

Brückbauer, Frank; Schröder, Michael

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Data Observer

Frank Brückbauer and Michael Schröder*

The ZEW Financial Market Survey Panel

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Abstract: The ZEW Financial Market Survey is a monthly panel survey among financial market experts that was launched in December 1991. The survey focuses on the experts' expectations about international financial markets and macroeconomic developments. We describe the ZEW Financial Market Survey and the resulting research dataset, which is available for free for academic researchers, is large and includes long individual time series (99,001 responses by 2002 respondents, as of September 2021), and contains rich information on the financial market experts collected over the years and which can be combined with the data on expectations.

Keywords: ZEW Financial Market Survey, financial market experts, financial market expectations

JEL Classification: C8, D84, G17, G4

1 Introduction

The aim of this paper is to describe the ZEW Financial Market Survey (ZEW FMS) research dataset. The research dataset results from the ZEW Financial Market Survey, which is a monthly panel survey among financial market experts. The survey focuses on the experts' expectations about international financial markets and macroeconomic developments. It was launched in December 1991 and has been conducted every month since then. The primary goal of the survey is to build a high-quality empirical basis for academic research on expectation formation.

Since the launch of the ZEW FMS, ZEW Mannheim has systematically collected the survey responses and has offered the continuously growing database to academic researchers. The ZEW FMS dataset has been well received

*Corresponding author: Michael Schröder, ZEW Mannheim, Mannheim, Germany,

E-mail: Michael.Schroeder@zew.de

Frank Brückbauer, ZEW Mannheim, Mannheim, Germany, E-mail: Frank.Brueckbauer@zew.de

in academic research. As of September 2021, we are aware of 53 academic studies that make use of ZEW FMS data.

Over the past 30 years, the ZEW FMS research dataset has evolved into a valuable resource for those who study how macroeconomic and financial expectations are formed. With 99,001 responses by 2002 participants as of September 2021, the research dataset is large and includes long individual time series. Many interesting events fall into the survey period, whose effects on expectations can be studied. For example, the survey period includes the creation of the Euro area and the introduction of the Euro, the Dot-com crisis, the Great Financial Crisis, the European Sovereign Debt Crisis, the COVID-19 crisis, as well as the crisis due to Russia's war against the Ukraine.

A secondary goal of the ZEW FMS is the provision of economic and financial indicators to the public. ZEW Mannheim regularly publishes the aggregate results of the survey and communicates the key results to the public. The most important indicator arising from the ZEW FMS is the ZEW Indicator of Economic Sentiment (ZEW-Konjunkturerwartungen), which measures the participants' expectation for economic growth over the coming six months. After early analyses of the forecasting power of this index for industrial production in Germany (see Hüfner and Schröder 2002a, 2002b), the ZEW Indicator of Economic Sentiment has gained public attention and became one of the leading business cycle indicators for the German economy.

2 The ZEW Financial Market Survey

The ZEW FMS data are collected in an ongoing panel survey among financial market experts. The target group for the ZEW FMS panel encompasses professionals working in financial institutions and financial divisions of non-financial firms. Moreover, the professionals have to hold positions in which they have to deal with macroeconomic as well as financial developments. Examples are economists working in macroeconomic research departments of banks and portfolio and fund managers working at asset management or investment firms.

ZEW Mannheim identifies and recruits panel members using publicly available information about financial market experts. The information sources for the identification of potential candidates are firm websites and professional networking platforms. When potential candidates are identified, ZEW Mannheim sends them an invitation to join the ZEW FMS panel. In earlier years, invitations were sent via regular mail. In recent years, invitations are sent via e-mail or – very recently – via a direct message on professional social network platforms.

Currently, each invitation contains a short description of the survey, the latest questionnaire, the latest ZEW Financial Market Report,¹ and the link to an online form, which interested financial market experts can use to register for the ZEW FMS. If a panel member exits, the aim is to find a successor from the same department, or, if not possible, from the same firm.

