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Theories, techniques and the formation of German business cycle forecasts: Evidence from a survey of professional forecasters

Jörg Döpke*, Ulrich Fritsche†, Gabi Waldhof‡

March 1, 2018

Abstract

We report results of a survey among active forecasters of the German business cycle. Using data for 82 respondents from 37 different institutions, we investigate what models and theories forecasters subscribe to and find that they are pronounced conservative in the sense, that they overwhelmingly rely on methods and theories that have been well-established for a long time, while more recent approaches are relatively unimportant for the practice of business cycle forecasting. DSGE models are mostly used in public institutions. In line with findings in the literature there are tendencies of “leaning towards consensus” (especially for public institutions) and “sticky adjustment of forecasts” with regard to new information. We find little evidence that the behaviour of forecasters has changed fundamentally since the *Great Recession* but there are signs that forecast errors are evaluated more carefully. Also, a stable relationship between preferred theories and methods and forecast accuracy cannot be established. (150 words)

Keywords: Forecast error evaluation, questionnaire, survey, business cycle forecast, professional forecaster

JEL classification: E32, E37, C83

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1 Introduction

Ever since the invention of economic forecasting as a business it attracts public attention (Friedman, 2014; FAZ, 2016; Nienhaus, 2009). Knowledge, however, on the formation of business cycle forecasts is rare. This is astonishing given the high importance of expectations in modern macroeconomic theory.

Policy-relevant institutions as ECB or the Federal Reserve System in the U.S. but also private firms like “Consensus Economics” regularly poll forecasters on how economically educated actors form their expectations of future macroeconomic development. Arguably, professional forecasters seem to play a prominent role in shaping society’s expectations on economic issues. Rational inattention models (Sims, 1998, 2003; Woodford, 2002; Maćkowiak and Wiederholt, 2009) as well as models of sticky information (Mankiw, 2006) received a lot of interest in the last couple of years in macroeconomics and imply a role for professional forecasters. Carroll (2003) implicitly assumes a sticky information environment and delivers a model based on “epidemiology” (= informedness as a passive disease infection) to model the trickle-down of information flows from highly informed experts to the general public. Coibion and Gorodnichenko (2015) argue that the dynamics of expectation formation and the updating of expectations as observed in survey data are in line with “rational inattention” models. Furthermore, the turmoil of the recent financial crisis and the deep recession in its aftermath brought economists, economic models and forecasters under harsh criticism.

Our paper contributes to understanding the work of the “fortune tellers” (Friedman, 2014). Our goal is to answer some questions about the motivation and organization of the forecasting process and to identify theories/ models behind macroeconomic forecasting in Germany. For this purpose, we conducted an online-survey among professional forecasters which are all producing forecasts for the German economy – either in public or private institutions in Germany or in supranational or international organizations outside Germany.¹

The paper relates to an existing strand of literature using surveys among professional forecasters. Batchelor and Dua (1990a,b) analyse, how divergent theories and models are across different forecasting institutions and ask, whether forecasting accuracy depends on these differences. To make a long story short, the authors of these previous studies do not find a strong impact of theoretical positions and forecasting techniques on the accuracy of the forecasts². In a similar vein, Ashiya (2006) cannot find a respective connection based on Japanese data. The European Central Bank (2009, 2014) has conducted special surveys among participants of the regular “Survey of Professional Forecasters”. The results confirm a great importance of judgemental forecasting as opposed to model based forecasting (Fildes and Stekler, 2002; Lawrence et al., 2006). Furthermore, they find a very low “relative weight” of use of modern macroeconomic (i.e. DSGE) models, which contrasts to the high academic importance of these models (Wieland and Wolters, 2013; Del Negro and Schorfheide, 2013). In a similar vein, Stark (2013) presents results based on a special survey among the U.S. “Survey of Professional Forecasters”. According to his results, forecasters use a combination of methods with a high degree of judgemental methods. Again, models, that are arguably a little old-fashioned but robust – like traditional IS/LM models – , are still of great relative importance for the forecaster’s tool box (Krugman, 2000).

The paper is also related to another strand of literature which employs observed forecasts and respective errors to test hypotheses about forecast properties and the behaviour of forecasters, namely unbiasedness and efficiency of macroeconomic forecasts (Fildes and Stekler, 2002), information rigidities and “leaning towards consensus” (Dovern et al., 2014; Coibion and Gorodnichenko, 2015) behaviour. Several paper as Wang and Lee (2014) or Döpke et al. (2017) started to inves-

¹We concentrated our efforts on institutions based in Germany and surveyed only some forecasters in international organizations producing forecasts for the German economy.

²In this paper, we refer to a rather pragmatic understanding of business cycle forecasts. As Heilemann (2012) points out, most of the forecasts are not business cycle forecasts in the sense that the full cyclical development is anticipated, but short run forecasts for the next 1-2 years.

tigate some of those topics for the period after the *Great Recession*. However, to the best of our knowledge, those issues have not been investigated using a questionnaire and asking forecasters directly.

Our paper adds to this literature by investigating the following issues by surveying the forecasters:

- Which models and theories do forecasters subscribe to?
- Do theories differ when it comes to forecasting in contrast to general beliefs about how the economy works?
- Has the behaviour of forecasters changed since the *Great Recession*?
- Do forecasters use different models now than a decade ago?
- Is there a relationship between theories/ models and forecast accuracy?
- What about “leaning towards consensus”, herding, inefficient information processing or changes in risk-aversion/ attitudes/ loss function and respective behavioural changes after the *Great Recession*?

Briefly summarizing our results, we are not able to establish a direct link between forecast accuracy and theories and methods. In line with former studies we find that practitioners tend to be hesitant in adopting methods that are currently championed by the academic discussion. There are signs that the younger generation seems to be more open to non-linear forecasting tools and machine-learning-based methods. We find that forecasters are conservative in the sense, that they overwhelmingly rely on methods and theories that have been well-established for a long time, while more recent approaches are relatively unimportant for the practice of business cycle forecasting. The academic evaluation of publicly funded research institutes (*Leibniz institutes*)³ seems to have changed this to some extent as DSGE models are significantly more often used in public institutions. This could indicate a social-desirability phenomenon in the selection of methods as academic excellence over the last decade became a fundamental criterion for the funding of public economic research institutes in Germany (Bertrand and Mullainathan, 2001; Ketzler and Zimmermann, 2013). However, for all forecasters there is self-reported evidence for a “leaning-towards-consensus” attitude (especially among forecasters in public institutions) a tendency of inefficient information processing. Interestingly, even if we find almost no evidence that the (self-reported) behaviour of forecasters has changed substantially since the *Great Recession*, the awareness to evaluate forecasts on a regular base seems to be higher after the crisis. Furthermore individual statements given in the open answer categories indicate, that “experience”, “personal forecasting experience”, “experience based knowledge”, or “historical experience” were all given as important elements of the forecasting efforts. This implies that the topic “how experience shapes expectations” is somewhat present among forecasters and a relation to “personal/ historical experience” is established by some individuals.

The paper is organized as follows: Section 2 describes the data set. In Section 3 we present the empirical analysis with respect to the questions raised above. Section 4 discusses the result and summarizes. Further details about the questionnaire can be found in the appendix sections.

³Following the advice of Wissenschaftsrat (1998), the research institutes have undergone a pronounced overhaul after 1998, which has – inter alia – led to a much stronger orientation towards the academic publication record (Ketzler and Zimmermann, 2013)

2 Data

2.1 The statistical population

To define the statistical population of our investigation we have to clarify what we understand as the kind of "forecaster" we are interested in. We identified the following criteria to define the group we are aiming at:

- The institution is based in Germany and provides forecasts *for the German economy*.
- The forecasts *are of quantitative nature*, i.e. at least a prediction for real GDP growth is provided. For example, this criterion rules out, associations, which comment on the current economic situation, but don't provide numbers. Also, some commentators on economic policy with a more heterodox theoretical background, such as the Arbeitsgruppe alternative Wirtschaftspolitik (Memorandum-Gruppe) (2016) do not match this criterion.
- The forecast is a *macroeconomic* forecast, i.e. we exclude institutions that provide forecasts for individual sectors, branches, or regions only from our sample. For example, neither BITKOM - Germany's digital association (2016), which provides forecasts for the IT branch only, nor the Niedersächsisches Institut für Wirtschaftsforschung (NIW) (2016), which provides forecasts for only one German state, are part of our sample.
- The institution forecasts on a regular basis. This criterion excludes some individuals, which have been credited for foreseeing the financial crisis like, e.g. Otte (2011).
- We refer to short-run, i.e. mostly to one-year-ahead or at best two-year-ahead forecasts. In other words, the forecasts have to be made at least at annual frequency and refer to the economic situation in the coming period.
- We refer to forecasts that are — at least in part — offered as a public good. Some institutions provide a detailed explanation of the forecasts only for their customers, but are counted in public rankings with their "headline" numbers of, say, real GDP growth. Our net-based search strategy, however, will miss firms that provides their forecasts exclusively for their customers, although we are not aware of such a firm. Generally, since media coverage is arguably very important as a marketing tool, we are quite confident that we have not missed an important part of the forecasting industry.
- In contrast to previous studies, our basic statistical unit are not the forecasting institutions, but the individual forecasters. This renders it possible to collect information over forecasting processes, the motivations of forecasters and the like.
- We refer to currently active forecasters.⁴

Relying on publicly available information we have identified 266 persons that might work on forecasts for the German economy on a regular basis. We have taken into account institutions that have been listed in the ranking of Fricke (2016) and the regular reports of Consensus ForecastTM (2016). Some information we have collected from several web-pages the internet appeared to be misleading: in some cases the mails have been undeliverable, in some cases automatic response mails indicated a long term absence of the person and some colleagues informed us that they are nor in charge of forecasting the German economy. A complete list of all institutions, to which we have sent at least one invitation email is provided in the appendix. Table 1 gives the quantitative overview over the responses. The response rates were 34 %, for the contacted persons, and 67 % for the listed institutions, which are sufficiently high response rates for an online survey. To protect the anonymity of the respondents, we keep the groups rather broad and distinguish four of them:

⁴We have asked retired forecasters and individuals, who are still active as economist, but not as a forecaster for comments on a pre-test version of the questionnaire.

Table 1: Response rate to the survey

Number of E-Mails sent	266
Number of E-Mails undeliverable	-12
Number of responses "not appropriate"	-17
Number of long-term absences	-1
Number of remaining invitations	237
Number of responses	81
Number of responses (complete survey)	56
Response rate (persons)	34%
Response rate (persons, complete)	24%
Response rate (institutions)	67%

- Publicly financed institutes,
- Privately financed institutes,
- Government, central banks, international institutions, and institutions of policy advice,
- Private firms and associations.

2.2 The questionnaire

The final version of the questionnaire consisted of nine parts with a total of 24 questions. With this, we designed a comprehensive and exploratory questionnaire that makes use of different methodologies for data collection. Consequently, the questions differ in complexity and estimated response time. Depending on which seemed most appropriate for a particular question, we included Likert scales, list boxes and free-text questions.

More specifically, we asked participants about models used for forecasting and theories they subscribe to hold which may both influence the forecast and the forecasting process, and asked them quantitative assessment questions aiming at their macroeconomic beliefs. Furthermore, we addressed questions related to forecasting teams, forecast errors, and potential adjustments that may have been made after the *Great Recession*. We were also interested in potential herding behaviour and risk management of forecasting teams, which we will explain later on. Additionally, we asked about the individual forecaster's motivation for choosing economic forecasting as their profession. In the last section, we collected demographic data. Finally, participants were given the opportunity to comment on the questionnaires and leave their suggestions.

All questions (in English⁵) can be found in appendix section B. The survey was conducted as an on-line survey using Limesurvey (LimeSurvey Project Team / Carsten Schmitz, 2017) from January 23rd 2017 to March 6th 2017 (last answer recorded). All possible participants have been invited to take part by email on January 23rd 2017. Those who had not answered until then were reminded on February 2nd 2017. We also run a pre-test of the survey among a group of retired forecasters and persons that are still working, but have left the field of macroeconomic forecasting.

3 Empirical results

3.1 Demographic statistics

Table 2 gives some information about the survey respondents. While the median age is not astonishing, the median length of work experience gives some food for thought. The cyclical peak before the *Great Recession* is usually dated in 2007. This implies that roughly half of the forecasters today

⁵Participants had the choice to answer in German or English.

has no on-the-job experience with a (pronounced) recession. This leads to the question, whether some institutionally embedded experience exists, for example, in the form of experienced colleagues that might share their memories from the last cyclical downturn (and upswing).

