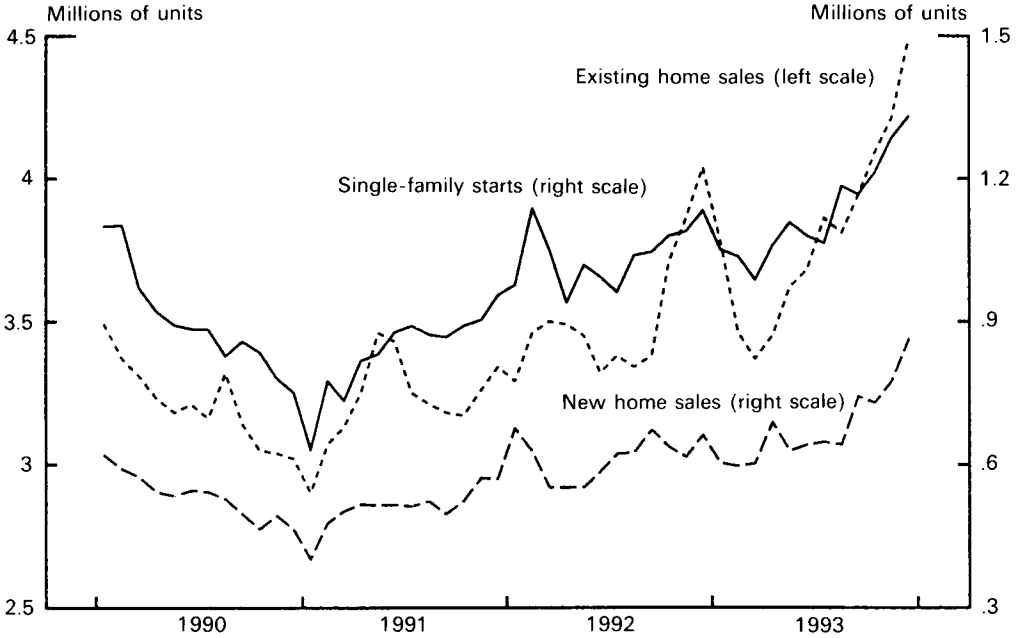
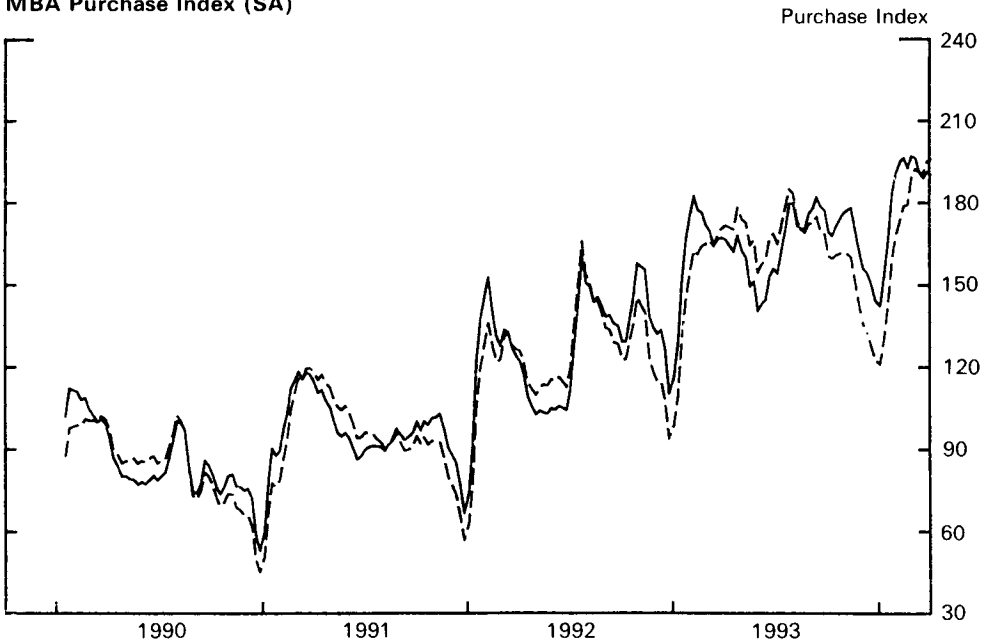


Exhibit 3 Housing Data and Mortgage Applications

Housing Starts and New and Existing Home Sales (SAAR)



MBA Purchase Index (SA)



the MBA and NAHB indexes are published seasonally adjusted, but the Michigan and Conference Board surveys are not. In the estimation, the Michigan and NAHB responses are cast as diffusion indexes (% responding "good" minus percent responding "bad").