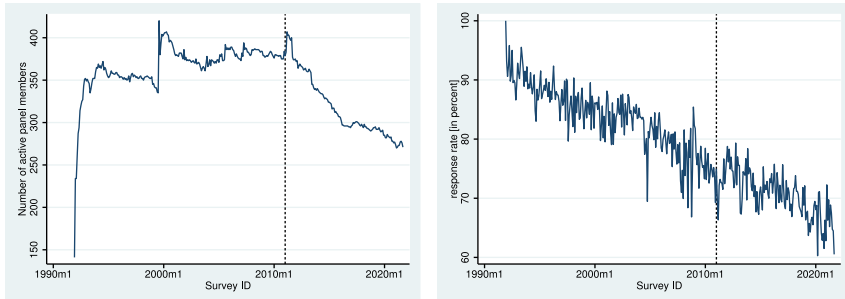
The ZEW FMS has been conducted every month since December 1991. As of September 2021, the ZEW FMS dataset includes a total of 99,001 responses by 2002 financial market experts. Between December 1991 and November 2002, ZEW Mannheim conducted the FMS only via mail and fax. Paper questionnaires were sent out by mail or fax, and the respondents either mailed or faxed them back with their answers. Starting from December 2002, ZEW Mannheim introduced the possibility to participate via an online questionnaire. Online participation has reached a share of 100 percent in 2021.

2.1 Historical Response Behavior

Figure 1 provides details about the size of the ZEW FMS panel and the historical response behavior over the lifetime of the ZEW FMS. Whether panel members are active or have left the panel is not documented for survey waves before 2011. For these survey waves, we thus estimate the status of panel members with the help of response data. We assume that these panel members were active in the periods between their first responses and their last responses. Note that the resulting values are only rough approximations of the actual number of active panel members. For example, if panel members first participated after the month they entered the panel, the estimated number of active panel members is understated for all periods between the month they entered and the month of their first participation.

Figure 1a shows the number of active members of the ZEW FMS panel since December 1991. The time series reveals two phases of rapid panel expansion. The first phase took place in the first year of the survey's existence, in which the number of active participants increased from 141 in December 1991 to around 350. The second phase took place in August 1998, when the number of active panel members increased to 420 from 335 in September 1998. With an average of 380, the size of the ZEW FMS panel was relatively

¹ The ZEW Financial Market Report is a monthly publication of ZEW Mannheim, which contains an analysis of the results of the ZEW FMS.



(a) Number of active panel members by survey wave (b) Response rate by survey wave

Figure 1: Panel size and response behavior.

These figures show the size of the panel and historical response behavior over the lifetime of the ZEW FMS. The vertical dashed lines in Figures 1a and 1b separate the periods for which the number of active panel members is documented and for which it is not. The values for number of active panel members and the response rate before 2011 are approximated from response data.

stable in the 2000s. The local maximum of 407 panel members in March 2011 marks the start of a downward trend. In September 2021, the ZEW FMS panel had 271 active panel members and the total number of panel members since the start of the survey was 2002. Figure 1b reveals that the response rate of the ZEW FMS has been trending down since the start of the ZEW FMS and is highly volatile. In the survey's first year, the estimated response rate fluctuated around about 90 percent. Between September 2020 and September 2021, the response rate was on average 65.7 percent and fluctuated between 60.5 and 72.3 percent.

The cumulative distribution of the number of participations by panel member depicted in Figure 2 reveals that the ZEW FMS dataset features long individual time series. The number of responses by ZEW FMS panel members ranges from 1 to 350 with an average of 49.45. While about 20 percent answered only 1 or 2 times, about 30 percent of the respondents participated more than 50 times, and about 20 percent more than a 100 times. Half of the panel members responded more than 18 times. More detailed information on e.g. the composition of the panel, the development of the cross-section over time, information on the professional experience of the participants etc. can be found in Section 2.2 of Brückbauer and Schröder (2021).