Table 2: Some demographic information

	n	
Median age of respondent	43	49 [37; 52.5]
Median years experience as a forecaster	50	10 [5; 18]
Share of female forecasters	54	13%
Academic degree or position	56	Diplom: 9
		Master of Science: 4
		Dr.: 39
		Professor: 3
Field of studies	57	Other: 1
		Economics: 53
		Mathematics: 1
Group of institutions	81	Others: 2
		Public institutes: 18
		Private institutes: 12
		Policy related institutions: 19
		Private firms: 31

In brackets: 25 % and 75 % quartiles.

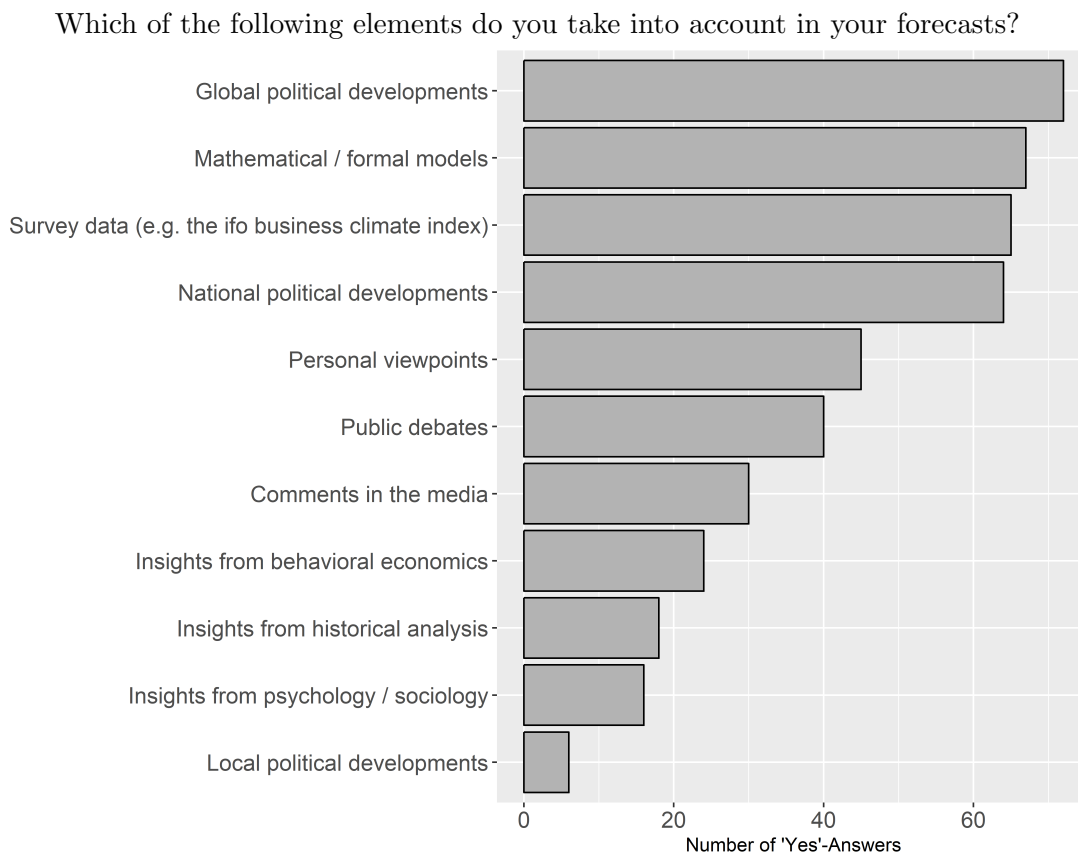
The forecasting industry seems to be “a man’s world”: The share of female forecasters is low in comparison to the share of women holding a degree in Economics Germany. This is line with findings of Fondsfrauen (2015), a lobby group promoting women’s careers in the finance industry, which counts just 4 out of 55 institutions having a female chief economist.

Forecasters usually hold academic degrees, a majority of them received doctoral or Ph.D degrees. Practically all forecasters named economics as their main field of studies. Only one person has studied mathematics and two others choose the option “other” fields, but both have a similar field or an additional field of studies. For the moment, there doesn’t seem to be much competition for the economists in the field of macroeconomic forecasting. This might be different in related fields (finance) or, perhaps, will change in the (near) future as machine learning tools become more accepted as a forecasting tool in this area.

3.2 What theories/ -methods do forecasters use?

We start our investigation of methods and theories with a rather general question on the factors that influence a forecast. With this question we aim at seeing how strongly forecasters rely on the use of specific forecasting methodologies or information. For example, behavioural economics is a rather new approach, which makes it interesting for us to see if it has been implemented in forecasting practice yet. Furthermore, we are interested in the speed of adoption of methods discussed in the academic discourse. For example, behavioural economics is a relatively new approach, which would be interesting for us to see if it has been implemented in forecasting practice yet. The results are given in Figure 1. According to these answers, most forecasters have little eye for an interdisciplinary approach. While this is line with the results of Fourcade et al. (2015), who find that economics is much more self-orientated than neighbouring fields, it might be seen as a shortcoming, since, e.g., Tetlock and Gardner (2016) argue that it is not in particular the expertise in a certain field that makes a good forecasters, but instead a certain attitude, like being open to revise your forecast when facing new information. Insights from neighbouring fields like psychology or history are noticed only by a minority of forecasters. By contrast, factors that may be attributed to a economic viewpoint in a rather narrow sense, are named much more often. In addition to the

Figure 1: Elements of the forecasting process



Source: own survey and calculation

pre-defined items, respondents had the opportunity to write-in “other” elements of their forecasting process. The individual statements are listed in section C. This, in turn, gave interesting insights. There are some notable exceptions to the general picture: “experience”, “personal forecasting experience”, “experience based knowledge”, or “historical experience” were all given as important elements of the forecasting efforts. Furthermore, the mentioned “rule of thumb(s)” also reflect a specific form of experience as does the reflection on past forecast errors. Over and above, at least one forecaster emphasized the relevance of institutional knowledge as an element relevant for forecasting. This is important as it shows that the topic “how personal and societal experience shapes expectations” is somewhat present among forecasters and a relation to “historical experience” is established by some individuals.

Figure 2 summarizes the responses to the question about what methods are of importance for the forecasting process. The surveyed forecasters strongly rely on quite traditional methods like leading indicators, intuitive methods and the iterative national accounts related method.⁶ By contrast, some methods recently championed by the academic literature (e.g. machine learning tools, non-linear models and DSGE models) are not widely used. Again, respondents, who have chosen the option “other methods” have been asked what methods they have in mind, the answers are listed in appendix section C.

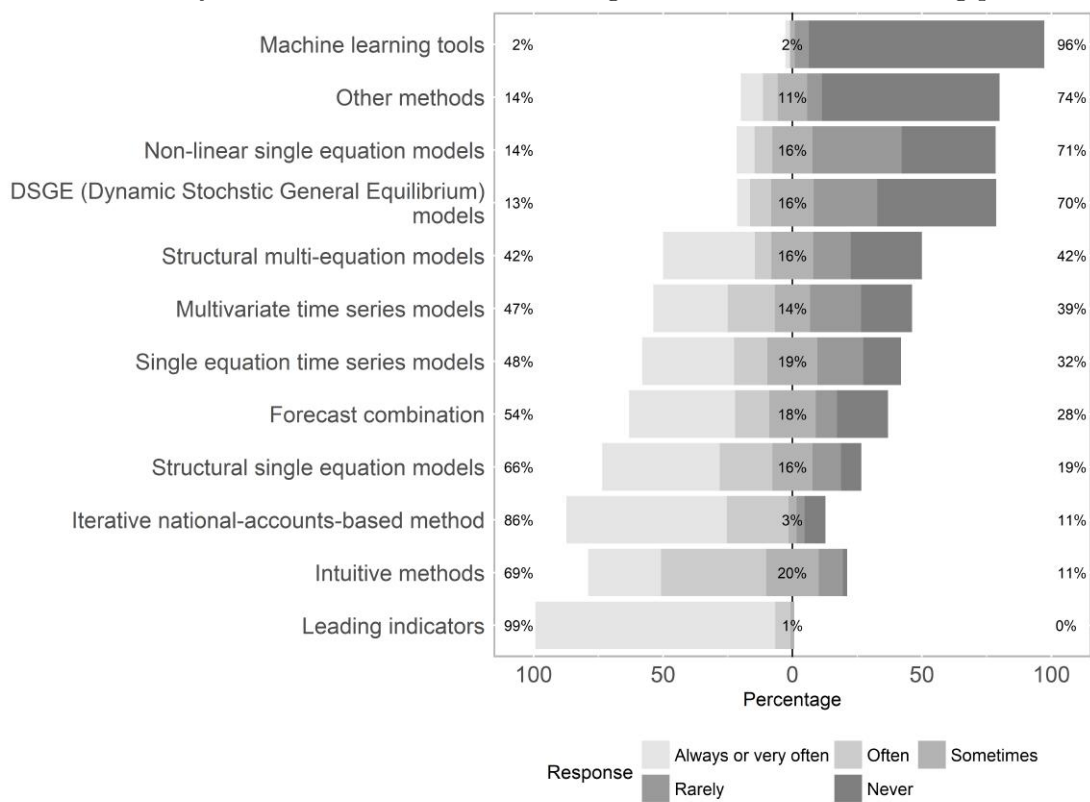
All in all, a marked difference between the recommendations of the academic literature and the practice of forecasting shines up. There is, however, evidence, that somewhat younger (below the median age) forecasters as well as forecasters employed at publicly funded research institutes⁷ tend

⁶For a description of these methods see, e.g., Döhrn (2014).

⁷The respective appendix section provides a list of institutions. We have counted the institutions listed under “private firms”, “privately financed research institutes” and “associations” as private institutions, all others as public institutions.

Figure 2: Methods used in the forecasting process

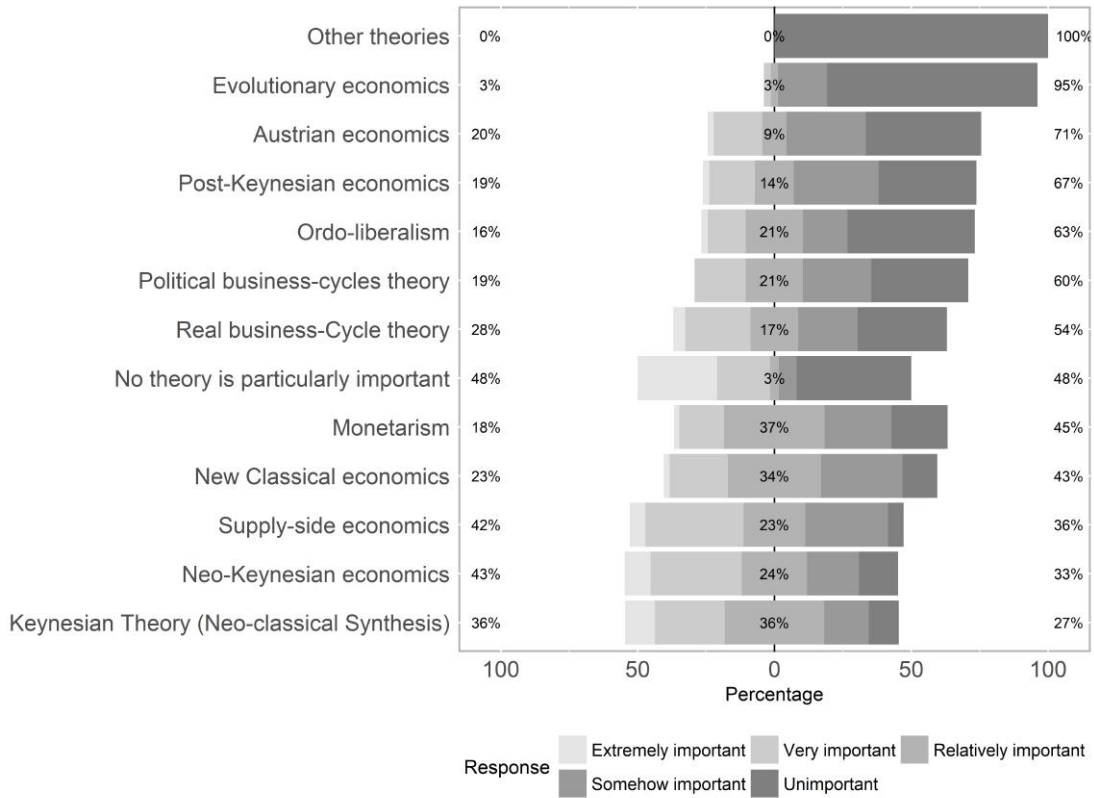
How often does your institution use the following methods in the forecasting process?



