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Epistemic participation: How to produce knowledge about the economic future

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Abstract

This article explores economic forecasting by examining the various social settings and networks economic forecasters are embedded in. It discusses how forecasters meet with political and economic actors and also how members of forecasting teams embody main aggregates of the economy to commonly produce a consensus about the economic future. The data underlying this article were collected from three economic forecasting institutes in German-speaking countries and consist of interviews with economic forecasters and representative users of the forecasts in economic and political organizations. article argues that on the backstage of economic forecasting, macroeconomic models are subordinate. Rather, the production process of economic forecasts is embedded in various formal and informal networks. The article summarizes the activities on the backstage of economic forecasting by using the notion of 'epistemic participation'. This means that the forecasters give their object of inquiry, which is the economy, the opportunity to participate actively in the epistemic process. Epistemic participation has two dimensions: First, it takes place in a network including the forecasters and key individuals from the economy and economic policy. Second, forecasters identify with significant parts of the economy and give them a body and a voice. Epistemic participation conceptualizes the relationship between researchers and a highly reflexive and communicative object.

Keywords

economic forecasting, economy, epistemic participation, expectations, future, macroeconomics, sociology of economics

Introduction

Economic forecasters are expected to produce credible knowledge about the economic future using empirical data from the past. For natural scientists, this procedure

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may be common practice. However, economic forecasters are investigating 'the economy', which is highly interactive and reflexive; history shows that there is no reason to assume a correlation between the past and the future. Furthermore, economic forecasting itself is being challenged by both philosophers of science and practitioners. Prediction, some argue, is neither possible in economics nor possible in social sciences as a whole. In the 1960s, Popper (1965) argued that forecasts are only possible in isolated, static, and cyclic systems, three characteristics that do not fit economies (or societies). More recently, Taleb (2007) claims that social science researchers cannot produce forecasts because current methodologies cannot predict so-called outliers, factors that do not fit 'normal' development though they influence our world much more than anything else. Others argue that forecasts – no matter what topic is predicted – have nothing to do with the future but are made for the present. They simply legitimate decisions and discipline people (cf. Bombach, 1962; Liessmann, 2007).[1]

However, although some are skeptical about economic forecasts, those who are willing to pay do use them as a basis for economic and political decision making (Evans, 1997). This raises the question of how, despite the doubts, economic forecasters manage to produce knowledge about the economic future that is deemed credible and valuable. To address one part of this question, I analyze epistemic strategies within economic forecasting. Drawing on theories and methodologies from social studies of science, this article analyzes how economic forecasters in German-speaking countries produce forecasts. In doing so, I investigate the relationship between the forecasters and their scientific object, 'the economy'. It could be said that this article offers a sociological view of the inside of the economic forecasters' world in German-speaking countries. I do not attempt to show the history of ideas of economic forecasting, nor do I explain econometric models (Morgan, 2013). Rather, my intention is to investigate how economic forecasters use their social setting to gather information relevant to the economic future and to analyze their relationships to representatives of the economy.

For the economic forecasters with whom I spoke, econometric models are nothing more than a starting point for a forecast. Although mathematical models are described as 'useful' and 'informative', the forecasters rely much more on an epistemic process they have developed over many years, a process I call 'epistemic participation'. In this process, it is possible to produce legitimate and credible scientific knowledge by giving parts of the object under investigation, in this case, the economy, the opportunity to participate constitutively in the epistemic process in question. Epistemic participation thus transforms the traditional relationships between the researcher and the object of research. It is a variation of the interleaving of social and epistemic spaces.

The argument developed in this article relates to some of the long-standing questions of epistemology: how can we characterize the relationship between the scientist and the studied object? And, how are social and epistemic orders interwoven? The analysis of the socially embedded production process of economic forecasts beyond econometric models and quantitative data throws light on a case where the object of research is highly reflexive and communicative. Introducing the concept of epistemic participation, this article describes how the boundaries between the researcher and the object of research blur and nearly vanish.

The article starts with a brief presentation of forecasts as a special case of expectations. This is followed by the introduction of two theoretical concepts that help in understanding how actors produce expectations and assumptions about the future. I then describe the field of economic forecasting in the German-speaking region and the methods I used to gather qualitative data. In the three ensuing sections, I analyze the social conditions of the epistemic process in the field of economic forecasting and examine the two dimensions of epistemic participation. Finally, I clarify the notion of epistemic participation, and I take a closer look at the relationship between the forecasters and the economy.

Forecasts as a special case of expectations

Economic forecasting can be interpreted as a special case of expectation building. A substantial amount of literature analyzes the connections between accounts of future states of the world and social action. The relevance of forecasts and expectations for the shaping of the present is examined in the sociology of expectations. Empirical studies in technology and innovation show that 'expectations influence the development of new artefacts and knowledge' (Pollock and Williams, 2010: 526) and that 'representations of the future have a far-reaching effect on the shaping of technology and knowledge' (Brown and Michael, 2003: 5; for a list of case studies on the role of expectations, see Tutton, 2011: 412–413).

These insights are connected to another line of research that focuses on the notion of the 'performativity' of expectations. While the concept of performativity is taken up in many different ways by various academic traditions, an often-overlooked source on the performativity of expectations is found in Merton's (1948) writings on the 'self-fulfilling prophecy'. Merton (1948) describes a situation in which a false definition of a situation causes actions, which then transform the false definition into an accurate one. A popular example of a performative claim is Moore's Law, which predicts an exponential growth of microchip power. 'This prediction turned out to hold so well that we may speak of a self-fulfilling prophecy. The fulfilling did not occur because it was a prophecy, but because actors have taken up the prophecy and acted accordingly' (Van Lente, 1993: 87; see also MacKenzie, 1996). In more recent work, the notion of performativity is applied to the sociology of finance. MacKenzie and Millo (2003) give an impressive account of the performativity of theoretical assumptions. They show how the Black–Scholes–Merton formula shaped a part of the financial market and argue that the formula did not simply describe the market but described it in such a way that the market accommodated to the formula (for further research, see Svetlova 2009).

Economists and economic sociologists are highly interested in expectations because they play such a crucial role in economic decisions. However, economists and sociologists often disagree about how actors produce expectations. Economic theory assumes that actors are guided by 'rational expectations' that are based on all available information, including individual goals and market pressures. This assumption is highly contentious, even within economics (e.g. Morgenstern, 1980). In recent economic sociology, authors have developed different approaches to explain how market actors produce these expectations. Some explain them in terms of networks, institutions, and cultural patterns (Fligstein, 1996; Granovetter, 1985). Beckert (2011) suggests understanding the formation of expectations as a function of existing 'fictions' that are

> parameters for decision making and thereby provide orientation despite the uncertainty inherent in the situation; at the same time, such fictions are a source of this uncertainty, because choices can bring about novelty based on counterfactual imaginations which motivate them. (p. 7; see also Beckert 2013)

Whereas the sociology of expectations and economic sociology are primarily interested in the efforts, consequences, and business of expectations (Pollock and Williams, 2010), I am more interested in the *production* of expectations. More precisely, I am interested in the scientific production of expectations about the economic future.