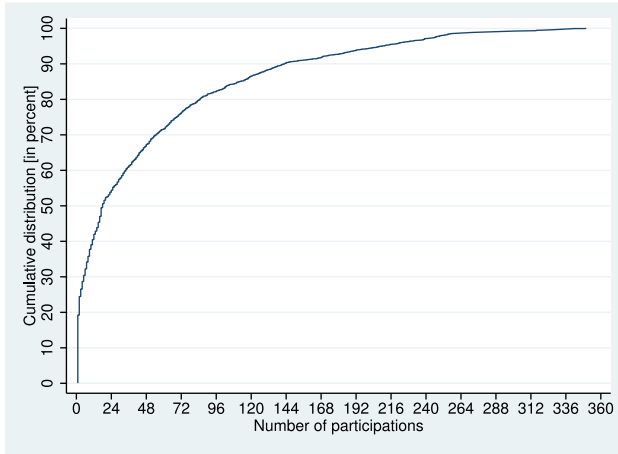


Figure 2: The distribution of the number of participations by panel member.

3 Content of the ZEW FMS

The questionnaire of the ZEW FMS has two parts. The first part consists of eight fixed questions and their sub-questions, which are asked every month. The second part varies across surveys. It includes questions that are asked regularly but have a quarterly frequency. It also might include questions on topics of current interest or questions which are included as part of a ZEW study or project.

Figure 3 shows the current questionnaire, which has been in use since April 2021.² The eight questions ask for (1) the assessment of the current economic situation, expectations on (2) the future economic situation, (3) inflation rates, (4) short-term interest rates, (5) long-term interest rates, (6) stock indexes, (7) currencies, and (8) the profitability of German sectors. The country coverage for most of the questions is Germany, the Euro area, the US, and China. While China was added in April 2020, Great Britain, France, Italy, and Japan were removed in the same month.

The majority of the questions of the current and the earlier questionnaires ask for the expected direction of the change of a financial or macroeconomic factor for a specific country or region over the coming six months. Overall, all of these questions are similar as they require the formulation of expectations or assessment using four pre-defined categories: a good state (e.g. “good” or “improve”), a neutral

² The questionnaire used before can be found in Appendix ??.

ZEW

Financial Market Survey April 2021

Please send back until April 9, 2021

President: Prof. Achim Wambach, PhD

Research Department:

International Finance and Financial Management

P.O. Box 103443, 68034 Mannheim

Tel. +49(0)621 1235 -148 / -311 / -368 / Fax -4223

Project Team:

Frank Brückbauer, Dr. Jesper Riedler, Dr. Michael Schröder

Code:

Company:

Department:

Contact:

Address Changes:

Are you the addressed person? ☐ yes ☐ no (e.g. deputy)

All information will be handled confidentially. Your responses will be analysed anonymously.

1. We estimate the overall macroeconomic situation as being

	good	normal	bad	no estimate
Eurozone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Germany	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
China	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2a. In the medium-term (6 months) the overall macro-economic situation will

	improve	not change	worsen	no estimate
Eurozone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Germany	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
China	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2b. Please assess the probability of the following medium-term (6 months) developments of the overall macroeconomic situation in Germany (in per cent).

Improvement	Stay same	Worsening	Σ
<input type="text"/>	<input type="text"/>	<input type="text"/>	100%

2c. The probability of a negative GDP growth in Germany (quarterly growth of the seasonally adjusted real GDP) will be:

current quarter: per centnext quarter: per cent

3. In the medium-term (6 months) the macroeconomic annual inflation rate will

	increase	not change	decrease	no estimate
Eurozone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Germany	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
China	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. In the medium-term (6 months) short-term interest rates (3-month interbank rates) will

	increase	not change	decrease	no estimate
Eurozone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
China	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. In the medium-term long-term interest rates (yields on 10-year bonds) will

	increase	not change	decrease	no estimate
Germany	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
China	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6a. In the medium-term (6 month) the following stock market indices will

	increase	not change	decrease	no estimate
EURO-STOXX 50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DAX (Germany)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dow Jones (USA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SSE Composite (China)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6b. Six month ahead, I expect the DAX to stand at points. With a probability of 90 per cent the DAX will then range between and points.