Source: own survey and calculation

Figure 3: Importance of theoretical approaches for the forecasting process

How important are the following theoretical approaches for the forecasting process in your institution?



Source: own survey and calculation

to use non-linear and DSGE-based forecasting tools more often. The results reported in Table 3 show that DSGE models are – to a very small extent – more popular among younger forecasters and are used more frequently in public institutions. The latter also holds for non-linear (e.g, Probit or Logit type of) models. The two results, however, are not completely independent from each other since younger forecasters work more often at public institutions, whereas forecasters at private institutions are — on average — somewhat older.

We also asked for the importance of particular theoretical positions in the forecasting process. The results of this task are given in Figure 3. First, the claim that no theory is particularly important for forecasting is popular among the respondents. In part, this might reflect a dominance of data-driven approaches in practical forecasting. Turning to the individual theoretical approaches, the results point to high importance of Keynesian ones, either under the more traditional header “Neoclassical Synthesis” or the modern designation “Neo-Keynesianism”. We also had two write-in answers stating additional theoretical positions that are relevant to at least one forecaster. The items can be found in the appendix section C.

We asked participants about importance of certain theories for the forecasting process, as well as about the importance of certain theories for the forecaster personally. The results differ only a little, and are reported in figure 4.

The response to this question is in line with recent claims (see, e.g., Bofinger, 2016), that Ordo-liberalism and related positions are still of relatively great importance for German economists. It seems reasonable to assume that normative comments on macroeconomic policy are merely driven by the personal beliefs of forecasters. Insofar some German forecasters may find themselves in a somewhat uncomfortable situation, since the theories, which they rely their forecasts on, are different from the theories founding their normative positions. In table 4 we tested for differences

Table 3: “Modern” methods and selected characteristics of forecasters

	Uses the method at least sometimes	Uses the method rarely or never	NA	Test for independence [p-value]	Fisher exact test [p-value]
Method and age					
DSGE models					
Older	2	14	2	[0.62]	[0.45]
Younger	6	19	0		
Probit models					
Older	5	10	3	[0.78]	[0.72]
Younger	6	19	0		
Machine learning					
Older	0	15	3	[>0.99]	[1.00]
Younger	1	22	2		
Method and nature of institution					
DSGE models					
Private	5	27	13	[0.03]	[0.02]
Public	13	16	7		
Probit models					
Private	8	22	15	[0.87]	[0.77]
Public	9	19	8		
Machine learning					
Private	0	30	15	[0.39]	[0.20]
Public	2	23	11		
Method and theoretical position					
DSGE models					
Leaning Keynesian	7	21	19	[0.88]	[0.60]
Leaning neo-classical	2	3	9		
Probit models					
Leaning Keynesian	8	19	19	[>0.99]	[0.64]
Leaning neo-classical	3	2	7		
Machine learning					
Leaning Keynesian	0	25	23	NA	[>0.99]
Leaning neo-classical	0	5	2		

Notes: p-values in brackets. Source: own survey and calculation. NA due to insufficient number of observations.

Table 4: Importance for forecasting vs. personal importance of theoretical position

Theoretical position	Importance for forecasting	Personal importance	t-test	Mann-Whitney-test
Null hypothesis: Importance is equal				
Keynesian theory (Neo-classical synthesis)	3.1	3.4	-1.18 [0.24]	1163 [0.28]
Post-Keynesian economics	2.2	2.4	-0.98 [0.33]	696.5 [0.31]
Monetarism	2.6	2.5	0.12 [0.90]	1093.5 [0.9]
Supply-side economics	3.1	3.1	-0.04 [0.97]	1214.5 [0.98]
Neo-Keynesian economics	3.0	3.2	-0.44 [0.66]	819 [0.70]
New classical economics	2.7	2.7	0.20 [0.84]	974 [0.93]
Real business-cycle theory	2.5	2.2	0.83 [0.41]	1053.5 [0.45]
Austrian economics	2.1	2.2	-0.61 [0.54]	849 [0.40]
Political business-cycle theory	2.2	2.4	-0.71 [0.48]	878 [0.48]
Evolutionary economics	1.3	1.7	-1.81 [0.07]	609 [0.14]
Ordo-liberalism	2.1	2.4	-1.21 [0.23]	716 [0.24]

Notes: The Likert-scale is recoded from 5 ("Extremely important") to 1 ("Unimportant"). p-values in brackets. Source: own survey and calculation.

between "importance for forecasting" and "personal importance" for different groups. Generally, Keynesian and Neo-Keynesian approaches seem to be important both for forecasting and personally, but also supply-side economics. Differences between the two points of view are rare. Only in case of "Evolutionary economics" we find a significant difference at usual levels. "Monetarism" and "Real business cycle theory" are the only cases where the importance for forecasting is on average higher than the personal importance.

Last but not least, in table 5 we report results for testing the hypotheses that an individual preference for a specific school of thought does neither depend on age nor on the nature of the institution. Interestingly for most of the answer categories there are no significant differences. Exceptions are the schools of "Monetarism", "Austrian economics" and "Political business cycles" for which the null of no differences with regard to age is rejected and "Post-Keynesian economics" for which the rejection of the no-difference hypothesis is possible with respect to differences in institutional affiliations. That points to cohort effects with respect to the framing of ideological positions similar to the cohort effects of shaping beliefs observed in expectation data for the general public (Malmendier and Nagel, 2016).

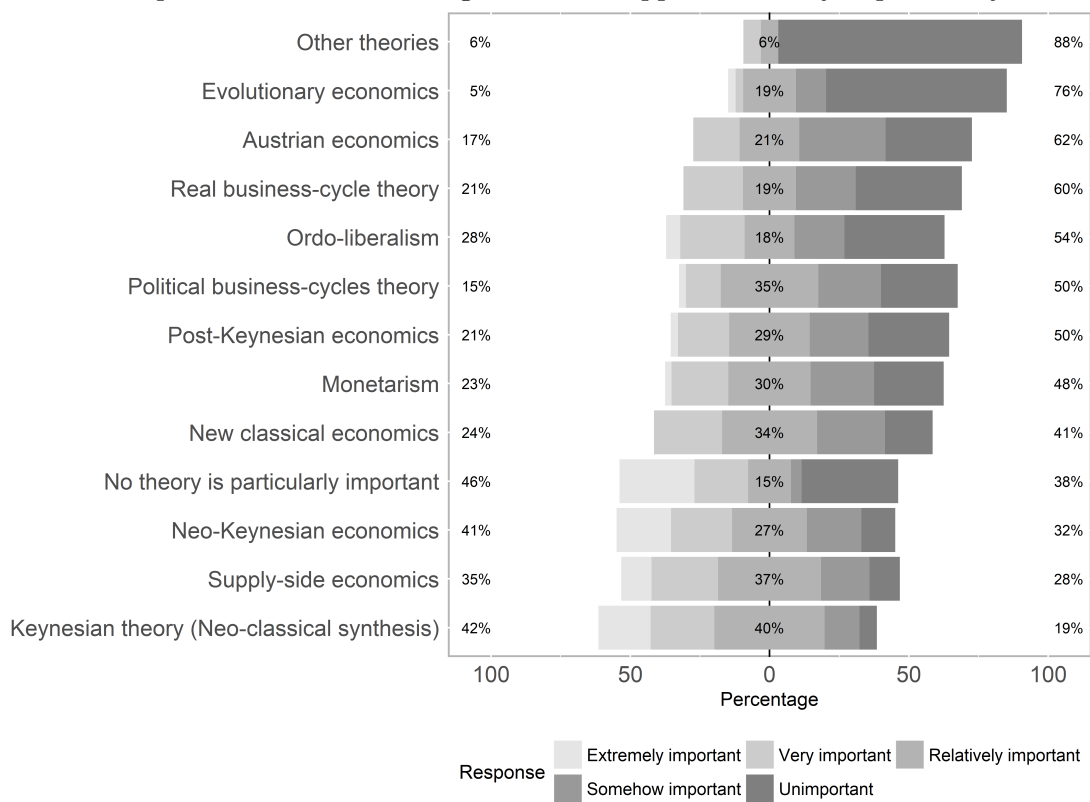
3.3 The main reasons for forecasting errors in the eyes of the forecasters

The reasons for forecasting errors have been subject to much academic efforts and public controversies (for an overview of some possible explanation see Fritsche and Tarassow, 2017; Stekler, 2007, and the literature cited therein). Thus, we have asked forecasters about the reasons for this. The results, depicted in figure 5 are striking: almost exclusively, forecasters see the most important sources of forecasting errors outside the forecasting process. Data revisions and wrong assumptions are frequently named as the things that have gone wrong. The first factor that can be associated with forecaster's wrongdoing ranks only at the fourth place among the listed reasons for errors, the possibility of missed structural breaks, Only a minority of the participants points to qualitative or quantitative problems with the underlying forecasting models. Some hypotheses, albeit quite popular in the academic literature – the idea of self-destroying forecasts and intentional forecast errors – find practically no support among the surveyed practitioners. Also, nearly no forecaster is prepared to admit that forecasting errors occur to do the financier or customer a favour. This hypothesis is by far the most popular explanation of forecasts errors in the media (Döpke, 2000, collects some quotes in this direction) and has some support in the political economy of policy advice (see, e.g. Ngo et al., forthcoming).

The answers given in the open answer category – see appendix section C – however, give some

Figure 4: Personal importance of theoretical approaches

How important are the following theoretical approaches for you personally?



Source: own survey and calculation

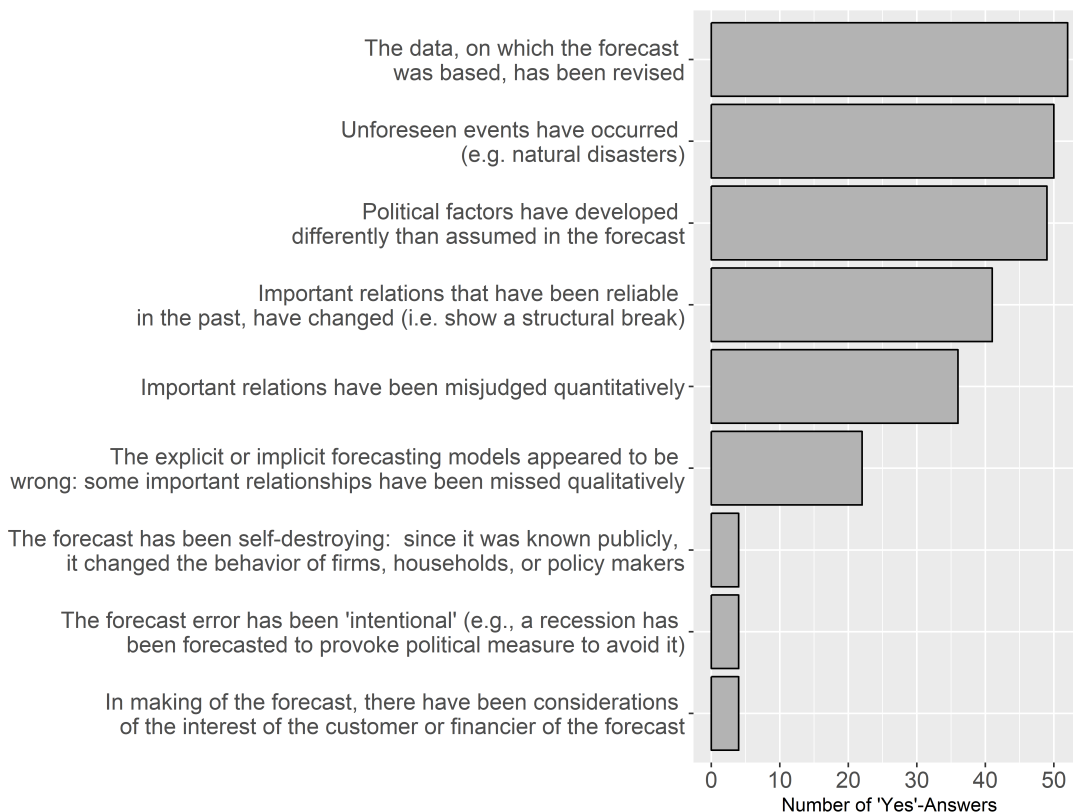
Table 5: Personal importance of theoretical position by age and institution

