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Households Predict where the Macroeconomy is Headed?

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Can Households Predict where the Macroeconomy is Headed?

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Abstract

In this paper, we evaluate households' directional forecasts of inflation and the unemployment rate in Sweden. The analysis is conducted using monthly forecasts from the National Institute of Economic Research's *Economic Tendency Survey* that range from January 1996 until August 2019. Results indicate that households have statistically significant ability to forecast where the unemployment is headed, but they fail in predicting the direction of future inflation.

JEL Classification: E37

Keywords: Survey data, Directional forecasts, Inflation, Unemployment

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1. Introduction

Survey data on households' expectations are widely used for forecasting purposes. For instance, consumer confidence indicators based on survey data are often employed in econometric models in order to forecast consumption growth.[1] However, some survey data take the form of a forecast themselves. This raises the question of what their forecasting properties are.

In this paper, we contribute to the literature which has analysed the forecasting properties of household survey data; see, for example, Batchelor and Dua (1989), Thomas (1999), Trehan (2015) and Berge (2018). Using monthly data from the National Institute of Economic Research's *Economic Tendency Survey* regarding the directional change, we evaluate households' directional forecasts of inflation and the unemployment rate in Sweden. While directional forecasts are less commonly evaluated than numerical forecasts in the macroeconomic literature, it is obviously of interest to find out whether households are able to predict where the macroeconomy is headed.[2] If households can forecast directional change well, this could indicate that they are well-informed economic agents and that, for example, it might be relevant for policy makers or financial market actors to pay attention to their forecasts.

2. Data and empirical analysis

We use data from the *Economic Tendency Survey* in which 1500 Swedish households are interviewed each month. This is Sweden's most important household survey and data from it on inflation- and mortgage-rate expectations have been analysed in, for example, Jonung (1981), Palmquist and Strömberg (2004) and Hjalmarsson and Österholm (2017, 2019). Data from the survey are also commonly used for macroeconomic forecasting; see, for example, Hansson *et al.* (2005),

Two questions are analysed, related to inflation and the unemployment rate. The questions – and the answers available to the respondents – are given below:

[1] See, for example, Carroll *et al.* (1994), Easaw and Herevi (2004) and Dreger and Kholodilin (2013) for just a few contributions to a fairly voluminous literature.

[2] A fairly large literature evaluating forecasts of directional change in macroeconomics nevertheless exists; see, for example, Greer (2003), Baghestani *et al.* (2015) and Driver and Meade (2019).

Q6. Compared to the situation today, do you think that in the next 12 months prices in general will...?

i. Increase faster
ii. Increase at the same rate
iii. Increase at a slower rate
iv. Stay about the same
v. Fall slightly
vi. Don't know

Q7. How do you think the level of unemployment in the country will change over the next 12 months? Will it...?

i. Increase sharply
ii. Increase slightly
iii. Remain the same
iv. Fall slightly
v. Fall sharply
vi. Don't know

The survey data are monthly and range from January 1996 to August 2019. These are evaluated against the outcomes for CPI inflation and the unemployment rate (seasonally adjusted, age group 16 to 64 years); the last available observation for outcomes is from August 2020. In order to econometrically analyse the forecasting performance of the survey data, we generate a directional forecast. This is achieved by first taking the balance, b_t, of the share of respondents (in percent) that at time t predicted an increase minus the share that predicted a decrease. This balance is accordingly similar to so-called diffusion indices that commonly are generated from survey data; see, for example, OECD (2000) and Pinto *et al.* (2020). We then turn the balance into a directional forecast, x_t, according to the rule $x_t = 1$ (indicating an increase) if $b_t > 0$ and $x_t = 0$ (indicating a decrease) if $b_t \leq 0$.[3] It should be noted that for inflation, the balance is calculated by taking the first alternative (which indicates an increase in inflation) minus the third, fourth and fifth alternatives (which all indicate a decrease in inflation). For unemployment, the balance is more intuitively generated as the sum of the first two alternatives minus the sum of the fourth and fifth.