6c. In view of the fundamentals of the DAX companies the DAX is currently

over-priced ☐ fairly priced ☐ under-priced ☐

7. In the medium-term (6 months) the following currencies compared to the Euro will

	stay appreciate	constant	depreciate	no estimate
US-Dollar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yuan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. In the medium-term the profit situation of German companies in the following sectors will

	improve	not change	worsen	no estimate
Banks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicles/Automotive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemicals/Pharma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steel/Metal Products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electronics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Machinery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consumption/Trade	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Construction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Telecommunications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inform.-Technologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 3: The fixed part of the current questionnaire.

state (e.g. “normal” or “not change”), a bad state (e.g. “bad” or “worsen”), and the option to express that one does not know or does not want to answer (e.g. “no estimate”). A typical question of this type is (Question 2a of the April 2021 questionnaire):

In the medium-term (6 months), the overall macroeconomic situation will

	improve	not change	worsen	no estimate
Eurozone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Germany	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
China	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

In question 2a, the participants are asked to form expectations for the “overall macroeconomic situation” six months ahead for the Eurozone, Germany, the United States, and China. They are requested to express their expectations using one of the three directional categories “improve”, “not change”, and “worsen”. The question on the “profit situation of German companies” (question 8) uses exactly the same three categories regarding the six-months-ahead expectations on the profit situation for 13 sectors of the German economy. The “overall macroeconomic situation” is not defined regarding the gross domestic product (GDP) but is a more holistic term. It will certainly comprise GDP, but also other important aspects of the economy as for example the labor market or social stability. Our own experiences show, however, that expectations on the “overall macroeconomic situation” are highly correlated with GDP growth and annual changes of the industrial production.

Very similar types of formulations applying the three categories “increase”, “not change”, and “decrease” are used in questions 3 (inflation), 4 (short-term interest rates), 5 (long-term interest rates), and 6a (stock market indices). These questions ask for the six-month-ahead expectations of the respective macroeconomic or financial factors. Question 7 asks for the expected change of the value of the euro against US dollar and Chinese yuan applying the categories “appreciate”, “stay constant”, and “depreciate”, also with a horizon of six months ahead.

Question 1 requires an assessment of the currently existing “overall macroeconomic situation”. As explained above, the “overall macroeconomic situation” is not defined with regard to GDP but is a more comprehensive term. With regard

to the “overall macroeconomic situation”, the panel participants are asked to give their evaluation using the three categories “good”, “normal”, or “bad”.

There are four (sub-)questions in the regular monthly questionnaire (2b, 2c, 6b, and 6c) that ask for different types of quantitative answers. In question 2b, the participants are required to give a probability distribution regarding the future development of the macroeconomic situation in Germany. As usual, the time horizon is the next six months. The respondents shall assess probabilities for the three possible states “improvement”, “stay same”, and “worsening”.³ Question 2c refers to future GDP growth. The respondents are asked to indicate the probabilities of a negative quarter-to-quarter GDP growth for the current quarter and the next quarter.

Question 6b asks for point and interval forecasts for the DAX in six months’ time. The participants are asked to provide an expected value. In addition, we ask for a 90 per cent confidence interval for the expected future DAX value. The interval is not restricted to be symmetric. Question 6c asks for the evaluation of the current pricing of the DAX (Deutscher Aktienindex). The participants shall give their assessment of the current DAX level relative to the fundamentals of the DAX companies. The three categories they can use are “over-priced”, “fairly priced”, and “under-priced”.

In addition to these regular monthly questions there are also two sets of special questions which are asked quarterly. Both are shown in Figure 4. In the first month of every quarter, a question is asked on the medium- and long-term growth of German GDP. The special question on GDP consists of two parts. In part one, we ask for the quarter-to-quarter growth for the current and the next three quarters, and for the annual growth rate for the current and the following two years. In part two, we ask for the relevance of several pre-defined factors as drivers for changes in the GDP forecasts.

In the second month of every quarter, the questions are on the medium- and long-term development of inflation in the Eurozone and on monetary policy. The special question on inflation first asks for the annual inflation rate in the Eurozone in the current and the next two years. We then ask for the relevance of several pre-defined factors as drivers for changes in the inflation forecasts. The third part of this section is on the forecast of the main refinancing facility of the ECB with horizons of six months and twenty-four months.

³ The sum of the probabilities has to sum up to 100 per cent.

Special question: Short and medium term economic growth**1. Point forecast of the growth rate of the German GDP:**

For the quarterly values, please indicate non-annualized quarterly real & seasonally adjusted GDP growth. For the yearly values, please indicate the annual real GDP growth rate.