Null hypothesis: Does not depend on age				
Theoretical position	Older	Younger	t-test	Mann Whitney-test
Keynesian theory (Neo-classical synthesis)	3.2	3.0	-0.42 [0.68]	162.5 [0.87]
Post-Keynesian economics	2.2	2.5	-0.64 [0.53]	126 [0.62]
Monetarism	3.0	2.0	-2.95 [0.01]	66.5 [0.01]
Supply-side economics	3.2	2.7	-1.5 [0.14]	110.5 [0.12]
Neo-Keynesian economics	2.9	3.2	0.61 [0.54]	129.5 [0.54]
New classical economics	2.6	2.5	-0.08 [0.94]	118.5 [0.97]
Real business-cycle theory	1.9	2.2	0.78 [0.44]	138 [0.65]
Austrian economics	2.6	1.8	-2.17 [0.04]	75.5 [0.03]
Political business-cycle theory	2.7	2.0	-1.78 [0.08]	70 [0.09]
Evolutionary economics	1.4	1.2	0.68 [0.50]	107 [0.92]
Ordo-liberalism	2.4	1.9	- 1.04 [0.31]	78.5 [0.19]
Null Hypothesis: Does not depend on nature of institution				
Theoretical position	Private	Public	t-test	Mann Whitney-test
Keynesian theory (Neo-classical synthesis)	3.5	3.2	0.91 [0.37]	326 [0.36]
Post-Keynesian economics	2.8	2.0	2.35 [0.02]	253 [0.03]
Monetarism	2.8	2.2	1.49 [0.14]	298.5 [0.16]
Supply-side economics	3.1	3.0	0.32 [0.71]	286.5 [0.62]
Neo-Keynesian economics	3.2	3.2	0.06 [0.95]	213.5 [0.92]
New classical economics	2.9	2.4	1.59 [0.12]	273.5 [0.09]
Real business-cycle theory	2.2	2.2	0.06 [0.95]	220.5 [1.00]
Austrian economics	2.4	2.1	0.79 [0.43]	251 [0.42]
Political business-cycle theory	2.6	2.2	1.04 [0.30]	232 [0.37]
Evolutionary economic	1.4	1.3	1.21 [0.24]	217 [0.10]
Ordo-liberalism	2.6	2.3	0.68 [0.49]	212 [0.51]

Notes: The Likert-scale is recoded from 5 ("Extremely important") to 1 ("Unimportant").
p-values in brackets. Source: own survey and calculation.

Figure 5: Sources of forecast errors

Which of the following do you view as sources of forecast errors?
Please choose one or more items and write possible additional reasons.



Source: own survey and calculation

hints about the narratives which forecasters use to explain their forecast errors: “future is (simply) unknown” is stated at least twice and “high complexity” is also given as answer. Others point to (external) economic shocks that occurred but were excluded by assumption from the forecast or argue that wrong assumptions were made about variables not in the forecasting set (e.g. world trade volumes, oil prices, exchange rates). One forecaster mentioned “technical” mistakes in the way corrections were made due to seasonal or working day effects⁸.

3.4 Quantitative assessments

To obtain insights about the underlying beliefs of forecasters, we have also asked for some rough quantitative assessments, that may help to gauge the model the forecaster beliefs in. All assessments refer to a hypothetical macroeconomic situation. The first scenario is devoted to learn about the forecasters view of fiscal policy. This question has (re-)gained a lot of interest, since Blanchard and Leigh (2013) have argued in a seminal paper that botched macroeconomic predictions from the IMF may be attributed to an underestimation of the magnitude of the fiscal multiplier. For the “fiscal thought experiment”, the questionnaire lists several assumptions as documented in appendix section B.⁹

Figure 6a shows the magnitude of the multiplier estimated by the respondents in the short-run and in the long-run. The distribution of the estimates points to the possibility that German forecasters are at least in the short-run Keynesians: all multiplier exceed one and the distribution

⁸All statements in the respective open answer category are documented in appendix section C

⁹Basically a negative output gap, somewhat “normal” interest rates, no “zero lower bound” situation and a “normal” Taylor rule for monetary policy reaction.

Table 6: Quantitative assessments by nature of institution and theoretical position

	By institution			
	Private in-stitutions	Public institu-tions	Test for equal mean	Wilcoxon rank sum test
Short-run multiplier	1.07	1.12	-0.40 [0.69]	214.5 [0.85]
Long-run multiplier	0.74	0.53	0.99 [0.32]	211.5 [0.36]
Short-run impact of money supply	0.10	0.16	1.04 [0.30]	109.5 [0.22]
Long-run impact of money supply	0.71	0.64	0.50 [0.63]	143 [0.54]
Short-run impact of minimum wage	-0.10	-0.82	1.72 [0.10]	198.5 [0.04]
Long-run impact of minimum wage	-0.21	-1.37	1.33 [0.20]	196.5 [0.04]
	By theoretical position			
	Leaning Neoclassi-cal	Leaning Keyne-sian	Test for equal mean	Wilcoxon rank sum test
Short-run multiplier	1.25	1.08	-0.42 [0.71]	32 [0.87]
Long-run multiplier	0.67	0.65	-0.04 [0.97]	28 [0.89]
Short-run impact of money supply	0.35	0.11	-1.53 [0.34]	5.5 [0.08]
Long-run impact of money supply	1.00	0.69	-3.22 [0.01]	9 [0.27]
Short-run impact of minimum wage	-1.00	-0.54	NA	16 [0.29]
Long-run impact of minimum wage	0.00	-0.88	NA	6.5 [0.64]

Notes: p-values in brackets. Source: own survey and calculation. NA: calculation impossible due to lack of data.

centers around 1. In the long-run, however, the vast majority of the forecasters that have responded do not assume that fiscal policy can do any good and assumes a multiplier of by about zero. It is not clear, though, whether these estimates are actually used, when it comes to forecasting. After all, this is arguably the aim result of Blanchard and Leigh (2013) from the perspective of economic policy: the forecasters have misjudged the magnitude of to multiplier and therefore underestimated the impact of fiscal policy. A comparison of the explicit estimates with the estimates that are implicit in the forecasts would therefore be very interesting, but is beyond the scope and data of this paper. It is noteworthy, though, that the survey asked the forecasters to leave the form blank, if they are not able to give an assessment, which 41 persons actually did (as compared to 40, which gave an estimate). Furthermore, one person took the opportunity of the general comment at the end of the survey to argue that the information given on the scenario is not sufficient to quantify the impact of fiscal policy on growth.

The second “thought experiment”, for which respondents are asked to give quantitative guess is an acceleration of money growth in the Euro area (the ECB increases money supply permanently 1 percentage point faster than previously done) starting from an vaguely defined “equilibrium” situation in the absence of negative supply shocks.¹⁰ Figure 6b shows the distribution of the estimates in the short- as well as in the long-run. While virtually no forecasters gives money supply a big role for inflation in the short-run, there is considerable disagreement regarding the long-run effects: some forecasters see a zero or a minor impact of money growth on inflation. Roughly half of the respondents, however, assumes even a one-to-one relation between the two numbers (which might even correspond better to the old-school pre-Friedman quantity theory of money, as to the version with a non-stable, but predictable money demand).

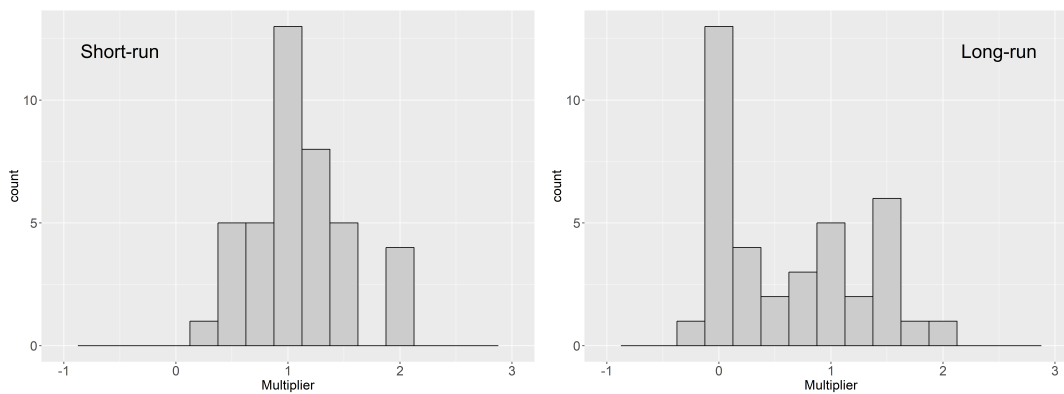
As a third “thought experiment” – see figure 6c – we asked forecasters about the employment effects of a 10 % increase of the minimum wage.¹¹ Interestingly, the bulk of answers point to “no” effects in the short as well as in the long run. However, disagreement is high: Some even assume a long-run elasticity of 0.75.

¹⁰ Again the assumptions are given in appendix section B.

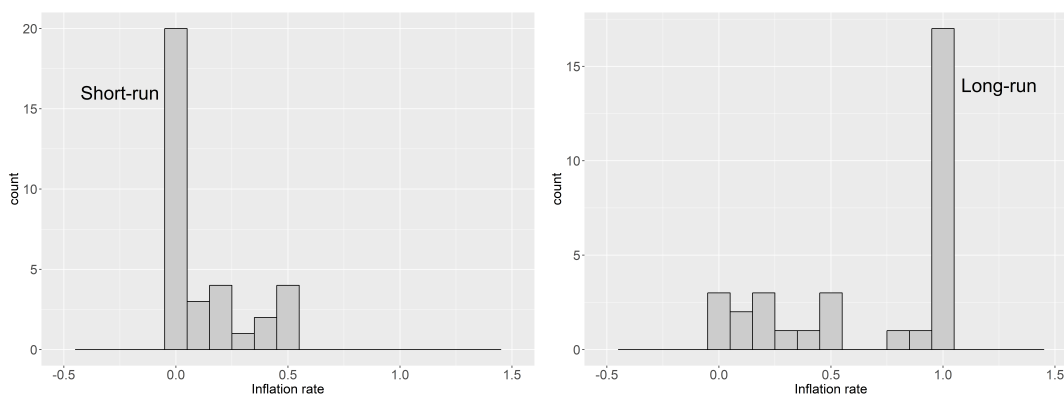
¹¹ Again the assumptions are given in appendix section B.

Figure 6: Distribution of quantitative assessments

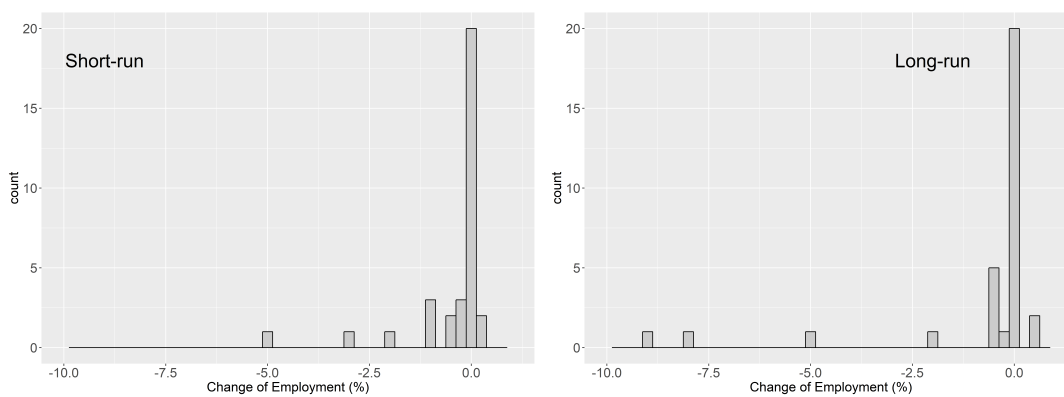
(a) Fiscal multipliers



(b) Money and inflation



(c) Impact of minimum wage on employment



Source: own survey and calculation

To check whether the quantitative assessments are in line with the reported underlying theoretical position of the forecasters, we grouped the forecasters into two subgroups: those, who lean towards more neoclassical positions and those, who have described themselves rather as a Keynesian and compare the quantitative assessments between these two groups (see Table 6). We confirm significant differences regarding the effects of money-supply shifts between the “neo-classical” and the “Keynesian” camps. We can furthermore see significant differences in the assessment of minimum wage increases between forecasters working in private and those working in public institutions. It is interesting to see, that on average forecasters working in public institutions are more concerned about negative consequences of minimum wage increases than those working in private institutions. To what extent ideological positions of the respective institutions play a role is a question for further research. There are no significant differences between the camps regarding the “fiscal multiplier thought experiment”.