The narrow field of economic forecasting has not often been a topic of sociological inquiries. There is, however, much literature about the history of ideas in economics (e.g. Mirowski, 1985; Morgan, 1990; Schumpeter, 1939; Weintraub, 1991, 2002). Additionally, there are many accounts of the history of various economic forecasting institutes, with those in German-speaking countries being documented particularly well (for the German-speaking countries, see Beckmann, 2000; Coenen, 1964; Krengel, 1986; Kulla, 1996; Reichmann, 2007; for the Anglo-American region, see Fabricant, 1984; Fogel et al., 2013; Friedman, 2009; Jones, 1999; Rutherford, 2005). However, despite these historical perspectives, there is little further sociological research on the subject.

A notable exception is Evans (1997, 1999), who analyzes British macroeconomic modelers who support forecasters and thus play an important role in economic policy making and evaluation. He concentrates on the production of econometric models and on how economists decide between two or more models while bearing in mind that from a statistical perspective, the models are equally uncertain. He claims that a decision for or against an econometric model is a decision for or against specific economic theories. 'Although a macroeconomic model may tell us quite a bit about how economists think the world ought to work, it is clear that [...] it tells us very little about how the world actually works' (Evans 1997: 427). Moreover, Evans (2007) applied a theory of expertise he developed with Harry Collins (Collins and Evans, 2007) to analyze a small forecasting group. He concluded that the group members' contribution of 'different kinds of expertise and skills together make the economic forecasts plausible and worth using despite the statistical uncertainties that bedevil them' (Evans, 2007: 688–689). However, economic forecasting not only consists of econometric modeling. Quite the contrary, it has established a certain epistemic process beyond numbers, statistics, and econometrics that has not yet been investigated. Social studies of science lack good data about how economic forecasts are made. Furthermore, there is a gap in the theoretical understanding of how economics produces plausible knowledge about the future. This article contributes data for this process, imparting a better understanding to it.

The possibility of knowledge about the future: two theoretical concepts

In the previous section, I showed that sociological studies on expectations have not yet investigated how people produce their accounts of the future. In this article, I want to address this gap by studying a special case: how are expectations about economic

development scientifically constructed? One of the forecasters I interviewed gives us a general account of what is necessary to produce expectations about the economic future:

> Empirical quantitative inquiries are always based on a conception of a symmetry between what we observed in the past and what we will observe in the future [...] This is why it is so important to do these inquiries on the basis of, well, appreciations and experience – and also to have a story in mind that orders the thoughts and the various factors to consider. [...] and what I mean with story is a fundamental imagination of how the world will develop in the next three, four years, how the big fundamental driving forces take effect together and the global economy originates.

Where do forecasters get their 'appreciations', 'experiences', and 'stories' from? In this section, I present two theoretical approaches giving answers to this question. They provide a theoretical framework for grasping expectation building in sociological terms.

Broadly speaking, economic forecasting consists of three aspects. First, a forecaster produces a proposal for how the future could be. Second, the forecasters then negotiate with each other and with other stakeholders to produce a common view that takes all proposals into account. Third, during the previous two activities, the forecasters frame their activities as a scientific activity.

These three aspects can be understood theoretically using two sociological concepts. First, Alfred Schutz's (1959, 1967) ideas on how humans produce expectations help in understanding the process of producing views about the future. Second, what David Gibson (2011a, 2011b) calls 'foretalk' shows how different knowledges about the future fuse interactionally into a common view.

Producing possible futures

How do actors produce knowledge about possible futures? As argued by Emirbayer and Mische (1998), many analytical frameworks found in sociological theory lack a robust treatment of actors' orientation to the future. Sociological theory, Emirbayer and Mische (1998; see also Mische, 2009) argue, reduces the future to something that can be explained post hoc and can be rationalized afterward. Despite this overall tendency, there are social theorists who do include possible futures in their theories. Here I draw on the work of Alfred Schutz (1967), who explicitly treats the imaginative abilities of social actors. He theorizes that the fundamental units of human action can be conceptualized as the 'project' (Schutz, 1967: 57) and the 'projectivity' (Emirbayer and Mische, 1998: 985). Within Schutz's concept, two main arguments are important for a sociological understanding of economic forecasting. The first argument stems from Schutz's (1967) claim that the possible ways to see the future do not exist a priori. The future, one may conclude, has no preexisting ontology. Second, in Schutz's view, humans cannot really 'look' into the future. Nevertheless, they anticipate what will come, are interested in the course of the future, and aim to control it. In his work on the ancient Greek seer Tiresias, Schutz (1959) argues that the stability of the environment and the actor's knowledge that what worked well yesterday will also work tomorrow enable the actor to design projects for the future. Man in everyday life interprets his past, present, and future in terms of the pre-organized

stock of knowledge he has at hand at any moment of his existence' (Schutz, 1959: 76). Thus, Schutz's (1959) conception of the actor's imaginativity has two central points. The first is that an actor, in principle, can always access a 'stock of knowledge at hand that serves him as a scheme of interpretation of the past and present experiences, and also determine his anticipations of things to come' (p. 77). The second is that in everyday life, one can rely on the fact that experiences in the past will also be valid now and in the future (Schutz, 1959: 80). In other words, every project is based on knowledge about the past; it is based on the 'stock of knowledge at hand' (Schutz, 1959: 77).

Schutz's insights leave an open question: how can people who only access existing knowledge introduce something new? Knoblauch and Schnettler (2005) argue that Schutz's concept of fantasy enables humans to create or imagine something new. Other theorists, such as French-based post-structuralists, assume the potential new within the iteration. Iterations, they say, are never the same; they always deviate from each other, defer, and transform. Thus, even actors who intend to repeat produce something new (Derrida, 1988). Other theorists introduce certain concepts of creativity as the main source for imagining or producing something new (Joas, 1997; Reckwitz, 2012).

Producing a common future

From my point of view, the notions of fantasy, iterations, and creativity alone are not enough to provide an understanding of the social and interactional aspects of producing futures that go beyond the existing 'stock of knowledge at hand'. Here, David Gibson's (2011a, 2011b, 2012) concept of 'foretalk' is helpful in understanding the production of new possible futures. He argues that the talk between two or more actors about possible futures can be considered as 'foretalk'. Foretalk shapes decisions and works in two ways. First, it brings to light new possibilities that actors have not yet imagined. In contrast to the authors mentioned above, Gibson emphasizes the *interactional* momentum in producing new knowledge about the future. As we will see in the next sections, economic forecasters are permanently negotiating their views with each other and with others to come to a common view; in Gibson's words, they foretalk. Second, foretalk can be used to defend decisions after they are made. That is, actors may use what was said out loud during foretalk to justify their decisions.