Quarter	2021Q3	2021Q4	2022Q1	2022Q2
Forecast	_____ %	_____ %	_____ %	_____ %
Year	2021	2022	2023	
Forecast	_____ %	_____ %	_____ %	

2. Which developments have led you to change your assessment of the business cycle outlook for the German economy? If they made you change your assessment, did they make you revise your assessment up (+) or down (-)?

	++	+	0	-	--	No answer.
a) Economic developments in Germany	[]	[]	[]	[]	[]	[]
b) Export markets	[]	[]	[]	[]	[]	[]
c) Exchange rates (relative to the Euro)	[]	[]	[]	[]	[]	[]
e) International trade disputes	[]	[]	[]	[]	[]	[]
f) ECB monetary policy	[]	[]	[]	[]	[]	[]
g) US monetary policy	[]	[]	[]	[]	[]	[]
h) The Corona pandemic	[]	[]	[]	[]	[]	[]
i) International supply chain bottlenecks	[]	[]	[]	[]	[]	[]
j) _____	[]	[]	[]	[]	[]	[]

(a)

Figure 4: Examples of quarterly special questions on GDP, inflation, and the ECB's main refinancing rate.

Special question: Inflation, forecasts and monetary policy

1. Point forecast of the annual inflation rate in the Euro area (expected percentage change in the average annual growth rate of the HICP):

Year	2021	2022	2023
Forecast	%	%	%

2. Did developments in the following areas make you change your inflation forecasts for the Eurozone (relative to February 2021)? If yes, did you revise them up (+) or down (-)?

	++	+	kein Einfluss	-	--	keine Ang.
Eurozone economic growth	[]	[]	[]	[]	[]	[]
Eurozone wages	[]	[]	[]	[]	[]	[]
Commodity prices	[]	[]	[]	[]	[]	[]
Exchange rates (relative to the Euro)	[]	[]	[]	[]	[]	[]
ECB monetary policy	[]	[]	[]	[]	[]	[]
International trade disputes	[]	[]	[]	[]	[]	[]
Brexit	[]	[]	[]	[]	[]	[]
The Corona pandemic	[]	[]	[]	[]	[]	[]
	[]	[]	[]	[]	[]	[]

3. Forecast of the ECB's **main refinancing operations rate** (0,00% as of May 3, 2021), central 90 percent confidence interval:

In 6 months between [] and [] percent
 In 24 months between [] and [] percent

(b)

Figure 4: Continued.

4 Research Using the ZEW FMS Dataset

Since the launch of the FMS, ZEW Mannheim has systematically collected the survey responses and has offered the continuously growing database to academic researchers. The ZEW FMS data have been increasingly used in academic studies beginning in the mid-1990s. This section provides an overview of the main topics of these studies and describes how the data have been used. The most recent list of studies can be found under https://ftp.zew.de/pub/zew-docs/div/Liste_der_Veroeffentlichungen.pdf.

As of September 2021, we are aware of 53 publications using data from the ZEW FMS. These studies can be broadly classified into two groups. In the first group, ZEW FMS variables are used as input variables to econometric models. Here one can distinguish between two use cases. The first use case is

the use of ZEW FMS variables as predictors in a forecasting exercise. The second use case is the use of a ZEW FMS variable as a control variable.

The second group of papers studies how financial market experts form their expectations of different macroeconomic and financial variables, many of which are on behavioral finance topics. Table 1 provides more details on the distribution of papers across topics:

4.1 Using ZEW Variables in Forecasting Exercises

Are the expectations collected by the ZEW Financial Market Survey useful to forecast the future value of selected target variables? The papers outlined in this section examine the predictive performance of different expectation series of the ZEW FMS.

Five papers are primarily interested in business cycle forecasting. Benner and Meier (2004), Breitung and Jagodzinski (2001), Hüfner and Schröder (2002a, 2002b) investigate the forecasting performance of the ZEW Economic Expectations and other leading indicators for Germany, whereas Carstensen et al. (2011) focus on the euro area.