The attitude data generally move in line with the housing statistics, although Exhibits 1-3 illustrate that the relationships vary considerably from measure to measure. The following equation was used to test for the forecasting power of the attitude variables:

$$Y_t = \alpha + \sum_{n=1}^3 b_n Y_{t-n} + b_{12} Y_{t-12} + \sum_{m=0}^3 c_m W_{t-m} + \sum_{k=0}^3 s_k X_{t-k} + e_t, \quad (1)$$

where

Y_t = a measure of housing market activity in month t : either single-family housing starts, new home sales, or existing home sales, in all instances the published seasonally adjusted annual rate;

W_{t-m} = the average contract interest rate on new commitments for conventional fixed-rate mortgages in month $t-m$;

X_{t-k} = the attitude measure in month $t-k$;

e = a stochastic error.

The twelfth lag of Y is included to capture possible incomplete seasonal adjustment. Interest rates are included in the specification because, presumably, nominal interest rates are an important determinant of housing demand and because, like attitudes, interest rates during a month are available before the housing measures are released.

The model in equation 1 was estimated in first differences of all variables. Estimation in first differences minimizes the chances of generating spurious regressions (Maddala, 1992). In addition, our interest is more in the short-run relationships between the attitude measures and the housing statistics, and first differences are better suited to this purpose.

The criterion for judging the forecasting ability of the attitude data is whether the addition of the X -variables to equation (1) significantly increases the R^2 -statistic above its level when the X -variables are omitted. Because our interest is in overall forecasting power, the coefficients on individual variables are not presented.

Results

The adjusted R^2 -statistics from a variety of models paint a fairly consistent picture (Exhibit 4). The attitude data typically add little explanatory power to the models; in many instances they add none. (The attitude variables are available for different time periods, and comparisons across equations are appropriate only for the same periods.) For statistical significance at the .05 level, the attitude variables must add three-to-five percentage points to the adjusted R^2 from the regression with only interest rates and lagged values of the dependent variable on the right-hand side. This threshold is reached in few of the specifications. Even in those instances where the increment to explanatory power is statistically significant, one might question whether the gain is substantively important.

Exhibit 4
Adjusted R^2 -Statistics from Forecasting Models Estimated in
First Differences of All Variables

Independent Variable Set	Dependent Variable		
	Single-family Starts	New Home Sales	Existing Home Sales
	August 1971–December 1993		
Y	.05	.02	.03
Y,W	.20	.25	.22
Y,W,X1 a	.21	.26	.23
X1 a	.02	.07	.15
	April 1984–December 1993		
Y	.14	.06	.00
Y,W	.22	.19	.09
Y,W,X1 a	.25	.19	.09
Y,W,X1 b	.28	.18	.13
Y,W,X2	.28	.21	.14
X1 a	.02	.02	.07
X1 b	.02	.00	.05
X2	.06	.00	.15
	May 1990–December 1993		
Y	.00	.00	.05
Y,W	.15	.07	.24
Y,W,X1 a	.23	.14	.21
Y,W,X1 b	.26	.00	.20
Y,W,X2	.46	.30	.22
Y,W,X3	.30	.03	.21
X1 a	.08	.04	.00
X1 b	.00	.00	.00
X2	.27	.09	.09
X3	.24	.00	.08

Note: Negative estimates of adjusted R -squared are set to zero.