Expecting scientifically

Economic forecasting can theoretically be understood as the creation of knowledge about the future using two sources: the preexisting, stable, reliable stock of knowledge, and the interactional momentum, the foretalk that is the source of new anticipations individuals could not construct alone.

Neither Schutz nor Gibson created their concepts around scientific forecasting. Schutz (1959) 'intentionally disregards [...] scientific prediction' (p. 76), and Gibson (2011a, 2011b) focuses on political decision making in extreme situations. Is it possible to use their concepts for scientific predictions as well? Although Schutz (1959) dealt with predictions in everyday life, it is possible to successfully apply his theory to scientific knowledge. As he says, the 'system of verified and tested propositions accepted in the

corpus of the particular science may be regarded as the stock of scientific knowledge at hand' (Schutz, 1959: 83). Thus, he equates the stock of knowledge actors can access in everyday life to the accepted knowledge within a scientific discipline, a scientific community, or in a paradigm. Although there are structural differences between scientific and everyday knowledge, Schutz's idea about how humans know the future is helpful to understanding processes of scientific forecasting.

Having clarified how, theoretically, scientific actors know the future and how they are able to anticipate something new, I now show how the theoretical ideas mentioned above become crucial in the case of economic forecasting, especially when I ask: who is 'foretalking' with whom?

Epistemic participation: foretalk between whom?

To adequately analyze the epistemic work involved in economic forecasting, I suggest using the term 'epistemic participation'. The term is based on Schutz's idea that anticipations of the future are generated using the 'stock of knowledge at hand' and further includes Gibson's concept of foretalk in which new possible futures are produced through interaction. My concept of epistemic participation emphasizes two aspects that are characteristic of economic forecasting, and it thus goes beyond the ideas of both Schutz and Gibson. First, during the forecasting process communication between actors with different kinds of 'knowledge at hand' is pivotal. Forecasters must foretalk with other actors who have different 'stocks of knowledge at hand' such as policy makers, economic actors, representatives of corporations or federal reserve banks, and so on. Second, the question of who foretalks with whom becomes crucial. Economic forecasters foretalk with representatives of the economy, giving them the chance to *participate* in the epistemic process of forecasting. This is the reason why I suggest calling the epistemic work of economic forecasters epistemic participation.

Studying economic forecasting in German-speaking countries

The field of economic forecasting

Before describing the forms of cooperation within the epistemic process of economic forecasting, I briefly outline the field of economic forecasting analyzed in this article.

There is currently a plethora of organizations publishing economic forecasts: banks, institutes on the financial markets, rating agencies, academic research units, etc. However, I am interested in the epistemic process of a specific kind of forecasting institute. I analyze work from so-called 'independent institutes' in German-speaking countries that share at least five common characteristics:

- They earn their money by producing both the economic forecasts and other forms of economic knowledge and do not need the forecasts for selling something else. Although banks and stock trading firms also produce economic forecasts, they produce them to sell stocks, bank accounts, and other financial products, or they use the forecasts as part of their customer relationship management.

- They are 'semi-official'; that is, their work is partly financed by other administrative units (such as ministries, interest groups, lobbies, and labor unions), and it serves as a basis for policy making. The forecasters and policy makers hold close, permanent, and well-established contacts with one another (Reichmann, 2009).
- They are 'independent'. Although they are linked closely to policy making, they do not belong to any political movement, company, interest group, or political party and have neither commercial nor political aims.
- Their forecasts are easily and publicly available and well distributed in the media.
- The forecasting institutes' members consider themselves to be scientists. They do not perceive themselves as consultants, businessmen, brokers, or traders. They have an academic identity and are part of the scientific community; their practices stick to the rules of economics (Evans, 1997: 408). However, although there is a strong identification with academia, the vast majority of these independent forecasting institutes are organized outside the universities.

The institutes are involved in a broad range of economic research. They do basic research on both methodological and theoretical questions, and they conduct studies on specific problems for paying clients. However, the forecasts are generally the most visible part of their work, and for some of the institutes, forecasts provide significant revenue. There are national differences between forecasting systems and the political uses of the forecasts, especially between the United States and Europe (Campbell and Pederson, 2011). In general, American forecasters are more commercially oriented whereas European forecasters are closer to the state (Friedman, 2009).

The appearance of economic forecasts in German-speaking countries is very standardized. They are published in two versions: a short text with a maximum of two pages, including a table showing the main economic indicators and a few points summarizing the main messages, and a paper of between 70 and 700 pages. Whereas the short publication is produced for the media and a broader public, the long one is addressed to a readership with an economic background. It provides diagnoses of past, present, and future economic developments; discusses assumptions underlying the forecast; includes methodological notes and statistical data; and sometimes contains recommendations for politicians and economic actors on how to react to the current economic situation. Depending on the institute, economic forecasts are produced between two and four times a year, and they are always presented at a press conference. The economic forecasts are made within the 'System of National Accounts'.[2] This is why the growth rate of the Gross Domestic Product (GDP) is at the center of every economic forecast. In brief, the GDP is the sum of all goods and services produced within a defined geographical region and a defined time period. In public discussions, economic forecasts are often reduced to the growth rate of the GDP; it is the 'star' among the economic indicators.

Methods

The data for this article were collected between 2004 and 2012. The work is based on a large volume of documents from all forecasting institutes in the German-speaking

countries and 35 qualitative interviews conducted in three forecast institutes in Austria and Germany. The interviews were conducted with the economists directly engaged in producing the forecasts. In addition, I interviewed users of the forecasts from national, regional, and local governments, special interest groups, and labor unions.

The interviews are a balance of structured and narrative interviews. This means that although I had a list of topics, I left the interviewees a high degree of freedom to speak about what they wanted. Whenever someone got too far off the topic, I tried to realign the conversation. The interviews lasted between 30 and 90 minutes, were recorded digitally, and were transcribed afterward. The interviews were conducted in German. I have translated the parts of the interviews quoted in this article faithfully.

A mixture of semi-structured interviews, intensive contact, and intellectual exchange with the interviewees is a good way to fulfill the requirements of a methodological approach that prefers 'engagement rather than detachment; contact rather than distance; interest rather than disinterest; *methodological intersubjectivity* rather than neutrality' (Knorr Cetina, 1981: 17). They enabled me to consider the constructivist side of the social world, to concentrate on the actors' perspectives, and to generate 'experience-near' concepts as the basis of an inquiry into epistemic procedures (Geertz, 1974). Naturally, there are other methods that would also have fulfilled these requirements, such as participant observation. However, there are several problems connected with this type of observation, one of them being that economic forecasting is located on the edge of policy making, an activity that prefers to close its doors to sociologists. Additionally, as I show below, part of the epistemic process of economic forecasting is continuous and on a transnational level, making it hard to observe in a practical sense.