Hüfner and Schröder (2002a, 2002b) concentrate on the forecast performance evaluation of the IFO business cycle expectations and the ZEW Economic

Table 1: Which are the main topics the publications deal with?

Topics	Number of publications
Forecasting	
Business cycle	9
Exchange rates (in most cases: USD/EUR)	5
Inflation	4
Other	5
ZEW FMS variables as control variables (future economic situation, inflation, interest rates, DAX)	8
Expectation formation	
Stocks (e.g. DAX)	11
Exchange rates (in most cases: USD/EUR)	9
Inflation	6
Interest rates	4
Business cycle	2

Expectations index for predicting the future change in the German industrial production index. Benner and Meier (2004) also take the IFO and the ZEW expectations indices and additionally analyse the “Earlybird” indicator of the journal *Wirtschaftswoche*. Going beyond Huefner and Schröder, Benner and Meier also determine the model recursively, and not only the forecasts. Carstensen et al. (2011) compare the forecast performance of seven indicators for the industrial production in the euro area. The indicators are, for example, the OECD composite leading indicator, the European Sentiment Indicator (ESI), the FAZ Euro Indicator, and the ZEW Economic Expectations index.

Four publications examine the forecast performance of exchange rate expectations. These are Bofinger and Schmidt (2003), Dick et al. (2015), Leitner and Schmidt (2006), and MacDonald et al. (2009). Bofinger and Schmidt (2003) and Leitner and Schmidt (2006) take the aggregated USD/EUR expectations of the ZEW FMS and assess the forecast performance for the future USD/EUR exchange rate. Dick et al. (2015) and MacDonald et al. (2009) use the microdata, i.e. the expectations on the individual level and try to find out, why some forecasters are better than others. They conclude, *inter alia*, that persons with a superior forecast performance for exchange rate fundamentals are also better in forecasting exchange rates.

Another four studies concentrate on stock and bond markets. Entorf and Steiner (2007), Entorf et al. (2012), and Hess and Niessen (2010) examine whether a new release of the ZEW Economic Expectations index has impact on capital markets in Germany. Entorf and Steiner (2007) use high-frequency data for the Xetra DAX and estimate the market impact of the release of the ZEW index. This analysis is extended to the impact of the IFO Business Climate index in Entorf et al. (2012). Hess and Niessen (2010) investigate the impact of ZEW and IFO index on the German bund futures market in the context of a Bayesian learning model using high-frequency data. Schmeling and Schrimpf (2011) examine the predictive power of inflation expectations on future stock returns for France, Germany, Italy, Japan, the US, and the UK. For all six countries, expected inflation is measured by the inflation expectations from the ZEW FMS.

One paper (Krüger et al. 2011) assesses the forecast performance of the ZEW expectations for the short-term interest rates in the euro area for the future EURIBOR. This paper uses the Carlson and Parkin (1975) method to estimate quantitative short-term interest forecasts using the qualitative expectations of the ZEW FMS.⁴ In Krüger et al. (2011), the quantified EURIBOR

⁴ The Carlson and Parkin method uses in our context the relative shares of the three categories of the ZEW FMS data, namely “increase”, “stay the same”, and “decrease” and assumes a normal

survey forecasts are combined with forecasts from a time series model applying a time-varying weighting scheme. Scheufele (2011) uses the quantified ZEW inflation expectations to forecast consumer price inflation. He finds, *inter alia*, that the inflation expectations, when added to forecasting models, improves forecast accuracy.

There are three studies which are primarily methodologically oriented. Nolte and Pohlmeier (2007) test the forecasting performance of traditional time series methods and compare them with the results using different quantification methods applied to the qualitative expectations from the ZEW FMS. They make use of the following data from the survey (for the period December 1991 until April 2004): German, US and Japanese inflation rates; German, US, and Japanese short-term interest rates; DAX index, Dow Jones Industrial Index, Nikkei 225 Index, FTSE 100 Index, CAC 40 Index; the USD/EUR and the GBP/EUR exchange rate. Mokinski (2016) develops a nowcasting model with the aim to estimate the (latent) daily responses using the irregularly distributed responses within the monthly survey interval. This is possible because the time stamps (i.e. the time of arrival) of the individual responses are available. The results are interesting for improving event studies based on the individual responses of the ZEW FMS. Fastrich and Winker (2014) use a portfolio-based approach to improve the point forecasts of the ZEW FMS participants regarding the DAX30 index. The authors construct forecast-portfolios in which the analysts are like “assets” with specific characteristics that are used to form the portfolios. The results show, for example, that the forecast-portfolios exhibit smaller forecast errors compared to the most successful single forecaster on horizons smaller than six months.