3.5 Consequences of the *Great Recession*

Figure 7 shows the responses to a question exploring changes in the forecasting process that might have happened following the recent financial crisis and the subsequent *Great Recession*. The most popular answer is that the institutions now use “new” methods in forecasting. However, we offered a write-in possibility in this question to add “additional” methods that have been used for forecasting in the institution. Hence, the “new” method mentioned should shine up in the write-ins for that question, but this was generally not the case.¹²

However, we can infer some other tendencies from the open question part: Some forecasters seem to combine forecasts from different methods more often and re-evaluated their existing toolbox after the *Great Recession*. Furthermore, the sources of forecast errors are evaluated more often in some cases and measuring macroeconomic uncertainty seems to be more important for the forecast.

3.6 Consensus, the loss function, and the risk of herding

In this part of the survey, we tried to collect direct evidence on some topics that have recently been discussed in the academic literature about macroeconomic forecasting. To start with, we have taken a look on the self-perceived orientation of the forecasters towards the consensus forecast. The theoretical literature (Lamont, 2002) suggests that forecasters may face a trade-off: on one hand, sticking to the consensus reduces the risk of a (relative) reputation loss in case of a wrong prediction. On the other hand, departing from the consensus leads to additional attention from the public, which might be valuable for forecasters. The results depicted in figure 8, suggests that most of the forecasters seem to be risk-averse in this respect, i.e., being close to the consensus is much more popular than departing from the other forecasters. This is in line with the findings in the literature (see Doornik et al., 2012, 2014, and the literature cited therein).

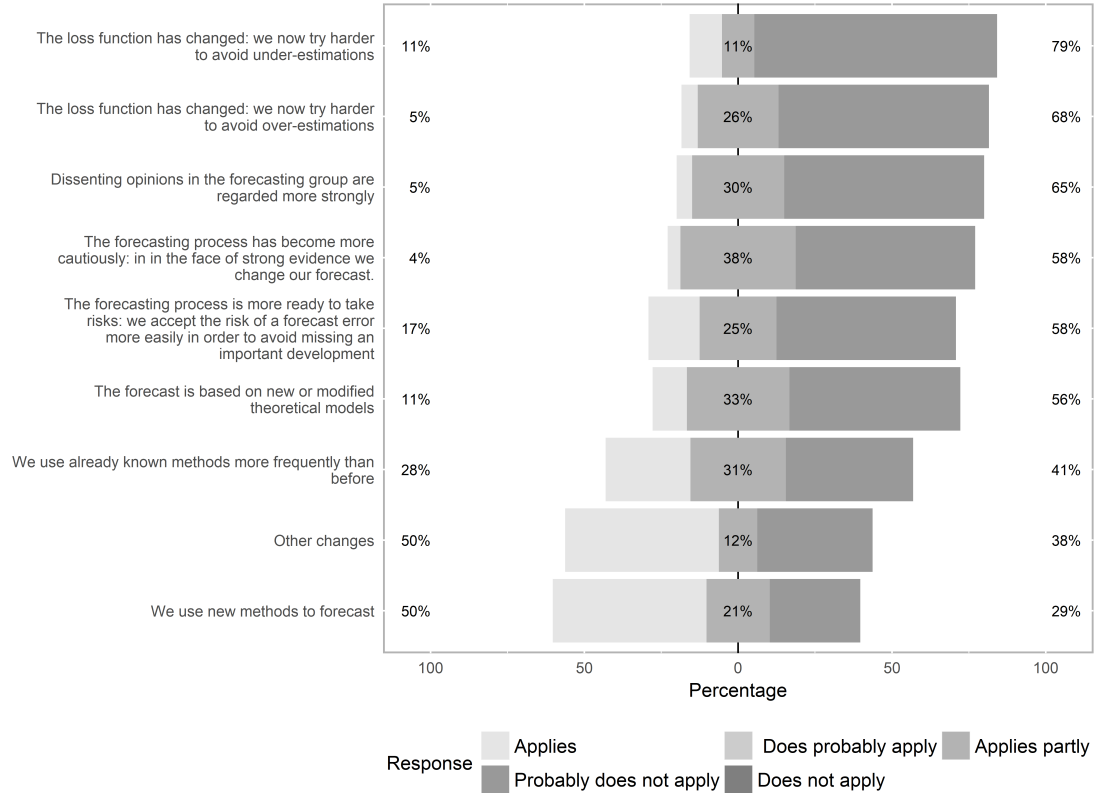
Another interesting part of the behaviour of the forecasters is, how quick they react to new information. Again, this might relate to the risk appetite of the individuals forecasters. Since new information might turn out to be wrong, risk averse forecasters might prefer to stick to the old forecast as long as not really strong case for a change can be made. Turning to our results, such an attitude is quite popular among the respondents, whereas the idea to react quickly is less frequently chosen. This again is in line with findings in the literature (see Nordhaus, 1987; Coibion and Gorodnichenko, 2012, 2015, and the literature cited therein).

We have also tested, whether the attitude towards the forecasting process depends on the nature of the forecasting institution (private vs. public). As the results in Table 7 show, the answers regarding the loss function and the speed of forecast revision seem to be quite similar, whereas the consensus forecast has different meanings for public and private forecasters: it is more important for public forecasters to stay on the neighbourhood of the consensus forecast. Assuming

¹²The statements that have been written into the free follow-up question are documented in appendix section C.

Figure 7: Consequences of the *Great Recession*

In the aftermath of the Financial Crisis 2008/09 economic forecasts have been criticized (again). This leads to the possibility that your institution may have changed its forecasting process. Which statements apply to your institution?



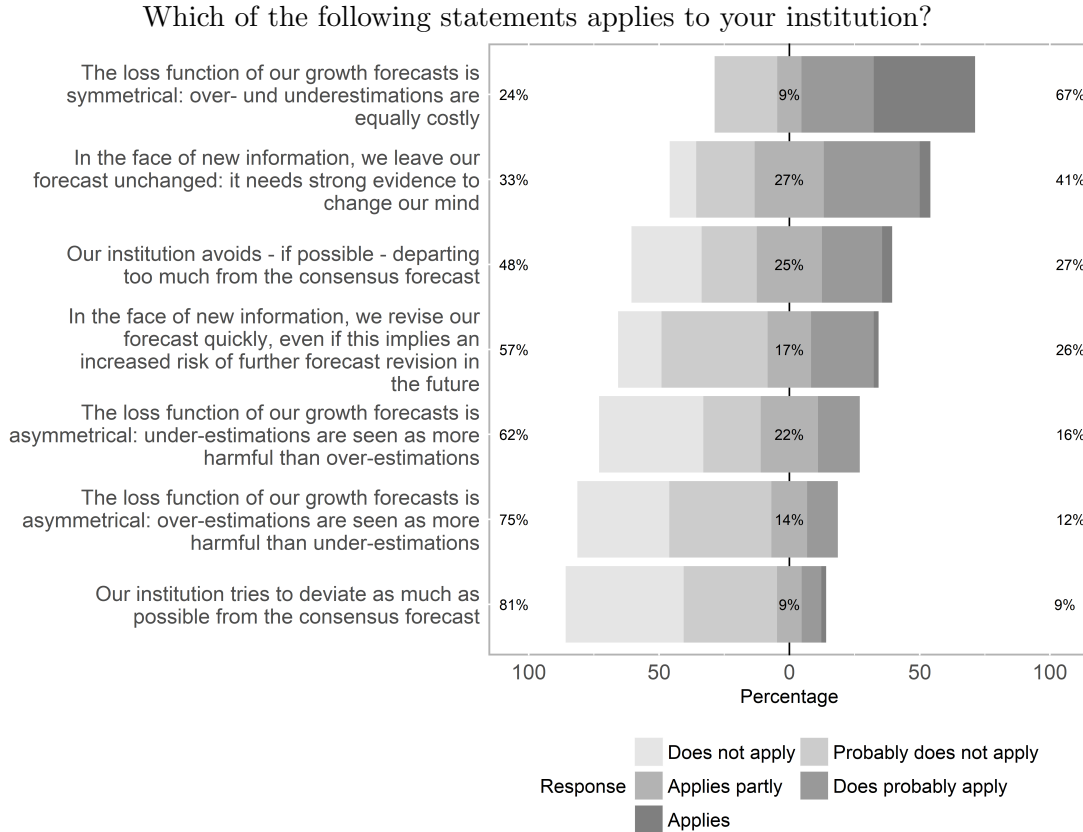
Source: own survey and calculation

Table 7: Attitudes to forecasting by nature of institution

Statement	Private institution	Public institution	t-test*	Wilcoxon rank sum test*
Null Hypothesis: Does not differ by nature of institution				
Symmetrical loss function	3.6	4.0	0.26	0.21
Staying close to the consensus	2.1	3.0	0.01	0.01
Revising forecasts fast	2.5	2.6	0.54	0.52

Notes: The Likert scale is recoded in such a way that a higher value corresponds to a stronger agreement to the statement. *) p-values. Source: own survey and calculation.

Figure 8: Attitudes to consensus and loss functions



Source: own survey and calculation

that private forecasters might have more incentives to search attention of the media etc., this finding would be in line with the reasoning of Ehrbeck and Waldmann (1996).

Another important topic refers to the loss function of forecasters. Several papers (see Döpke et al., 2010, and the literature cited therein) have tested, whether the loss function of the forecasters may be asymmetric. Thus, we have asked the forecasters directly, whether they value over- and underestimation differently. The vast majority of the forecasters is committed to a symmetric loss function, only a very few of them see the loss function of their institution as asymmetric. Among these answers, seeing over-estimation as more harmful is slightly more popular than the reverse case.

3.7 The organization of the forecasting group and motivation of the forecasters

It is quite possible, that forecast accuracy is not just limited by factors surrounding the institution, but also by the organization of the unit and motivation of its members. Hence, in a first step, we elaborated on the discussion process within the forecasting unit (see figure 9). Interestingly, a very large majority of the forecasters sees the final forecast as a consensus within the group. Decisions by the majority of the group or hierarchical decision processes are mentioned less frequently.

To some extent, the answers seem to contradict each other (e.g., both, the statement according to which the forecast is a consensus among the group, and the statement, according to which the leader of the group makes the final decision find substantial support).

The results in figure 10 suggest that forecasters are to a surprisingly degree intrinsically motivated. While statements like “I enjoy forecasting” find widespread support, suggested answers that would imply a extrinsic motivation are chosen only rarely. Part of a reason for this could be that usually, forecasting in practise is not a stand-alone profession, but often part of the tasks that

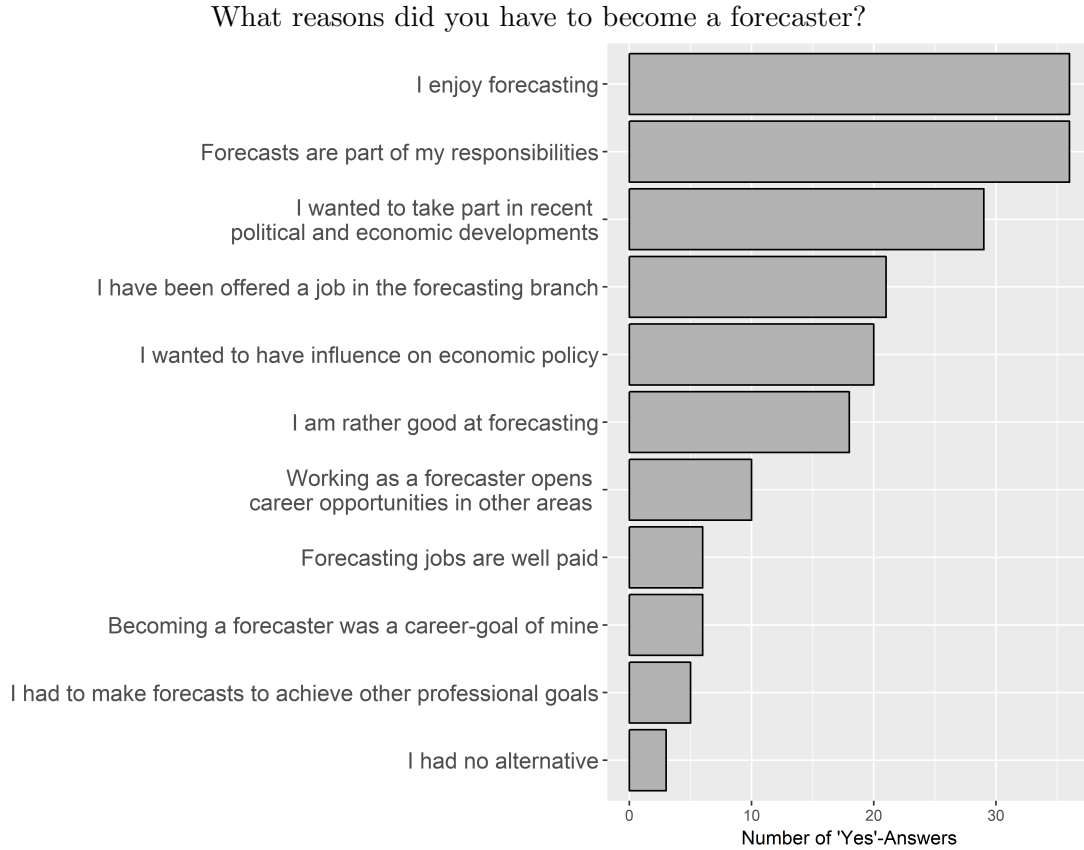
Figure 9: Decision making within the forecasting group

Which of the following statements applies to your institution?