The results presented in this article are mainly based on the qualitative interviews with the forecasters. The analysis of documents published by the forecasting institutes provides the background to the research topic in question.

Forms of cooperation between forecasters and the economy

There are a number of ways of producing economic forecasts (Tichy, 1994). They mainly differ depending on whether forecasters have more trust in numbers, quantitative data, and econometric models or whether they rely more on qualitative data gathered from representatives of the economy (Evans, 1997, 1999; see also McNees, 1990).

In all the years I have interviewed forecasters, I have never met one who purely relies on econometrics. Of course they use econometric models, but they see no way of producing a forecast without taking other data into account. In fact, econometric models play a minor role in producing an economic forecast. According to my research participants, the econometric models are taking more and more of a back seat. Indeed, the more important parts of the forecasting process now consist of something far beyond econometrics. They all agree with Evans' (1997) claim that 'macroeconomic models support forecasting activity, but do not actually produce forecasts' (p. 426). This revelation is surprising considering the public appearance of economic forecasts, which mainly consist of tables of numbers. Moreover, it leaves unanswered the question of how economic forecasts are *actually* made.

Following Goffman (1959: 111), people divide the space they use for their performances into a 'backstage' and a 'frontstage'. Two of the characteristics Goffman attributes to these different arenas are central to my argumentation. First, individuals use the backstage to get prepared for the frontstage. That is, the former is used as a preliminary stage to the latter. And second, the backstage is not public; there are restrictions to participation in the backstage. Those in the frontstage control who is allowed to access the backstage. This distinction between the two regions accurately conceptualizes the work of economic forecasters. The frontstage, as seen by the public at press conferences and in scientific publications, shows a scientific field that processes quantitative data, uses econometric models, and presents 'hard facts'. Economic forecasters publicly present numbers, econometric models, tables, and figures representing quantities. In this way, the frontstage is represented as a hard science.

In contrast, the backstage of economic forecasting is more complex than publicly acknowledged. The performances observed backstage have less to do with econometric models or with quantitative data at all. Rather, backstage is the arena where forecasters and others with different 'stocks of knowledge at hand' meet to foretalk and where what I suggest calling epistemic participation happens, that is, where the main epistemic process through which economists produce economic forecasts takes place.

This backstage has two dimensions that exist simultaneously and in parallel. I call the first dimension 'embedded participation'. It describes the huge network the forecasters are embedded in; there they gather and exchange information and foretalk with actors who themselves are embedded within additional networks comprising economics, the economy, and economic policy. I call the second dimension 'internal participation'. This dimension represents the relations between economic forecasters and their individual relationships to the economy. It shows that the forecasters have different 'stocks of knowledge at hand', which they access to produce a forecast.

When I describe the two dimensions and the ongoing backstage activities during the production of an economic forecast, I produce an ideal type of the forecasting processes in the three institutes in which I conducted interviews. Although the epistemic processes are not completely the same, they are very similar. In this article, I ignore any small differences and concentrate on the similarities.

Embedded participation: informal and formal

Economic forecasting does not take place in a social vacuum. Forecasters have developed numerous formal and informal communication channels and a permanent communication flow enabling them to contact those who represent, in one way or another, the economy. They build formal and informal platforms where they meet these representatives to gather data and information, and thus jointly produce knowledge about the economic future.

In actuality, the forecasters can only interact with a limited number of representatives of the economy. It is not possible for them to include everyone who is part of the economy in their network. Still, for the forecasters, their interaction partners seem to be intermediaries for the economy. When they talk about the network in which they participate, forecasters say things like: 'It is very important to speak with the economy'. Although

they cannot really speak to 'the economy' as such, they interpret their intermediaries as windows to 'the economy'.

Forecasters are embedded in a network that includes economists, business representatives, economic politicians, and members of the government and the state administrations. This network is a constitutive part of the epistemic process of economic forecasting. All members of the network are transformed from 'ordinary' communication partners to co-producers of the economic forecasts. Therefore, the network may be called an 'epistemic network'; it is an active part of the epistemic process. The forecasters do not just interview or observe others in the network; they give them the chance to coproduce the forecasts.

To describe this network, it is useful to differentiate between its nodes and lines. The forecasters are joined to two nodes: (1) other economists and (2) representatives of economic policy and the economy. Representing either formal or informal contacts, the lines' attributes also characterize the forecasters' networks. For example, these lines are currently getting longer, connecting the forecasters with others from an increasing number of foreign countries.

Other economists

Although forecasting institutes have conflicting ideas on scientific paradigms and economic competition, they frequently cooperate. They have formal meetings where both the directors and scientific staff from various institutes meet to discuss economic topics. Typically, these forms of cooperation are described as follows:

> The economic research institutes that publish the common forecast for the government arrange meetings [...] before they publish their common forecast. They want to talk in advance about how they see the current economic situation, this is more formal contact – and then there are, I think every member in our institute has also loose contacts to members of other economic research institutes but also to the Federal Reserve Bank, for example.

Another research participant expressed a similar form of cooperation:

> I just talked to a colleague who will go to the [name of a conference] in March. There, the German forecasters meet and form, so to say, an understanding of what the main factors are at the moment and the institutes have their own working committee [...] and we are also invited to their meetings.

In addition to these formal contacts (e.g. conferences and meetings), there are also informal contacts between the forecasting institutes. Forecasters know each other from a variety of activities and relationships developed outside of their formal work, such as from their time together as university students, from previous cooperations, from writing articles, or spending their free time together. All the forecasters have their individually formed network of 'foretalkers' and their personal sources of information within the community of forecasters.

Although the economic forecasting institutes in the German-speaking countries are not affiliated with the university system, economic forecasters themselves are part of

a dense network of researchers working at academic institutions. Contact with the universities takes several forms. For example, the forecasters regularly hold lectures at universities, they have project partners in university research projects, they coauthor papers with scholars from universities, and they even receive their *Habilitation*[3] from universities.[4]

There are several reasons for these close ties to universities: the forecasting institutes recruit new employees at the universities (Reichmann, 2010: 67), the network with academia helps sustain the forecasters' identity as scientists (Evans, 1997: 408), and the connection between universities and economic forecasters ensures reputation both on the individual and on the institutional level.

Politics and business

In the previous two sections, I described how economic forecasters regularly meet with other economists to exchange ideas, share new insights, and discuss problems, or in Gibson's (2011a, 2011b) words, to foretalk. As Evans (2007: 691) argues, these 'professional networks' are the source of certain types of expertise that help overcome the uncertainties of econometric models and help people judge between models. It is not surprising that researchers exchange ideas. It is something that may be familiar to most scientists. But the forecasters' epistemic networks include more than just economists who have a more or less homogeneous 'stock of knowledge at hand' they bring into the foretalk. There is also a group in the network consisting of policy makers who have a 'stock of knowledge at hand' that is different from that of the forecasters and the other scholars.