4.2 Expectation Formation

Twenty papers use data from the ZEW FMS to analyze expectation formation. Many of these studies examine specific behavioral finance topics like overconfidence, the effect of framing on expectations, herding behavior or differences between “chartists” and “fundamentalists”. Three papers are concerned with the effect of monetary policy on inflation expectations.

The earlier studies like Marnet (1996), König et al. (1998, 1999), and Szczesny et al. (1997), are using the the expectations only in form of aggregates. Almost all of

distribution for the underlying continuous variable. As a result, a quantitative future value for the EURIBOR is estimated based on the original qualitative expectations.

the other, more recent, papers use the expectations data of the ZEW FMS on the individual level, i.e. the individual responses to the questions of the survey.

Seven of the papers focus on stock expectations and in particular the expectations on the German DAX. Deaves et al. (2010) is the first paper to use the DAX point and interval forecasts. Since mid-2003, the regular questionnaire of the ZEW FMS has asked for the six-month-ahead forecast of the DAX index and a 90 per cent confidence interval for the point forecast. Deaves et al. (2010) and Deaves et al. (2019) use these data for analyzing the statics and dynamics of overconfidence and for the effect of overconfidence on the ability to forecast future stock returns. In Deaves et al. (2021), the DAX point forecasts are combined with the responses on the question regarding the fundamental value of the DAX ("Is the DAX currently overpriced, fairly priced, or underpriced?"). Using these data the study investigates whether the survey respondents believe in stock market efficiency. Brückbauer (2020) examines how the DAX expectations, in particular the DAX point forecasts, are formed. He uses not only DAX point forecasts, but also the qualitative expectations on the DAX, the future economic situation in Germany, inflation, and short- and long-term interest rates. He investigates which factors drive the variation in expected DAX returns and he also evaluates the precision of DAX return forecasts. Hoffmann et al. (2017) take the DAX point forecasts and investigate if the DAX returns the respondents witnessed in the past influence how they form expectations on the future DAX. As control variables they use (qualitative) expectations from the ZEW FMS on the economic situation. They make also use of personal characteristics of the respondents like gender, age, and year of career start.

Breitung and Schmeling (2013) focus on methods which are used to quantify qualitative survey data, for example the Carlson and Parkin (1975) method and more flexible methods with time-varying parameters. The authors use DAX point forecasts and qualitative DAX expectations to evaluate different econometric procedures to quantify the qualitative DAX expectations. The comparison of the quantified qualitative expectations with the quantitative DAX forecasts (from the same respondents and for the same time horizon) makes it possible to analyze the characteristics of the quantification procedures in greater detail.

The paper of Rangvid et al. (2009) focuses on so called "higher-order expectations". If higher-order expectations persist in a market, an investor does not only invest in those assets they prefer as best performing assets, but also takes into account what other investors will choose to invest in. They will also take into account that other investors will act in the same way (see Rangvid et al. (2009: 2)). In their study, the authors try to differentiate the hypothesis of higher-order expectations from the hypothesis of herding

behavior. Their study is based on the qualitative expectations from the ZEW FMS on the stock markets of France, Germany, Italy, Japan, the US, and the UK.

A paper that also deals with herding is Lux (2009). The author focuses on the response behavior for the question on the future economic situation in Germany. He uses neither the individual data nor the aggregate indices but the ratio of replies for the three categories “increase”, “no change”, and “decrease”. The author uses a stochastic dynamic model on social interaction and finds that the respondents of the ZEW FMS show a strong tendency to follow the opinion of their peers.

