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Social Interaction, Emotion, and Economic Forecasting

Abstract: From the perspective of traditional philosophies of science, economic forecasts may be perceived as the results of purely rational reasoning, applying scientific theories, and econometric modeling. Yet, a sociological view on economic forecasting shows that economic forecasts mobilize more than these conventional epistemic resources. First, economic forecasters are embedded in a huge interaction network including different kinds of economists, policy makers, and representatives of the economy. In the epistemic process of economic forecasting, this network actively helps improve the forecasts in (at least) three ways: it helps forecasters to produce new imaginaries of the economic future and to discover emerging developments, it increases the forecasts' social legitimacy, and it produces a common view on the economic future that helps to decrease uncertainty in markets. Second, economic forecasters mobilize emotions that help them to overcome the shortcomings of quantitative data, statistics, and econometric modeling: they develop a feeling for numbers – and numbers support them in developing a feeling for the economy – they have to control their emotions to keep cool when the economy or politics confronts them with increasing dynamics, and they are impassioned about their work. Drawing on data gathered in numerous economic forecasting institutes in Germany, Austria, and Switzerland, I argue that the main resources in producing credible and accurate economic forecasts consist of various forms of social interaction and the mobilization of emotion.

Keywords: Economic forecasting, economics, emotion, interaction, social network

1. Introduction

Modern capitalistic economies are future-oriented. To be successful in such an economy, economic actors manufacture knowledge about possible futures of the economy, and they aim at bringing their plans, strategies, and actions in line with this knowledge. The main challenge in this endeavor lies in the future in general (including the economic future) being open. Thus, producing scientific knowledge about the future is a radically uncertain process. This chapter asks how one specific kind of actor – the

scientific economic forecaster – resolves this challenge and forms legitimate knowledge about the economic future, how this actor builds expectations and produces economic forecasts.

This chapter argues that there are two epistemic resources helping economic forecasters bridge the gap between present and future. First, drawing on the notion of “epistemic participation” (Reichmann 2013), I argue that interaction between economic actors, economists, and policymakers compensates for the radical uncertainty of the future. And second, I introduce emotion as another epistemic resource. Both notions, interaction and emotion, underline how the formation of economic expectations – even scientific ones – unfolds in a social environment.

Using interaction and emotion when producing economic forecasts has some main advantages. First, embedding the production of economic forecasts in social networks sharpens economic forecasts in three ways: it brings to light *novel imaginaries* about the economic future, it ensures the forecasts’ social *legitimacy*, and it *stabilizes the view of the future*. Emotion is also being used as an epistemic resource. As data, models, and econometrics are not as unequivocal as some may hope, forecasters have to “add” something; they supplement them with different kinds of feelings, coolness, and passion.

The paper’s arguments are illustrated by using empirical data from a case study involving economic forecasters in German-speaking countries. Their forecasts are a special case of expectations about the economic future: the forecasts are made under the constraints of (and in alignment with the rules and methods of) scientific work; they are expectations based on theoretical approaches and methods from economics.

Two assumptions underlie this chapter. First, we cannot predict the economic future. Whereas some elements of the economy count as ergodic and are governed by causal mechanisms and stable regularities, other parts of the economy are non-ergodic, transmutable, and undetermined (Davidson 1996). To date, no scientific discipline has developed a method, an apparatus, or an experimental arrangement to access these non-ergodic, and hence unknowable, elements of the future. The second assumption is that – irrespective of assumption one – economic agents (have to) predict the future. This chapter asks how economic forecasters handle the gap

between these two assumptions and what they do to compensate and supplement for the implications of the economy's non-ergodic side. I argue that this gap is bridged by interaction and emotion.

1.1. The Field: Economic Forecasters in German-Speaking Countries

Before I present my results, I have to clarify which empirical field I am talking about. Nowadays, numerous organizations publish economic forecasts: banks, financial institutes, rating agencies, academic research units, etc. The institutes examined in my research share at least four common characteristics. First, they earn their money exclusively by producing economic expertise (for example, forecasts) and do not use forecasts to sell something else. Thus, as an example, banks are excluded because they use their forecasts to sell other services or use them as part of their customer relationship management. Second, the institutes are called "semi-official": their work is partly financed by the government, and it is institutionalized within the policy-making process (Reichmann 2009). Third, they are "independent" in a specific way: they do not belong to any political movement, to a company, an interest group, or a political party and have neither commercial nor political aims. And fourth, the forecasting institutes' members consider themselves to be part of academia: they have an identity as academic scholars and do things only scholars do (for example, giving courses at universities, earning their *Habilitation*, and so on) and their practices stick to the rules of economics' methodology (Evans 1997, 408). However, despite their academic identity, the vast majority of the forecasting institutes analyzed in this paper are organized outside universities.