Forecasted variables and their directional changes, as well as directional forecasts and balances are provided in Figures 1 and 2. Panel A displays the forecasted variable and also captures the match of the directional forecast with the actual directional change. It should be noted that the actual directional change has been aligned with the forecast origin date – that is, at a given date it indicates the

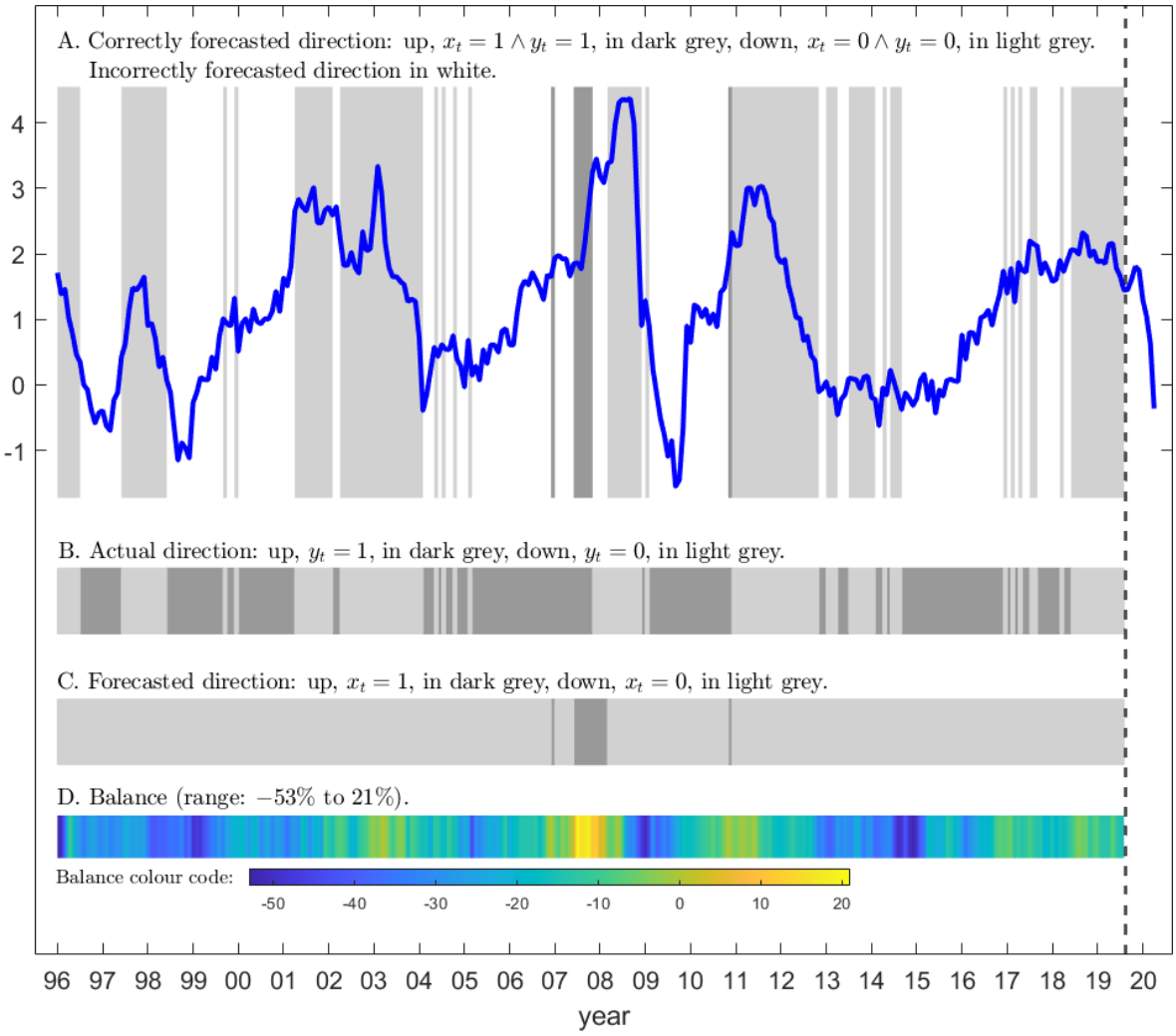
[3] We have removed the possibility of having "unchanged" as a category by merging $b_t = 0$ and $b_t < 0$. This is reasonable though as $b_t = 0$ in only three cases for inflation and two cases for the unemployment rate.

directional change between that date and twelve months later. The actual directional change, y_t, is coded analogously to x_t, namely $y_t = 1$ if the variable increases over the twelve-month horizon and $y_t = 0$ otherwise. Panel B records the actual directional change of the forecasted variable (aligned with the forecast origin date). Panel C records the directional forecast x_t that was calculated from the balance b_t; the balance is visualised in the form of a heat map in panel D. Observe that the correctly forecasted directions in panel A follow from the intersection of directions in panels B and C.