Variable definitions (see text and equation 1 for details):

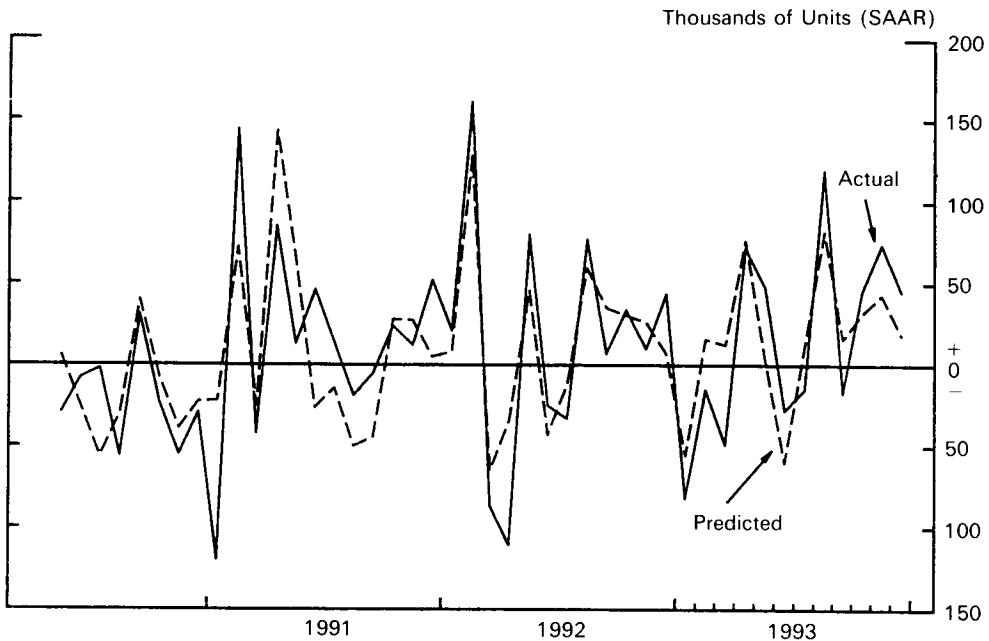
- Y=lagged values of dependent variable;
- W=current and lagged values of mortgage interest rate;
- X1 a=Michigan homebuying attitudes;
- X1 b=Conference Board homebuying plans;
- X2=NAHB builders' sentiment;
- X3=MBA purchase applications index.

The one exception to this pattern of insignificance is the forecasting power of homebuilder attitudes, especially for 1990–93. During this period builders' attitudes add substantially to the accuracy of the forecasts of both starts and new home sales. This model captures most of the large monthly swings in starts during this period (Exhibit 5). It is not clear why this variable performs so much better during this period than during the period beginning in 1984.

Other Tests

In addition to the results reported in Exhibit 4, other specifications were tested. The

Exhibit 5
Monthly Change in Housing Starts
 (actual and predicted)*



*predicted based on model with lagged dependent variable, mortgage rate, and homebuilder assessments of current sales on the right-hand side

first modified the seasonal adjustment schemes. The Michigan consumer attitudes were seasonally adjusted, and alternative adjustment schemes to that in the published MBA index were used. While these modifications resulted in some improvement in the models' fit, the gains were modest, and neither of these refinements altered the basic pattern shown in Exhibit 4.

Next, the overall consumer sentiment indexes generated by the Michigan and Conference Board surveys were substituted for the homebuying attitudes. No significant predictive power was found. Another question from the NAHB survey asks builders to rate (good, fair, poor) the current volume of customer traffic at their building sites. This variable performed about as well overall as current sales assessments in predicting starts and sales. Finally, experiments with alternative lag structures to those in equation (1) had no appreciable effect on the results.

Conclusion

The power of the attitude data to forecast the current month's housing statistics is minimal, with the exception of the recent performance of homebuilder attitudes. But the attitude data have a variety of uses, and the conclusion about this one application

is not intended as an overall assessment of the value of the surveys. Indeed, there may even be forecasting tasks other than the one presented here for which these data are useful, although our tests seem among the most likely to reveal any forecasting power.

References

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Maddala, G. S., *Introduction to Econometrics*, New York: Macmillan, second edition 1992.
Sklarz, M. A., N. G. Miller and W. Gersch, Forecasting Using Long-Order Autoregressive Processes: An Example Using Housing Starts, *AREUEA Journal*, Winter 1987, 15, 374-88.

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