	Mean (SD)	Applies to our institution	Probably does not apply to our institution	Does not apply to our institution	The statement makes no sense for my institution
Within the discussion of the forecast I try to convince the others of my opinion	1.50 (1.13)	83.3%	0.0%	0.0%	16.7%
The implications of the forecast have to be in line with the economic policy recommendations of our institution, even if this leads to a fading of the forecasting group's opinion into the background	2.57 (1.53)	47.8%	0.0%	0.0%	52.2%
The forecast serves as an input for other parts of our institution	1.23 (0.74)	90.9%	0.0%	4.5%	4.5%
The forecast is determined by the majority of the forecasting group	1.31 (0.81)	86.2%	0.0%	10.3%	3.4%
The forecast has to be coordinated with other parts of our institution that are not directly involved in the forecasting process	1.60 (1.24)	80.0%	0.0%	0.0%	20.0%
The final forecast is determined by the leader of the forecasting group	1.44 (1.04)	84.0%	0.0%	4.0%	12.0%
The final forecast emerges as a consensus within the forecasting group	1.00 (0.00)	100.0%	0.0%	0.0%	0.0%
In forming the forecast, rhetorical and argumentative skills of the group members are relevant	1.24 (0.77)	90.2%	0.0%	4.9%	4.9%
In discussing our forecast, we also use structured methods of opinion formation (e.g. the Delphi method)	3.43 (0.85)	7.1%	0.0%	35.7%	57.1%
In case of opinions diverging from the majority or the leader of the forecasting unit, it is possible to include the diverging positions into the text describing the forecast (e.g. as a risk scenario)	1.48 (1.06)	82.5%	0.0%	5.0%	12.5%

Source: own survey and calculation

Figure 10: Reasons to become a forecaster



Source: own survey and calculation

an employee in an economic research institute holds. Often times, forecasters have many responsibilities, of which forecasting is only one. Additionally, there is arguably one interesting exception from this general picture about a forecaster’s motivation: forecasters often state that they want to be part of recent economic and political developments and/ or like to have influence on economic policy. This might simply refer to the human wish to have a meaningful life. However, it could also indicate that some forecasters have an own political agenda and/ or hope for jobs in governments or central banks. These motivations might be seen as more extrinsic as compared to the sheer fun that forecasting might give to the forecasters.

Of course, working as a forecaster also has its disadvantages. We asked for some specific factors that might have demotivated the individuals that work in this area and report the results in Figure 11. The two most frequently chosen answers, however, might not be seen a specific to working in a forecasting unit: working with the colleagues and the bosses is most likely problematic in virtually all jobs from time to time. Factors that are more specific to the forecasting business are chosen less frequently.

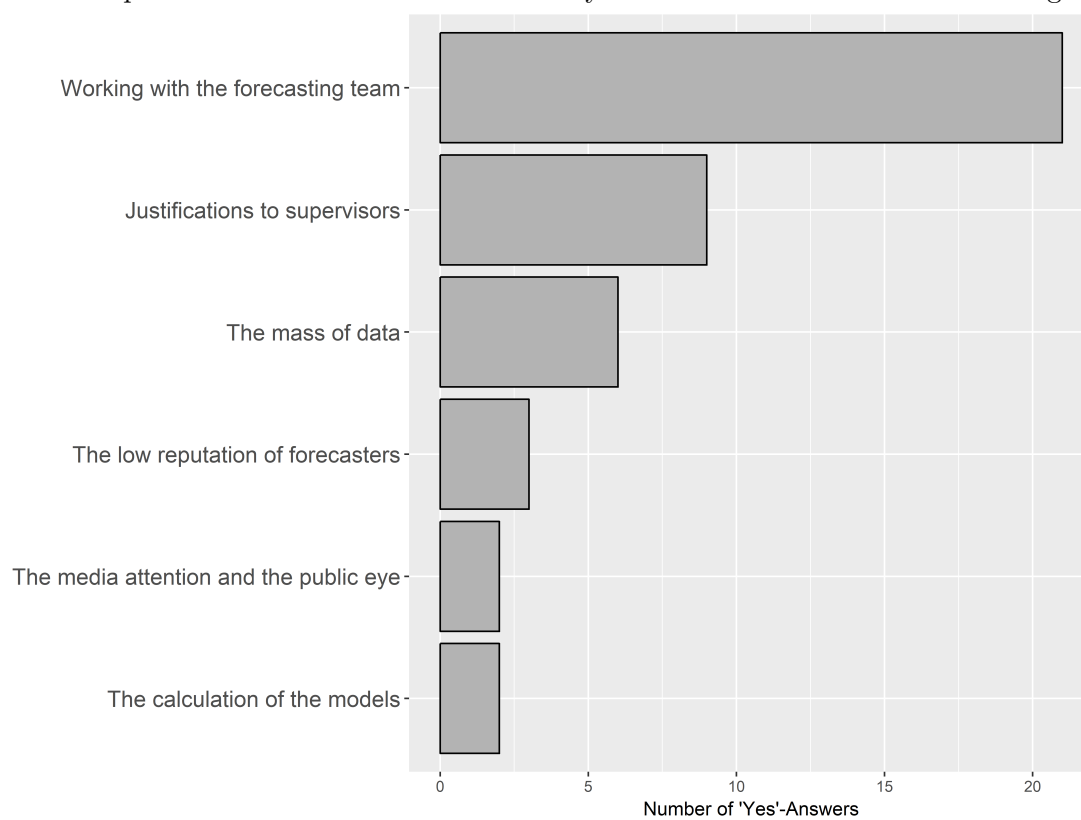
Nevertheless, some free answers to this question, listed in appendix section C, point to a problematic role of the forecasters in the public. For example, one forecaster claims that forecasts are, in fact, “irrelevant”. Another person complaints that there is little understanding for the forecasting work, even by others economists. It goes almost without saying that several forecasts name forecast errors and the related pressure and reputation loss as de-motivating.

3.8 Forecast quality by forecaster’s attributes

Hypotheses, which are arguably popular in the public opinion, state that forecast accuracy depends on certain attributes of forecasters. Forecasters in public and private institutions might face

Figure 11: What de-motivates Forecasters

Which aspects of the work as a forecaster do you find burdensome or demotivating?



Source: own survey and calculation

different incentives and, therefore, might be more or less successful in predicting future economic developments. Forecasters that rely on a specific theoretical model might also be systematically better or worse than those, who believe in another model.

Relying on the information of our survey, we are able to link a sub-sample of the forecasters to the forecast accuracy of their institution. To this end, we use the “long-term” evaluation conducted by Fricke (2016), who ranks several institution by forecast accuracy. Figure 12 depicts the (long-run) rank of a forecasting institution by theoretical position (Panel (a)) and by nature of institution ((Panel (b))). A higher rank corresponds to better forecast accuracy. While it seems not reasonable to undertake any statistical inference (we have only 4 institutions that qualify as leaning Neoclassical) eye-balling the data suggest no important differences between the two theoretical camps, although the Keynesian-leaning forecasters perform slightly better if one refers to the mean rank. By and large, the same holds for a break-down by the nature of the institution: no noteworthy differences are detectable. There is, however, a much smaller variance across the public institutions in the ranks.¹³ Still, we conclude that our results are in line with previous findings of, e.g., Batchelor and Dua (1990a), who conclude that “all forecasters are (statistically) equal.”

4 Conclusions

We have conducted a survey among active forecasters of the German business cycle. 82 forecasters stemming from 37 different institutions have responded. The results suggest that practitioners in the forecasting branch subscribe to well-established methods and theories. We find no close link to the recent debates in the more academic sphere. This might relate to the distinction between economists as “scientists” and “engineers” as argued by Mankiw (2006) and Colander (2017). Recent approaches from the academic literature (like, e.g., DSGE models) are more popular among forecaster from public institutions than among their colleagues from private institutions. In this context, the differences between “scientists” and “engineers” is not necessarily a problem: as both popular commentators of economic policy (Smith, 2017) and eminent academics (Blanchard, 2017) have pointed out, there are divergent aims of macroeconomics require different types of models.

Regarding two aspects, we can confirm findings from the earlier literature: First, forecasters seem to be risk-averse and tend to lean towards the consensus and second, there is a self-reported behaviour to revise forecasts only gradually. Both is in line with the finding in the literature.

According to our results, there is almost no evidence that the behaviour of forecasters has changed substantially since the *Great Recession*. Individual statements given in the open answer categories indicate however, that “experience” and “historical experience” were given as important elements of the forecasting process. It implies that the topic “how experience shapes expectations” is somewhat present but the effect might be different to quantify.

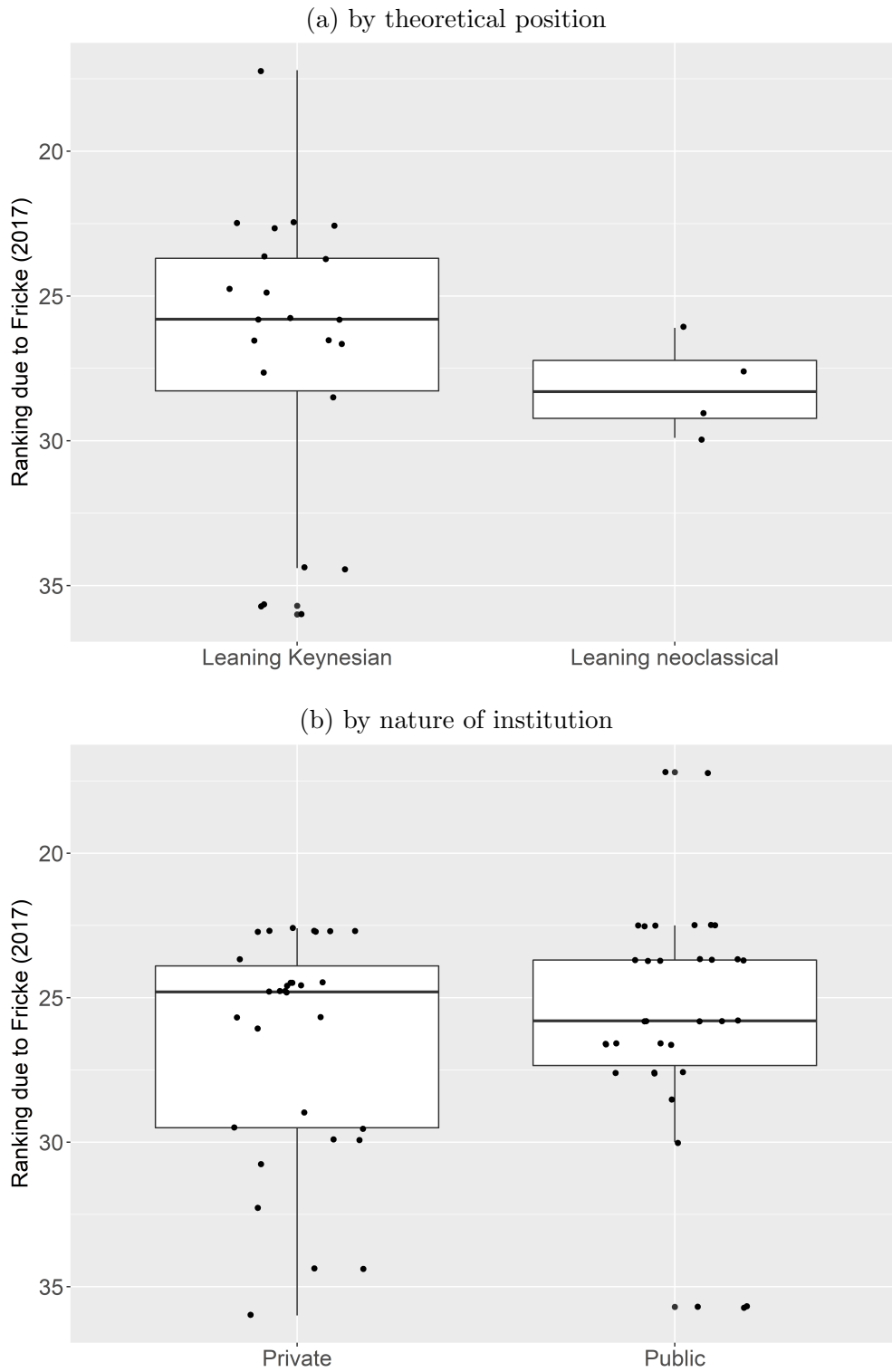
Confirming results from previous studies (Batchelor and Dua, 1990b) we also cannot establish a stable relationship between preferred theories and methods and forecast accuracy. The differences with respect to the theories forecasters subscribe to, however, point to cohort effects similar to effects observed among the general public (Malmendier and Nagel, 2016).