In this section, I describe the epistemic network's second group of nodes, consisting of policy makers and representatives of the economy. Economic forecasters describe this part of their network as the most important one. Indeed, they say it is more important than econometric models or academic conferences. It is a place where those who forecast future economic development meet to foretalk with those who create economic policy, shape the economic frame, and influence economic decisions.

Who are the policy makers in this case? When I speak of policy makers, I primarily mean members of governmental units, ministries, and federal banks. Additionally, the policy makers also include interest groups that bundle and represent the plans and interests of various economic actors: lobbies, labor unions, representatives of special interest groups, social partners, and stakeholders. The group of policy makers also includes representatives of big corporations because they also aim to shape the conditions and the framework for economic action.

To fully understand the role networking with policy makers plays in the economic forecasting process, it is helpful to retrace the route of the forecasting process. This route can be said to start with an econometric computer model and end with a press conference. In between, there are discursive activities (invisible to the public) that bring together many different actors with heterogeneous 'stocks of knowledge at hand' to foretalk with each other.

Again, I analyze the steps of the forecasting process separately, although, in practice, the order of steps is often unclear and the boundaries between them are blurred. In the first step, the forecasting institute autonomously produces a forecast, which is called a

'draft forecast'. This first step is dominated by applying econometric models, which are analyzed by Evans (1997, 1999) in detail.

Once this is done, a process of formal and informal discussions with experts from outside the research institutes begins. Depending on the problems on the political agenda, the forecasters contact specialized policy makers to discuss the draft forecast, to exchange their views on the ongoing economic development, and to explore the perceptions of every member of the policy-maker network. This process is generally not standardized. One of the members of a special interest group describes the permanent consultation between forecasters and his organization thus:

> There *are* consultations, there are even continuous consultations between us and these forecasting institutes. Of course, we do not influence the results, they are their own. But within this process of consultation, actually we are not the only one participating in this process, the tariff partners and the most important ministries are involved, in most of the cases this is an ongoing process, but one that practically comes to a head when the forecasts are actually produced. In fact, they ask us to give input, to make them *more true*. Actually, our insights, those of the economic chambers, and the ones of the Treasury, Federal Reserve Bank, perhaps Ministry of Economic Affairs, are extremely highly valued by the forecasters. Not to say that the insight of the others is less valued, labor unions and so on, but we do indeed have our own data, and we are very liberal with this information and we give it to the forecasters, and when they see that our insights are contrary to their forecast or their capital-investment-tests, they have to think of a response. Well, this is how it works. It is an ongoing process that obviously comes together four times a year. But I think, the real value lies in the ongoing consultancies. In this official meeting, to be honest, they tell us the forecast, and those of us who already know it and were somehow consulted during the preparations nod and the others watch, that's it.

About 1 week before the public presentation, there is a formal meeting where the forecast is presented to a small but significant group of policy makers. About 10 or so key policy makers from major political institutions take part in this presentation, discuss the forecast, and check its plausibility and the external assumptions. Normally those who participate in this meeting are also involved in prior discussions. However, this meeting is the first official and fixed date to give the same information to everyone. It is up to the forecasting institute to revise the forecast after this meeting, for example, if additional evidence or arguments arise.

Some hours before the forecast is presented to the public, it is shown to a bigger group of policy makers, typically about 40–50 people. At this time, none of the elements within the economic forecast can be changed. This meeting is an information and discussion forum that enables forecasters to gather information. Moreover, that the forecasters take their time to inform policy makers about the official economic forecast prior to releasing it to the public has political symbolism.

The complete preparation of the forecast takes about 2–3 weeks, but the networking and the meetings – the foretalk – constantly take place. The epistemic participants keep in permanent contact, thus ensuring that information on economic policy plans, on 'climate' changes between political actors, and even on shifts in the economic paradigm, flows continuously. As seen in the following exchange between two research participants, the forecasters actually describe it as an ongoing flow of information:

F1: [...] the European Union, they come to us and ask if we can meet for one afternoon or the 'Germany Desk' from the IMF comes here regularly to meet with us.
F2: Yes, whenever they have their consultancies in Germany with the Germans, they also visit us.
F1: And also from other Federal Reserve Banks, recently Norway was here.
F2: Norway, we meet regularly with the members of the office of the Japanese Federal Reserve Bank, um, they have an office in Frankfurt and they come [...] to exchange information about the recent economic situation.

Often, the dense network of forecasters and policy makers is misunderstood or wrongly interpreted as purely a question of political power and being able to politically influence the results and 'order' forecasts that fit political ideologies. However, it is really the economic forecasters who benefit most from networking with policy makers. In fact, the impact of these contacts with political actors on the quality of the epistemic process of economic forecasting cannot be overestimated. Political plans and actions affect the economic course, and the more forecasters know about policy makers' plans, the more likely the forecasts are to be accurate.

Although they are in general less important to forecasting than are policy makers, representatives of the economy itself, for example, CEOs, businessmen, and industrial lobbyists, are also involved. One forecaster describes these connections in detail:

> For business representatives we play a role as consultants, both for employees and employers. We conduct many concrete studies for them to answer any questions they are interested in. In the best case they order the studies together but we do it also for both sides separately. And we have close contacts with these guys. Most of the time we give informal advice, appreciations, presentations we give there [...] and the economy in the sense of businessmen [...] I think that the result of our monthly 'business cycle test' is important for their orientation [...] they get an idea of how others think about recent economic developments, [...] and how the whole branch sees the economic future. I think this is very important for corporations because they act in a fog of uncertainty, so to say, they don't know what happens around them. The more information they have, the more stable their expectations.

Formal and informal contacts

In the previous two sections, I showed how economic forecasters are embedded in a network with academic, political, and economic actors. The forecasters benefit from this network and, vice versa, the network itself benefits from the forecasters' knowledge. I call this network the 'epistemic network' of economic forecasting because, in fact, the forecast is not made in an isolated chamber but in a permanently ongoing process of meetings and discussions, in foretalk within a network of nodes with different 'stocks of knowledge at hand'.

In the next two sections, I focus on the lines between the nodes in the epistemic network. I argue first that there are formal and informal relations, and second, that catering to a globalized economy means these lines are getting longer and longer.

The foretalk between economic forecasters and others takes place in a wide variety of forums, including meetings and conferences, accidental chats, and in impromptu discussions at various occasions that range from formal official hearings to informal sports events. The formal meetings are part of the official foretalk during the forecasting process, are well organized, and are in part accurately documented with lists of all participating institutions: the Employment Agency, the German Central Bank, interest groups, the Federal Pension Insurance Agency, the Ministry of Health, the Ministry of Labor, Organisation for Economic Co-operation and Development (OECD), IMF, the European Central Bank, the European Commission, the German Federal Statistical Office, and so on (e.g. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (SVR) 2008: iv–v).