Looking at the figures, it is worth pointing out that the inflation expectations appear somewhat peculiar as it is extremely rare that an increase in inflation is predicted (dark grey in panel C of Figure 1). This might be due to the formulation of the question. Recall that survey question Q6 is given in terms of prices (and not inflation). This could be problematic for a respondent used to thinking about inflation; this is not unlikely to be the case in Sweden since formal inflation targeting was introduced already in 1995 and communication typically concerns inflation (and not prices). In addition, we note that only one of the possible answers implies that inflation will increase – a feature which also has the possibility to skew the respondents' answers.

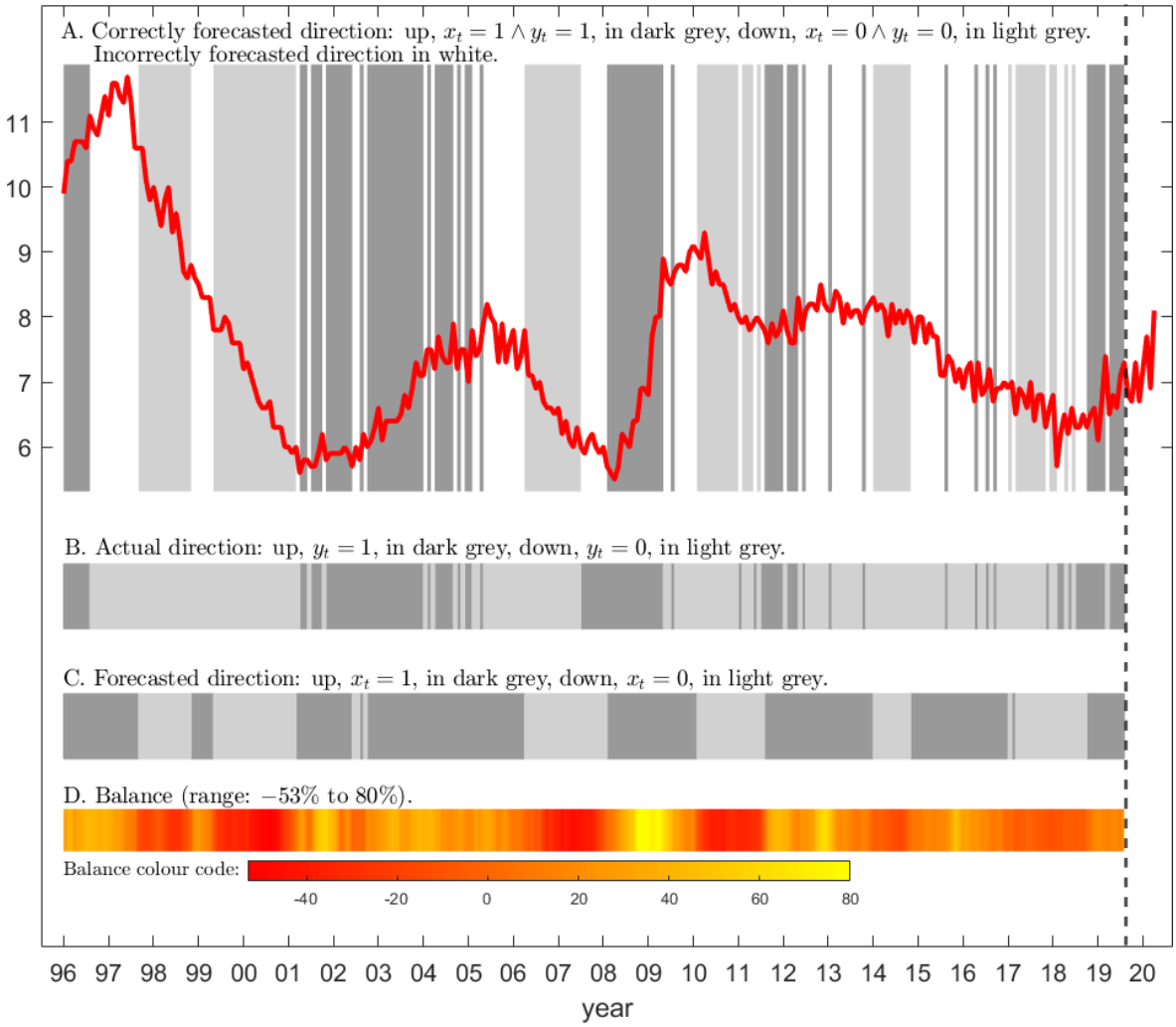
We assess the accuracy of the directional forecasts by employing the Pesaran and Timmermann (1992) test with a Newey-West correction for the presence of serial correlation (Blaskowitz and Herwartz, 2014). This test can be seen as a test of independence in the 2×2 contingency-table setting. The 2×2 tables to test the independence between the forecast and the realized directional change for our two variables, as well as the test results, are reported in Table 1. The Pesaran-Timmermann test statistic, t_{PT}, clearly confirms what is suggested by the figures. The null hypothesis of independence cannot be rejected for inflation but is forcefully rejected for the unemployment rate. We accordingly conclude that Swedish households are unable to forecast where inflation is headed, whereas they have highly significant ability in forecasting the direction of the unemployment rate.