Furthermore, from the open answer categories we can also infer, that large forecast errors seem to have in impact on the self-perception and self-reflection of forecasters. Several forecasters report the high importance of uncertainty (in the Knightian sense) and report efforts to evaluate forecasts more regularly and try to minimize the dependency from one method.

Further research should in a complementary manner employ qualitative methods from different social science disciplines (sociology, psychology, political sciences, history) to shed more light on the mechanisms of expectation formation and the role of personal (historical) experience therein.

¹³At this point it is necessary to recall an important caveat of our analysis: we held the individual forecaster accountable for the accuracy of his/ her institution. It might well be the case that the forecasters would have known better, but was in a minority position within his/ her institution.

Figure 12: Forecast quality by theoretical position and nature of institution



Source: Fricke (2016) and own survey and calculation

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A List of institutions invited

- Economic research institutes, that are formally politically and economically independent:
 1. German Institute for Economic Research (DIW)
 2. RWI - Leibniz-Institute for Economic Research
 3. Halle Institute of Economic Research (IWH)
 4. Kiel Institute for the World Economy
 5. Ifo Institute – Leibniz Institute for Economic Research at the University of Munich
 6. Institute for Employment Research (IAB)
- (Mostly) privately financed forecasting institutions:
 7. Kiel Economics
 8. FERI
 9. Handelsblatt Research Institute
 10. IHS Global
 11. Hamburg Institute of International Economics (HWWI)¹⁴
 12. Prognos
- Institutes that are financed by interest groups:
 13. Macroeconomic Policy Institute (IMK)
 14. Cologne Institute for Economic Research (IW)
- International organizations
 15. International Monetary Fund (IMF)
 16. European Commission (EC)
 17. OECD
- Political institutions or institutions within the process of economic policy advice
 18. German Council of Economic Experts (Staff)
 19. Federal Ministry for Economic Affairs and Energy
 20. German Bundesbank
- Private Firms
 21. Commerzbank
 22. Deutsche Bank Research
 23. Postbank Research
 24. Allianz Economic Research
 25. MM Warburg Research
 26. Helaba Research
 27. Berenberg Bank
 28. DZ Bank
 29. Societe Generale Research
 30. Union Investment
 31. Goldman Sachs
 32. ING Bank Germany
 33. Landesbank Berlin
 34. Sal. Oppenheim
 35. Deka Bank
 36. IKB
 37. NORD LB
 38. Bayern LB
 39. HSBC Trinkaus

¹⁴Up to 2005, this institute was named HWWA and mainly publicly funded. From 2006 onwards, the institute has been run as a privately funded institute.

40. LB Baden-Württemberg
41. UniCredit
42. Morgan Stanley
43. PIMCO
44. Bremer Landesbank
45. Degussa
46. E.on
47. Collineo
48. SEB
49. Berliner Sparkasse
50. Bank J. Safra Sarasin

- Associations:

51. Bundesverband Deutscher Banken
52. Chambers of Commerce and Industry (DIHK)
53. Bundesverband der Deutschen Industrie (BDI)
54. Mechanical Engineering Industry Association (VDMA)
55. Bundesverband der deutschen Volks- und Raiffeisenbanken

B The questionnaire

Question 1:

Which of the following elements do you take into account in your forecasts?

Check any that apply

- Global political developments
- National political developments
- Local political developments
- Comments in the media
- Public debates
- Mathematical / formal models
- Insights from behavioral economics
- Insights from historical analysis
- Insights from psychology / sociology
- Survey data (e.g. the Ifo business climate index)
- Personal viewpoints
- Other:

Question 2:

How often does your institution use the following methods in the forecasting process?

	Always or very often	Often	Sometimes	Rarely	Never
Intuitive methods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Iterative national-accounts-based method	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leading indicators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Structural single equation models (e.g. a consumption equation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Non-linear single equation models (e.g. Probit models to forecast recessions)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Single equation time series models (e.g. ARIMA models)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Structural multi-equation models (e.g. the NIGEM- or RWI model)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Multivariate time series models (e.g. VARs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DSGE (Dynamic Stochastic General Equilibrium) models	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Machine learning tools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forecast combination (e.g. model averaging)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other methods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 2. cont.:

You have chosen "Other methods" in the previous question.

Please indicate briefly the method(-s) you have in mind and how often they are used.

Question 3:

How important are the following theoretical approaches for the forecasting process in your institution?

	Extremely important	Very important	Relatively important	Somehow important	Unimportant	No assessment possible
Keynesian Theory ("Neo-classical Synthesis")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Post-Keynesian Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Monetarism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supply-side Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Neo-Keynesian Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New Classical Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Real Business-Cycle Theory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Austrian Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Political Business-Cycles Theory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evolutionary economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ordo-Liberalism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other theories	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No theory is particularly important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 4:

How important are the following theoretical approaches for you personally?

	Extremely important	Very important	Relatively important	Somehow important	Unimportant	No assessment possible
Keynesian Theory ("Neo-classical Synthesis")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Post-Keynesian Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Monetarism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supply-side Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Neo-Keynesian Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New Classical Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Real Business-Cycle Theory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Austrian Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Political Business-Cycle Theory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evolutionary economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ordo-Liberalism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other theories	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No theory is particularly important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 3, cont.

You have chosen "other theories" in the previous question.

Please indicate briefly, which theories you have in mind and how important they are.

Question 5:

In the following, we would like you to make some quantitative assessments.

The first one refers to the magnitude of a possible multiplier effect of additional government spending.

As a starting point, please consider the following hypothetical situation:

- The German economy exhibits a noticeable negative Output gap.
- Short-run nominal interest rates are roughly at their long-run average before the Financial crisis (i.e. the economy is not at the "zero > lower bound")
- It is assumed that monetary policy follows an unchanged reaction function.

If you can't make an assessment, please leave the answering-field blank.

Only numbers may be entered in these fields.

How large is the multiplier of additional government spending in the short-run?

How large is the multiplier of additional government spending in the long-run?

Question 5, cont.

Please consider now the following hypothetical situation for Germany

- The Output-gap is roughly zero.
- The inflation rate is slightly below 2 %
- There is still considerable unemployment.

If you can't make an assessment, please leave the answering-field blank.

Only numbers may be entered in these fields.

Assume, the statutory minimum wage would be increased by 10% at the beginning of the next year, by how much % total hours worked will change in the short-run?

Assume, the statutory minimum wage would be increased by 10% at the beginning of the next year, by how much total hours worked will change in the long-run (in %)?

Question 5, cont.:

Please consider now the following hypothetical situation for the Euro-zone:

- The Output-gap is roughly zero.
- The inflation rate is slightly below 2 %
- There is still considerable unemployment.
- There are no negative supply shocks (e.g. oil price shocks).

If you can't make an assessment, please leave the answering-field blank.

Only numbers may be entered in these fields.

If the ECB increases money supply permanently 1 percentage point faster than previously, by how much will the inflation rate in the Euro-zone increase in the short-run?

If the ECB increases money supply permanently 1 percentage point faster than previously, by how much will the inflation rate in the Euro-zone increase in the long-run?

Question 6:

Which of the following statements applies to your institution?

	Applies to our institution	Probably does not apply to our institution	Does not apply to our institution	The statement makes no sense for my institution
The final forecast emerges as a consensus within the forecasting group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The forecast is determined by the majority of the forecasting group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The final forecast is determined by the leader of the forecasting group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In case of opinions diverging from the majority or the leader of the forecasting unit, it is possible to include the diverging positions into the text describing the forecast (e.g. as a risk scenario)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In discussing our forecast, we also use structured methods of opinion formation (e.g. the Delphi method)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Within the discussion of the forecast I try to convince the others of my opinion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In forming the forecast, rhetorical and argumentative skills of the group members are relevant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The forecast has to be coordinated with other parts of our institution that are not directly involved in the forecasting process.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The forecast serves as an input for other parts of our institution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The implications of the forecast have to be in line with the economic policy recommendations of our institution, even if this leads to a fading of the forecasting group's opinion into the background	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 7:

Which of the following do you view as sources of forecast errors?

Please chose one or more items and write possible additional reasons.

Check any that apply

- The data, on which the forecast was based, has been revised
- Political factors have developed differently than assumed in the forecast.
- Unforeseen events have occurred (e.g. natural disasters).
- The explicit or implicit forecasting models appeared to be wrong: some important relationships have been missed qualitatively.
- Important relations have been misjudged quantitatively
- Important relations that have been reliable in the past, have changed (i.e. show a structural break)
- The forecast error has been "intentional" (e.g., a recession has been forecasted to provoke political measure to avoid it).
- The forecast has been self-destroying: since it was known publicly, it changed the behavior of firms, households, or policy makers.
- In making of the forecast, there have been considerations of the interest of the customer or financier of the forecast
- Please indicate briefly any other reasons for forecast errors, you find important

Question 8:

In the aftermath of the Financial Crisis 2008/09 economic forecasts have been criticized (again). This leads to the possibility that your institution may have changed its forecasting process.

Which statements apply to your institution?

	Applies	Does probably apply	Applies partly	Probably does not apply	Does not apply	Don't know / no assessment possible
We use new methods to forecast.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We use already known methods more frequently than before.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The forecast is based on new or modified theoretical models.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The forecasting process is more ready to take risks: we accept the risk of a forecast error more easily in order to avoid missing an important development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The forecasting process has become more cautiously: in the face of strong evidence we change our forecast.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The loss function has changed: we now try harder to avoid over-estimations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The loss function has changed: we now try harder to avoid under-estimations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dissenting opinions in the forecasting group are regarded more strongly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other changes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 8, cont.

You have chosen "other changes" in the previous question.

Please indicate briefly the changes you have in mind.

Question 9:

Which statements apply to your institution?

	Applies	Does probably apply	Applies partly	Probably does not apply	Does not apply	Don't know / no assessment possible
The loss function of our growth forecasts is symmetrical: over- und underestimations are equally costly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The loss function of our growth forecasts is asymmetrical: over-estimations are seen as more harmful than under-estimations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The loss function of our growth forecasts is asymmetrical: under-estimations are seen as more harmful than over-estimations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our institution avoids - if possible - departing too much from the consensus forecast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our institution tries to deviate as much as possible from the consensus forecast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the face of new information, we leave our forecast unchanged: it needs strong evidence to change our mind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the face of new information, we revise our forecast quickly, even if this implies an increased risk of further forecast revision in the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 10:

Are you in touch with forecasters from other institutions? If so, in which context?

	Frequently	Rarely	Never
I have contact to other forecasters in a professional context	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have contact to other forecasters in a private context, exceeding a pure professional contact	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Personal data

Gender

Female Male

Personal data

Please indicate your highest degree, or your position

Choose one of the following answers

Personal data

Please indicate your field of studies.

Choose one of the following answers

- Business Administration
- Economics
- Social Sciences
- Humanities
- Law
- Mathematics
- Computer sciences
- Natural Sciences
- No academic studies
- Other:

Personal data

Which description fits best to your position within your institution?