The informal information exchange takes place as a result of the forecasters' loose bonds and contacts with both other economists and policy makers. A forecaster describes where she gathers and exchanges information within the research institute:

> Well, we discuss, for example we have a facility in our institute which is called café. And we have lunch in the house and after lunch we meet each other or we go for a walk here in [name of a park next to the institute]. But after lunch we meet to have a coffee and this is the real discussion round. There one is informed; there is someone telling us what is happening within politics and the next one perhaps what he is currently working on. Actually, this coffee is a very important institution. Normally every scientist sits in his chamber, but for a coffee everyone meets and hears the things that are ongoing. This is, well, I think this is very important.

The informal contacts also connect members of different organizations. Normally, these contacts have grown over a long period of time and have their point of origin in past cooperations or common research activities. A member of a business interest group puts it as follows:

> Well, personally, I have a relatively large number of contacts because I was in [name of a research institute] and then in a private corporation, and we did a lot together, for example with the [name of a forecasting institute] and the [name of another research unit] together, and I know these guys on a personal level very well, and I still play soccer with them. Well, currently we do not have a joint project together. But that does not mean that this is not possible in the future.

What is described in the passage above is an example of how informal contacts are established and sustained. The interviewee worked in a research institute that cooperated with forecasting institutes. In the course of her activities there, she met some of the forecasters and established contacts. At the time of the interview, she was a member of an interest group, but still played soccer with the forecasters. The informal lines of the epistemic network of economic forecasting even reach into the private lives of the network members and may stimulate new research activities.

Network members also point out that the relationships between those in politics and economic forecasters are long-lasting and impossible for outsiders to understand. As stated by another member of an interest group, 'sometimes there are very special relationships, which have grown over time and which are really not easy to explain'.

Forecasters describe many advantages of these informal contacts. They value the use of 'short routes' for exchanging information with relevant institutions and learning about others' perspectives on the economic development. And they prefer personal contacts because the relationships are based on trust. Normally, the contacts are with members of different organizations established with people at similar hierarchical levels. The directors know the directors, the scientists know other scientists, and statisticians know statisticians. Furthermore, these informal contacts depend highly on individuals and are hard to pass on to successors. This dependency means that they are in a state of permanent flux, and whenever a new forecaster enters the arena, old contacts vanish and new arise.

I emphasize the informal part of the network because it is at the heart of economic forecasting's epistemic work. The forecasters permanently use these informal situations to foretalk with actors from different arenas, and it becomes clear that foretalk can take place in countless forms. The social setting of the backstage of economic forecasting is mainly characterized by these informal contacts.

International information flow

Economic globalization makes forecasting more difficult because the number and locations of influential factors are increasing. As forecasters are increasingly forced to make assumptions about global developments, they have responded by internationalizing their epistemic network. They have built a transnational forecasting community that – in one way or another – participates in every forecasting process. Both foretalk and epistemic participation have gone global.

Again, the forms of global epistemic participation are manifold. Periodically, economic forecasters participate in transnational meetings and conferences. Furthermore, there are associations and institutionalized platforms where forecasters meet both each other and representatives from the economy and economic policy.[5] There are also international organizations, such as the International Monetary Fund and the World Bank, which have economic units that produce forecasts and are part of the international network. All of these organizations are in permanent contact and publish forecasts on the basis of the results of the transnational network.

How does global epistemic participation on a transnational level work in detail? How do stakeholders foretalk globally? A closer look at the meetings organized by one of the transnational forecasting platforms (called Association d'Européens de Conjuncture Economique (AIECE)[5]) can answer these questions. Founded in 1957 by the directors of institutes in France, Germany, and the Netherlands, AIECE produces joint short-term forecasts. In the course of time, AIECE's activities and tasks have increased and several close cooperations between institutes have resulted from this association (Krengel, 1986: 135). Today, forecasting institutes from about 20 countries participate in AIECE's biannual meetings. One of the forecasters describes these meetings:

> Well, in these meetings, there is always one forecasting institute that is responsible for delivering this so-called report, that means, it sends in advance to all the other participating forecasting institutes in the network questionnaires on how they assess questions of the recent development

> of the business cycle, how they evaluate the state of the economy at the moment, also with forecasts and so on. And this institute writes a summary out of the responses of the other forecasting institutes. And then this report is discussed for two days. This is how it works. [...] There is this, there are always working groups on Wednesday and Thursday. Friday is the forecast-day. On Wednesday there are always working groups, mid-term development and so on. And on the last half-day there are some key aspects. But at least one and a half days are always dedicated to discussions about the business cycle and about this report.

These AIECE meetings differ from common academic scientific conferences. Before the meetings take place, one of the member institutes collects data about the views and expectations of the other forecasting institutes and prepares a summarizing report, called the 'Rapport Général' (Krengel, 1986: 136). During the conference, the institutes discuss this report and justify the exogenous assumptions from their national perspectives, enabling the forecasters to have a transnational view. This is an example of transnational foretalk.

Today, both foretalk and epistemic participation have gone global. In practical terms, this has made the epistemic process into a big business. The number of people who are part of what forecasters define as the economy has increased enormously. Therefore, the epistemic process has become more complicated. Not only has the number of talks, meetings, chats, conversations, and negotiations increased, but the number of places where the epistemic process takes place also has grown enormously.

Internal participation: negotiation, iteration, and embodiment

To summarize all performances found in the backstage of economic forecasting, I have suggested using the notion of epistemic participation. In this section, I describe its second dimension, which I call 'internal participation'. Thus, this section is a complement to the previous one, where I studied what I call 'embedded participation'. Whereas embedded participation describes how economic forecasters produce their forecasts within a network of economists, policy makers, and economic actors, internal participation explains how the forecasters take the economy to their offices, let the economy be part of their work, and organize the internal process of producing a forecast. Here again, both the foretalk and the economy are an integral part of the epistemic process of economic forecasting.

The typical internal participation in a forecasting institute consists of five roles played by five economists. Each of them is responsible for a specific part of what they call the economy. The first economist is responsible for public finance and the government's budget, the second focuses on the labor market, the third studies fiscal policy and inflation, and the fourth is responsible for foreign trade. The fifth role is the most important because it includes responsibility for the national economy and gathering and summarizing all the data, arguments, and information collected by the other economists. It refers to the 'single person' Evans (2007) also found in a group of econometric modelers, the one who 'integrate(s) the disparate inputs and make(s) judgments about the wide range of factors that have impacts on the national and international economy' (Evans, 2007:

688). The five topics represented by these five economists are the so-called main aggregates of the economy (Tichy, 1994).[6]

During the first step of the internal process of producing a common economic forecast, each of the five economists individually compiles a forecast for his or her special topic. Using both quantitative models and additional information gathered during what I described as 'embedded participation' in the section above, each of them produces numbers, creates interpretations, and thinks about the assumptions underlying their results. One of the forecasters interviewed makes an interesting remark about this phase:

> Our colleague [...] often deals with numbers. He finds out what was actually done [in financial politics] and summarizes the hard data and facts, asks: what is the fiscal impulse? and starts certain quantitative programs to – so to say – *get a feeling* for what the present development may cause at the end of the year [...]. (author's emphasis)

This first step is not just to produce a first forecast but also to 'get a feeling' for 'their' part of the economy. When another research participant talks about his colleagues who forecast public finance and tax income, he also points to their 'feelings'. He emphasizes the role of experience necessary to develop the right 'feeling' for their special topics:

> Yes, there are those guys in the budget section and the tax section; they have their own *feeling* for their topic because they do that for a very long time. (author's emphasis)

Here again, the minor role of econometrics and quantitative models is revealed. They are just used as a starting point – in this example, as a starting point for developing the right 'feeling' for the future – but in the further process of producing a forecast, they vanish.