Figure 1. Directional forecast of inflation.



Note: Panel A: The blue line gives CPI inflation (year-on-year, in percent). Correctly forecasted direction in dark and light grey; incorrectly forecasted direction in white. Panel B: Actual directional change of inflation aligned with the forecast origin date. Panel C: Forecasted directional change aligned with the forecast origin date. Panel D: Inflation balance in the form of a heat map. The balance is the share of the respondents in the survey who answer that the inflation rate will increase minus the share that says it will decrease. Vertical dashed line indicates last forecast that can be evaluated.

Figure 2. Directional forecast of the unemployment rate.



Note: Panel A: The red line gives the unemployment rate (in percent). Correctly forecasted direction in dark and light grey; incorrectly forecasted direction in white. Panel B: Actual directional change of the unemployment rate aligned with the forecast origin date. Panel C: Forecasted directional change aligned with the forecast origin date. Panel D: Unemployment rate balance in the form of a heat map. The balance is the share of the respondents in the survey who answer that the unemployment rate will increase minus the share that says it will decrease. Vertical dashed line indicates last forecast that can be evaluated.

Table 1. Results from the Pesaran and Timmermann test.

	Inflation			Unemployment rate	
	Actual up (y_t=1)	Actual down (y_t=0)		Actual up (y_t=1)	Actual down (y_t=0)
Forecast up (x_t=1)	7	4	Forecast up (x_t=1)	86	89
Forecast down (x_t=0)	149	124	Forecast down (x_t=0)	20	89
p	0.46		p	0.62	
p_{H0}	0.45		p_{H0}	0.47	
t_{PT}	0.43		t_{PT}	3.47	
p-value	0.664		p-value	<0.001	

Note: The 2×2 contingency tables of 284 forecasts to test the independence between the households' forecast and actual direction. "p" is the proportion of correct forecasts, whereas "p_{H0}" is the expected proportion of correct forecasts under the null hypothesis of independence. "t_{PT}" and "p-value" are the Pesaran-Timmermann t-statistic (calculated using Newey-West standard errors) and its p-value respectively.

3. Concluding remarks

In this paper we have shown that Swedish households have statistically significant ability in forecasting the direction of the future unemployment rate, while they fail in forecasting where inflation is headed. The latter finding might be due to the phrasing of the question and/or the answers available; it could be the case that some respondents do not have sufficient "economic literacy" to pass the hurdle posed by this feature of the survey. This is something that designers of household surveys ought to keep in mind when constructing questions.

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