Check any that apply

- Employee
- Researcher
- Head of research group within the forecasting unit
- Head of research group outside the forecasting unit
- Head of the forecasting unit
- Head of a unit that is superior to the forecasting unit (e.g. part of the administration of the institute)
- Other:

Personal data

Which description best describes your institution?

Check any that apply

- Institute based on public funding
- Institute based on private funding
- Institute funded by trade unions or employers' associations
- Part of a private firm
- Part of an association
- Central bank
- Private Bank or insurance company
- Think Tank
- Staff of institution for policy advice
- Other:

Personal data

Only numbers may be entered in these fields.

Please indicate your year of birth

How long have you worked on forecasts (round figure in years)

How long have you worked in your current position (round figure in years)?

How many people work on the forecast in your institution (round figure in full-time equivalents)?

What reasons did you have to become a forecaster?

Check any that apply

- Becoming a forecaster was a career-goal of mine
- I enjoy forecasting
- I am rather good at forecasting
- Forecasts are part of my responsibilities
- I have been offered a job in the forecasting branch
- I had no alternative
- I wanted to take part in recent political and economic developments
- I wanted to have influence on economic policy
- I had to make forecasts to achieve other professional goals
- Forecasting jobs are well paid
- Working as a forecaster opens career opportunities in other areas
- Other:

Which aspects of the work as a forecaster do find burdensome or demotivating?

Check any that apply

- The mass of data
- Justifications to supervisors
- The media attention and the public eye
- The calculation of the models
- The low reputation of forecasters
- Working with the forecasting team
- Other:

You have now reached the end of our survey.

Below you are given the opportunity to comment on the survey or any other aspect you might consider relevant.

Thank you very much for your help.

C Write-in answers to questions

Elements of the forecasting process

The following statements have been made in response to the question: "Which of the following elements do you take into account in your forecasts?" under the category "other"? (each item corresponds to one respondent)

- "Ökonometrische Modelle" (Econometric models)
- "Konjunkturdaten vom aktuellen Rand (Aufträge, Produktion) sowie Entwicklung an den Finanzmärkte und Preisentwicklung für Rohstoffe" (Recent economic data (order inflow, production) as well as the development at financial markets and the prices of raw materials)
- "Erfahrung" (Experience)
- "Faustregeln" (Rules of thumb)
- "Kurzfristige Konjunkturindikatoren" (Short-run business cycle indicators)
- "Ökonomische Theorie" (Economic theory)
- "Politökonomische Erwägungen" (Considerations based on political economy)
- "Wissenschaftliche Erkenntnisse" (Scientific insights), "Institutionelle Kenntnisse" (Institutional knowledge)
- "Historische Erfahrungen" (Historical experiences)
- "Persönliche Einschätzungen" (Personal assessments)
- "Politische Bedürfnisse der höheren Ebenen" (Political necessities of higher levels)
- "Persönliche Prognoseerfahrung" (Personal forecasting experience)
- "Daten, institutionelle Fakten" (Data, institutional facts)
- "Marktentwicklung" (Market developments)
- "Diverse Indikatoren (Industrieproduktion, Einzelhandelsumsätze, Aufträge, Kreditvergabe, ...)" (Several indicators (industrial production, retails turnover indices, loans)
- "Prognoseirrtümer der Vergangenheit" (Past forecast errors)
- "Geldpolitik" (Monetary policy)
- "Finanzmarktpreise" (Prices on financial markets)
- "Erfahrungswissen" (Experience-based knowledge)
- "Analysen unterschiedlichster Institute/Ökonomen/Analysten" (Analyses of several institutes / economists / analysts)
- "Eigene Unternehmensbefragung" (Own survey among firms);
- "Amtliche Statistik" (Official statistics).

Other methods

The following additional or alternative models have been mentioned (each item corresponds to one respondent) in response to the question: "You have chosen "Other methods" in the previous question. Please indicate briefly the method(-s) you have in mind and how often they are used."

- "Zyklusvergleich" (Comparison of cycles) and "Nicht-parametrische Methoden" (Non-parametric methods)
- "Faustregeln" (Rules of thumb) and "Historische Elastizitäten" (Historical elasticities)
- "Judgemental adjustments, Horizontal brainstorming"
- "Eigene Umfragen" (Own surveys)
- "Zyklusvergleiche" (Comparison of cycles)
- "Eigene Unternehmensbefragung" (own business survey) (Note: we have skipped additional information to keep the anonymity.)
- "Kurzfristprognose-Modelle (Faktormodelle, Brückengleichungen). Häufig und regelmäßig (alle 2 Wochen)." (Short-term forecasting models, factor models, bridge-equations, often and on a regular basis (every 2 weeks)).

Other theories

The following statements have been made in response to the question: "You have chosen "other theories" in the previous question. Please indicate briefly, which theories you have in mind and how important they are."

- "Debitismus"¹⁵
- "Klassische Politische Ökonomie(,) Marxismus" (Classical political economy, Marxism)

Reasons for forecast errors

The following additional possible reasons of forecast errors have been mentioned (each item corresponds to one respondent):

- "Annahme unveränderter Politik" (Assumption of an unchanged policy)
- "Hohe Komplexität: Die falschen Wirkungszusammenhänge hervorgehoben" (High complexity, the wrong causal relations highlighted)
- "Die Zukunft ist unbekannt." (The future is unknown)
- "Unvorhergesehen Ereignisse, außer Naturkatastrophen." (Unforeseen events except natural disasters)
- "Prognosefehler bei exogenen Variablen, die als Input im Modell verwendet werden, z.B. Welthandel, Wechselkurs, Ölpreis" (Forecast errors for exogenous variables, that are used as inputs for the model (e.g. world trade, exchange rates, oil prices))
- "Die Frage ist allgemein formuliert, d.h. alle denkbaren Gründe sind irgendwann irgendwo einmal relevant gewesen" (The question is formulated too general, i.e. all possible reasons have been relevant at some place for a certain time.)
- "Die Zukunft ist unbekannt." (The future is unknown)
- "Ferientage und Saisoneffekte falsch" (Trading days and seasonal effects wrong)
- "Überbewertung von persönlichen Eindrücken und Stimmungen" (Too much weight for personal impressions and sentiments)
- "Shit happens".
- "ökonomische Schocks treten auf, die per Annahme ausgeschlossen wurden." (Economic shocks occur that have been ruled out by assumption)

Changes due to financial crisis

The following statements have been given in response to the question about what has changed in the forecasting process due to the Financial Crisis:

- "Überarbeitung bestehender und Schätzung neuer ökonomischer Modelle (neue Indikatoren, Model Averaging)" (Overhaul of existing and estimation of new econometric models (new indicators, model averaging))
- "Wir sind uns der Ungenauigkeit bewusster, denken in größeren Bandbreiten, legen mehr Wert auf Risikoszenarien" (We are more aware of inaccuracy, think in broader bandwidths, give greater emphasize on risk scenarios)
- "Systematische Prognosefehlerevaluation" (Systematic forecast error evaluation)
- "Literatur zur Prognose ist vielschichtiger geworden und erfordert eingehenderes Studium." (The literature regarding forecasts has become more complex and demands in-depth studies)
- "Vielfalt der Prognosemethoden und -modelle und Prognosekombination" (Diversity of forecasting methods, models, and combination)
- "Wir schauen starker auf Unsicherheitsmaße, die auf Marktpreisen basieren. Außerdem beachten wir mehr die Bilanzen der Unternehmen und privaten Haushalte, weil laufende Bilanzbereinigungen das Wachstum schwächen. Schließlich sind Blasen wichtiger geworden." (We are looking more strongly on measures of uncertainty, that rely on market prices. Moreover, consider more strongly the balance sheets of firms and private households, since balance sheet adjustments weaken economic growth. Finally, bubbles have become more important.)
- "Anpassung der eigenen Befragungsmethodik (kürzerer Befragungszeitraum, schnellere Veröffentlichung)" (Adjustment of the own survey technique (shorter survey period, faster publication).)

¹⁵This view traces back to Heinsohn and Steiger (2013).

Demotivation

The following statements have been given in response to the question, what possibly de-motivates forecasters (each item corresponds to one respondent):

- "Konjunkturprognosen sind faktisch irrelevant." (Business cycle forecasts are - in fact - irrelevant)
- "Dass wenig Zeit für anderes bleibt" (That there is not enough time for other things)
- "Die falsche Wahrnehmung über die Treffsicherheit von Konjunkturprognosen. In der Öffentlichkeit und bei Kollegen wird zu wenig anerkannt, wie unsicher (Schocks usw.) das Eintreten von Prognosen ist. Ferner wird dann auf fehlende Kompetenz geschlossen. Das trifft nicht nur auf die Öffentlichkeit, sondern auch auf andere Volkswirte anderer Bereiche zu." (The wrong perception of the forecasts. The public opinion and the colleagues do not sufficiently recognize how uncertain (shocks etc.) the realisation of forecasts is. Moreover, from this it is concluded that forecasters are not competent. This does not only hold for the general public, but also for economist from other areas).
- "Nichts" (Nothing).
- "Politische Einflussnahme" (Political influencing)
- "Das geringe Grundverständnis anderer Wissenschaftler und der Öffentlichkeit für die Prognosearbeit (z.B. inhärente Prognosefehler, Aufwand Porognosen zu erstellen, Relevanz für andere Bereiche wie wirtschaftspolitische Bereiche)" (The little understanding of other scientist and the public for forecasting work. (e.g., inherent forecast errors, the effort to produce forecasts, the relevance for other areas and areas of economic policy).
- "Nichts davon in relevantem Maße" (Nothing of the above to a relevant extend)
- "Die Datenqualitaet" (Data quality)
- "Die geringe Prognosegüte" (The lack of forecasts accuracy)
- "Ungünstiges Verhältnis von Aufwand (Daten-, Modellupdate, Text schreiben etc.) und Ertrag (Aufmerksamkeit i.S.v. "in der wirtschaftspolitischen Debatte Gehör finden" (Unfavourable relation of effort (data and model update, writing text, etc.) and rewards (attention in the economic policy debate)
- "Nichts" (Nothing)
- "Keine" (None)
- "Fehlprognosen" (Forecast errors)
- "Nichts" (Nothing)
- "Limited time budget"
- "Der generelle Stress im Beruf" (The general stress in the job)
- "Druck bei Fehlprognosen" (Pressure in case of forecast errors).

Other remarks

At the end of the questionnaire, we asked in a free question for general comments, which may have occurred during answering the survey

- "Die Fragen zu Fiskalmultiplikator, Mindestlohn etc empfinden ich als sehr problematisch, da das Situationsbedingte/der Kontext noch viel mehr abgefragt werden müsste" (I see the question regarding the fiscal multiplier, minimum wage etc. as very problematic, since the situational context should have been queried much more precisely)
- "Beim langfristigen Fiskalmultiplikator hätte ich gerne die Möglichkeit gehabt, einen negativen Wert einzugeben." (As regards the long-run multiplier I would like to had the opportunity to enter a negative value)
- "Mir wären oftmals eindeutige Antwortmöglichkeiten wie ja/nein lieber als diese graduellen Abstufungen." (I would have preferred clear-cut yes/no-answer opportunities instead of the graduations.)
- "Makroökonomische Konjunkturprognosen sind weit mehr als nur eine möglichst treffsichere Punktprognose für BIP-Wachstum oder Inflation. Jenseits der kurzen Frist (1-2 Quartale) ist die Prognosegüte nicht anhand des Prognosefehlers festzumachen (einfache Vergleichsmodelle wie AR-Prognosen sind dort nämlich kaum zu schlagen), sondern anhand der Konsistenz und Stimmigkeit des Prognosegesamtbildes und seiner verschiedenen Komponenten ("Story" hinter dem Prognose-Basissszenario - dieses stellt die aus Sicht des Prognostikers wahrscheinlichste Entwicklung bedingt auf die exogenen Annahmen und auf die Annahme des Abklingens vergangener ökonomischer Schocks und des Ausbleibens zukünftiger Schocks dar" (Macroeconomic business cycle forecasts are much more than just as precise as possible a point forecast of GDP growth or inflation. Beyond the very short-run time horizon(1-2 quarters) forecast accuracy cannot be measured with a simple forecast error (since simple competing models like AR models are much better in this regard). Rather, forecasts have to be judged by the consistency and coherence of the underlying picture and its different components (the "story" of the base-scenario of the forecast, which gives the most likely development in the eyes of the forecaster given the assumptions for exogenous factors and the unwinding of past economic shocks and the non-existence of future shocks))