Having produced this first individual forecast, the five forecasters then meet to discuss their results. In this second step, they exchange data, discuss their aggregate-related forecasts, and describe and justify their assumptions. During these discussions, they try to align their forecasts. They try to create a forecast with no internal contradictions. One of the forecasters describes what happens in this step:

> And if someone sees 'Okay, this doesn't fit here and there', we just start again and take the information from the others and go back to our offices and we begin to re-calculate – we cut off the corners to make the calculations fit – we call it *Rundrechnung*.

After the common discussion, they go back to their own offices with the information and arguments from the other forecasters. They work by themselves again and try, for their respective topic, to produce a new prognosis that is in line with the views of the other four forecasters. After a while, they meet again to discuss their results. The forecasters repeat this process many times – it takes about 2–3 weeks.

The forecasters call this part of the forecasting process *Rundrechnung*. It is a phrase that is barely translatable. A literal translation of *Rundrechnung* may be 'round-calculation' or 'circle-calculation'. It summarizes the process of several readjustments of the common forecast until it is a smooth and 'round forecast'. This notion describes accurately how economic forecasters adjust, readjust, and re-readjust their results until

the overall forecast is a ‘round image’. To them, this means that the components of the forecast fit together, that it appears theoretically harmonious, and that there are no internal contradictions in the image the forecast provides. A ‘round image’ has no more corners disturbing the appearance of the forecast.

Again, the process described here can be understood as a repeated foretalk of actors with different ‘stocks of knowledge at hand’. Every economist is specialized in one aggregate of the economy and experiences the economy from a certain perspective. They come together to interactionally produce a common view that would not be brought to light by any one alone.

Negotiation and iteration

At the beginning of the economic forecasting process, there are quantitative data, econometric models, and forecasters embedded in a network with other economists and policy makers who provide them with data and information about the economy. At the end of the forecasting process, a quantitative entity, the GDP’s growth, is the center of attention. Between these two points is a process full of negotiation. Although the final product of every forecasting process is a number (or a series of numbers), the main epistemic process includes a discursive process, what Knorr Cetina (1981) calls ‘consensus formation and solidification of knowledge’ (p. 60). This is a phenomenon found in many scientific disciplines, and it shows that the economist is not a passive observer of the economy, but an active participant in its constitution.

Furthermore, the economic forecast is the product of an iterative process of adjustment, readjustment, and re-readjustment on the basis of econometric data and, more importantly, information gathered during embedded participation. In this case, iteration means that the forecasts for parts of the economy are modified cyclically until the individual forecasts fit together to represent the whole economy. One of the forecasters describes it as an iterative process and explains when a forecast is ‘round’:

> Well, we are in this iterative process, and we meet again and look: well does that now fit together? I mean, it is not possible to fit increasing prices with an extreme break down of production or something like that, that wouldn’t fit together [laughs] – then we would have different scenarios in our heads and they can’t be put together to *one* forecast.

This iterative process is repeated for 2–3 weeks with the aim of bringing together the different ‘scenarios’ the forecasters have in mind and achieving a ‘round’ forecast. Iteration means that the negotiating parties try to get closer and closer to each other’s forecasts and, in the end, produce a common ‘round’ forecast. Thus, this procedure is close to Derrida’s (1988) idea of iteration; the iterations always differ from each other and produce something new in the end.

Embodiment

When I asked one of the forecasters to describe the forecasting process, she used a surprising expression. She said, ‘We are the model!’ She was describing the fact that

forecasters show a high level of identification with the part of the economy for which they are responsible. I suggest calling this phenomenon the 'embodiment' of the economy. The forecasters embody the special topic they are responsible for.

Varying phenomena of embodying knowledge and scientific models are found in several social contexts. For example, Laube (2012) shows how financial market actors use their bodies to observe systematically and interpret volatile prices; he interprets the body as a comprehensive somatic observation and communication tool. In the context of the natural sciences, Knorr Cetina (1988) conceptualizes the body as an instrument for processing information within the scientific laboratory. Myers (2008, 2009) observes how chemists interested in protein molecules perform and embody models of folding proteins when teaching the invisible process of protein folding to students and thus enabling them to get a 'feeling' for the protein molecule. The researchers do not represent or mirror the object with their bodies. Rather, they actively perform their scientific knowledge and the images they have in mind of the invisible object taken out of nature (Myers, 2009: 185).

Similarly, economic forecasters produce a final result through a process of social interaction in which they embody their specific topic; they act and speak for it. From this perspective, it is no longer the economists who discuss with each other. Rather, it is the five main aggregates represented by economists that are doing the discussing. That is, the economists represent their topics and give them their voice and body. In this case, the economy, or, to be precise, a certain concept of the economy, participates in the epistemic process by occupying the forecasters' bodies and voices.

'Internal participation' is the second constitutive dimension of the epistemic work of producing economic forecasts, and from the perspective of the social studies of science, it is remarkable for three reasons: first, it is a process of negotiation, which is a 'central analytic resource [...] for social constructivism' (Knorr Cetina, 1993: 81); second, it is an iterative process, which is interpreted as a mechanism for (re)producing both stability (Emirbayer and Mische, 1998) and innovation (Derrida, 1988); and third, both negotiation and iteration take place between economists who embody the economic aggregates for which they are responsible. Thus, I interpret the internal forecasting process as an iterative negotiation between embodied parts of the economy.

Epistemic participation and the subject–object relationship

In the final sections of this article, I aim to clarify the term 'epistemic participation' and interpret it as a particular relation between subject and object, one that can be found mainly in the social sciences. The economists (who may be called the scientific subjects) offer the economy, which I treat here as a scientific object, the chance to *participate* in the epistemic process – this is why I suggest using the notion of epistemic participation to summarize the forecasters' activities.