Another seven papers deal with the expectations on exchange rates.⁵ The majority of these papers investigate the expectations on the USD/EUR exchange rate, for earlier periods also on the USD/DM exchange rate. One of the older publications, Schröder and Dornau (2002), investigates whether the respondents have structural economic exchange rate models (flexible- or sticky-price model, Mundell Fleming model) in mind when forming expectations on exchange rates, future economic conditions, inflation, and interest rates.

Menkhoff and Rebitzky (2008) estimate the long-term relationships between USD/EUR expectations and (relative) prices and investigate how deviations from long-run purchasing power parity (PPP) are reflected in the exchange rate expectations. Whereas this paper uses the expectations index, the individual responses are the main data source for Menkhoff et al. (2008). In this second study, the authors investigate if and how strongly the two groups of “chartists” and “fundamentalists” are driven by the PPP model in contrast to so called technical forecasting models. They find, inter alia, that fundamentalists believe too much in mean reversion, which leads to a poor forecasting performance, whereas “chartists” rely too much on extrapolating short-term trends.

Menkhoff et al. (2009) examine the sources of heterogeneity in exchange rate expectations for USD/EUR GBP/EUR, and JPY/EUR applying the chartist-fundamentalist model. Some of the findings are that heterogeneity decreases when exchange rates deviate relatively strongly from their fundamentals, the group of fundamentalists expects a mean-reverting exchange rate behavior. Strong movements in the exchange rates lead fundamentalists to shift temporarily into the group of chartists.

Dick and Menkhoff (2013) investigate the different behaviors of chartists and fundamentalist for the USD/EUR in more detail. They make use of the individual USD/EUR expectations from the ZEW FMS and combine this dataset

⁵ The publication of König et al. (1998) on the USD/DM expectations has already been mentioned at the beginning of this section and is therefore not further discussed here.

with the answers to a special question in which the participants had been asked for a self-assessment regarding the use of charts and fundamentals. They find, *inter alia*, that the choice of forecasting tools is influenced by recent experience: when exchange rates exhibit trends, the respondents tend to switch toward Chartism; in contrast, they move away from Chartism when the exchange rate deviates substantially from its longer-term average.

Gloede and Menkhoff (2014) deal with the USD/DM and USD/EUR expectations and investigate the overconfidence of the respondents. In addition to the regular ZEW FMS data, they make use of responses to special question regarding a self-assessment on how strong they see their own forecasting precision compared to the average of all survey participants. To account for person-specific characteristic Gloede and Menkhoff (2014) include data on gender, age, and job function into their analysis. They find that high overconfidence goes along with a high self-rating and a low forecasting performance.

Glaser et al. (2019) study the so called framing effect. In particular, the authors investigate in three sub-studies if professional forecasters think of asset prices and asset returns in the same way. In the third sub-study data from an experiment, conducted within the ZEW FMS, are used. This survey experiment consisted of 12 waves between September 2012 and June 2015. The respondents received an additional questionnaire to collect the data needed for the experiment. One main result of the paper is that it actually significantly matters if forecasters are asked to form expectations on prices or on returns.

5 Data Access

ZEW Mannheim provides academic researchers free access to the anonymized ZEW FMS micro data. There are no restrictions with respect to research topics. The ZEW FMS research dataset is offered through the research data center ZEW-FDZ. To request access to the ZEW FMS data, interested researchers shall send an email to fdz@zew.de, including:

- The research topic.
- The requested parts of the research dataset (see the information on the ZEW FMS research dataset below).

Based on this information, ZEW Mannheim will prepare a data usage agreement, which will have to be signed by the interested researcher or the research institution they are working in. A template of the data usage agreement can

be found under <https://kooperationen.zew.de/en/zew-fdz/provided-data/zew-financial-market-test>. After the data usage agreement is signed by both parties, ZEW Mannheim will provide electronic access to the ZEW FMS research dataset.

The ZEW FMS research dataset consists of five Stata files.⁶ These include (1) information on survey waves, (2) static information on panel members, (3) static information on panel members' employers, (4) dynamic information of panel members and (5) the results of the ZEW FMS. The appendix of Brückbauer and Schröder (2021) details the content of these files. The variables in the files as well as their values are labeled.

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⁶ Other formats are available on request.

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