Especially for the natural sciences, traditional philosophies of science assume a strict division between scientific subject and object. The popular assumption that the natural sciences adhere to a strict division between subject and object was challenged in the 1970s and 1980s by laboratory ethnographies that showed how the scientific laboratory can be considered a space in which both subject and object are

reconfigured, and where the natural order of objects and the social order of subjects intertwine (Knorr Cetina, 1981, 1995; Latour and Woolgar, 1979). However, the notion of epistemic participation goes beyond this intertwining. Physicists and atoms do not play soccer together or even go out for a beer after a hard day in the laboratory. They do not try to exchange their heterogeneous 'stocks of knowledge at hand' (Schutz, 1959) and 'foretalk' (Gibson, 2011a, 2011b) with each other to produce a *common* view on how to behave in the future. Thus, there are peculiarities of epistemic participation. First, it describes the close relationship between the researcher and the object being researched, a relationship that is so close that the boundaries between the two entities seem to blur. Second, it shows that epistemic participation only works in scientific fields with a highly reflexive object. In the case of economic forecasting, we can observe a certain reconfiguration of scientific subjects and objects, between the forecasters and what they call 'the economy'. In this reconfiguration, what appears from the outside to be a clear separation between the economy and forecasters becomes diaphanous, unclear, and, in some phases, invisible.

Let me compare epistemic participation with four other social scientific concepts focusing on their subject–object relationship. This comparison clarifies how I interpret the economic forecasters' relationship to their object. (1) Evans (2007) shows that the practices of macroeconometric modeling depend on several sources of expertise to counterbalance the uncertainties of the assumptions and the estimates on which the econometric models are based. He argues that the modelers 'use' this expertise to produce forecasts. Epistemic participation goes far beyond the pure 'use' of expertise. It emphasizes the active role of the object within the epistemic process and its chance to contribute to the final results. It contributes the object's interpretations of its present state and expectations of future development, and it involves the subjects taking over the object's notions and orders. In turn, the subjects tell the object their results and inform it about its future. This is more than just 'using' someone's expertise. (2) Epistemic participation also means more than the traditional division of labor often found within research organizations, because this division means that complementary processes are distributed to a number of producers. As a result, the product itself does not contribute anything to production processes. In contrast, in epistemic participation, parts of the production process are shared with the product itself. (3) Ethnographic fieldwork is also a research methodology with a close relationship between subject and object. Although ethnographic 'analysis penetrates into the very body of the object', Clifford Geertz (1973) strictly defends a border between the 'object of study' and 'the study of it' (p. 15). Its main difference to epistemic participation is that the final result, namely, 'culture as a theoretical entity', is a product made solely by the ethnographer and written in the ethnographers' language. The object in the ethnographer's case does not take active action in the epistemic process. (4) An Actor–Network Theory-inspired sociologist might argue that natural objects also speak through the scientists' inscriptions, resist demands from the scientist, and actually shape scientific knowledge (e.g. Callon, 1986). Still, I want to point out here that epistemic participation includes the economy's active understandings and expectations, which exist independently of any economist forecaster.

To define it one more time, epistemic participation should be understood as a form of producing knowledge about an object that aims at the object itself *participating* in the

epistemic process. It is the inclusion of an active scientific object in the epistemic process.

Conclusion

Certain situations during the described forecasting process indicate that economic forecasters use epistemic participation. First, to predict economic development, the forecasters allow policy makers and business representatives to participate in the forecasting process and ask them to be a part of the epistemic process. This involvement means that those who represent the object, the economy, are part of the epistemic process. Epistemic participation goes beyond the forecasters just observing the economy. It becomes a constitutive part of producing, analyzing, monitoring, and controlling the forecasting knowledge. Second, the borders between object and subject blur during what I call internal participation. During their *Rundrechnung*, the forecasters metaphorically 'are' the economy. Forecasters define their object as the sum of five aggregates. The aggregates have been calculated by individual economists who have 'absorbed' the economy into their bodies. By saying 'We are the model!' they verbalize this aspect of their very close subject–object relationship.

Epistemic participation is not possible with every kind of object. To participate in the epistemic process, the object must show a high degree of reflexivity. It must be able to think about itself, its past and present position in its environment, and about possible future developments; to follow Schutz (1967), it must possess a 'stock of knowledge at hand'. Furthermore it must be self-aware of its relations to others and possible influences, and object and subject have to be able to communicate. They have to develop a common language and a common understanding of the main notions they work with. Furthermore, Collins (2010) points out that the meaningful use of language is a precondition of acting in the way humans do. To me, this seems to be a condition for epistemic participation as well.

Where does epistemic participation leave social studies of science? At the moment, it leads to a number of further questions not yet tackled. First, in this article, I analyzed epistemic participation solely as an intra-scientific strategy. However, one could also find functions or connected phenomena outside the scientific sphere. There, questions of the legitimation and credibility of the forecasts may play a significant role. Second, it is still unclear whether epistemic participation is only possible with objects within the social sciences. Third, epistemic participation emphasizes cooperation, interaction, and common foretalk (Gibson, 2011a) instead of domination, warfare, and conflict. However, social life is not always as harmonious as my case study may suggest. Where are conflicts, power, and interests in the epistemic participation model? Fourth, in this article, epistemic participation was observed in a scientific field that produces knowledge about the future, namely, the future of economic development. Knowledge about the future is a very special case because of its uncertainty, the difficulties associated with researching it empirically, and the numerous ways of discussing it. This means that whether or not epistemic participation is a characteristic phenomenon of producing expectations, projections, and forecasts remains an open question.

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Notes

1. Even within the economic forecasting community, the recent financial crisis stimulated a discussion about the possibility of economic forecasting. For a summary of the academic debate, see Tichy (2010). The public discussion about the possibilities, limits, and necessities of economic forecasts in German-speaking countries was started by the former president of a famous forecasting institute in Berlin, Klaus F. Zimmermann. His arguments and many reactions are summarized in Koll (2009).
2. The *System of National Accounts* is published by the United Nations (UN) and provides the internationally standardized conceptual frame for counting and processing economic action. See more at http://unstats.un.org/unsd/nationalaccount/
3. In German-speaking countries, the Habilitation is an academic degree after a doctorate. In some scientific disciplines, it is a requirement for becoming a full professor.
4. Fine's (2007: 57–97) ethnography of weather forecasters shows that the relationship between academic and applied researchers can also be much more controversial.
5. For example, Association d'Européens de Conjuncture Economique (AIECE), European Forecasting Research Association for the Macro-Economy (EUROFRAME), National Economic Research Organization (NERO), and Euro Area Business Cycle Network (€ABCN).
6. Here, it becomes clear that what forecasters define as 'the economy' depends highly on the system of national accounting (see Note 2). Of course, there are many topics and areas that are not included in their definition of the economy but do constitute economics from a broader understanding, such as illegal employment, black markets, 'neighborly help', work of reproduction, prostitution, environmental pollution, and so on. For an excellent historical analysis of how economics shapes the understanding of the economy, see Schabas (2005).

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