Another important clarification is that, in German-speaking countries, the growth rate of the Gross Domestic Product (GDP) stands at the center of every economic forecast, and, especially in public discussions, it is what economic forecasts are often reduced to. The forecasts under research are very different. Most of them contain about one hundred pages. Others are part of reports of about 700 pages. Forecasts are summarized in short press releases showing the main economic indicators and a few points outlining the main messages. The institutes publish economic forecasts two to

four times a year, and most of them present their forecasts to the public at press conferences.¹

The article is divided into two parts. The first one shows how different kinds of social interaction enable forecasters to produce knowledge about the economic future. In the second one, I analyze how they mobilize emotion as an epistemic resource. It starts by presenting two theoretical concepts that help in understanding how actors use interaction to produce expectations and assumptions about the future. Then I describe and analyze the social conditions of the epistemic process in the field of economic forecasting and examine the two dimensions of “epistemic participation” in detail. In a final section, I take a closer look at the role emotion plays in producing economic forecasts.

2. Interaction and the Future

In his classic definition, Erving Goffman states that “[s]ocial interaction can be identified narrowly as that which uniquely transpires in social situations, that is, environments in which two or more individuals are physically in one another’s response presence” (Goffman 1983, 2). In the 21st century, Goffman’s “body to body starting point” (Goffman 1983, 2) of interaction must be reformulated because new technologies enable humans to interact and form social situations without being bodily co-present. Nevertheless, Goffman’s main point remains useful: interaction is a reciprocal social action of two or more individuals. Each interaction partner orients his or her actions towards the past, present, or future actions of the other partner(s). In Goffman’s understanding, interaction does not have to be reduced to oral speech; although speaking is a common element

1 The data used in this paper were collected starting in 2004 and (at the time of writing this paper) consist of 42 qualitative interviews (30–100 minutes) with economists directly engaged in producing the forecasts, which are used by national, regional, and local governments, special interest groups, and labor unions. In addition, I spent some time at different forecasting institutes taking notes and have collected a large volume of documents from all forecasting institutes in the German-speaking countries. The interviews were conducted in German and translated by the author. Quotes from the interviews are marked “Interview,” followed by the number of the interview and a time stamp.

of interaction, it is not a prerequisite. However, human interaction does include a consensus on a common immediate goal of action, a common definition and understanding of the situation, and it is embedded in a complex interaction order. It also plays a significant role in the process of producing expectations about possible futures.

In the following sections, this paper briefly introduces two theoretical concepts – “mental time traveling” and “foretalk” – that stem from different scientific fields but come to a common result. These concepts help us to understand how actors produce assumptions about the future by emphasizing the underlying interactional element of forecasting.

2.1. Mental Time Traveling and Foretalk

Thomas Suddendorf’s work on the development of mental capacities in young children and animals provides an interesting view on how humans interact to imagine the future. Initially, his approach may seem to be slightly a-sociological, but, on closer inspection, it acquires an interactional element.

Suddendorf focuses on the question “What makes humans unique?”. In his book *The Gap* (Suddendorf 2013), he identifies eight main differences between humans and animals: one of them is that humans are able to do what he calls “mental time traveling,” that is, mentally form expectations and stories about the future. It is one of the fundamental human capabilities to imagine the future; and no other being in the world is able to “recall past episodes and imagine future events, including entirely fictional scenarios (such as the invention of an actual time machine)” (Suddendorf 2013, 89).²

Suddendorf argues that “mental time travel into the past and mental time travel into the future are two aspects of the same faculty” (Suddendorf 2013, 90). He refers to brain imaging studies that “have found that when participants are asked to recall past events and imagine future situations, the same areas of the brain [...] are involved” (Suddendorf 2013, 94). In a second step, he argues that the human imaginative capacity, no matter

2 The claim that only humans have the preconditions for “mental time traveling” is challenged by biologists and animal researchers such as Clayton et al. (2008).

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whether about past or future events, is divided into three systems: a memory for how to do things (procedural memory), a memory for facts (semantic memory), and a memory for events (episodic memory).

Episodic memory is not just responsible for us remembering past experiences, it also produces and imagines futures (Suddendorf 2013, 91). Humans use episodic memory in several ways to produce imaginaries. Of course, they use experiences from the past to construct futures. However, they are also able to imagine situations they have never experienced before. There is almost no limit to possible situations humans can imagine and, interestingly enough, humans can even evaluate these fictional situations (Suddendorf 2013, 95).

The problem is that episodic memory is well-known to be error-prone, no matter whether we use it oriented towards the past or the future (Suddendorf 2013, 98 ff.). But – and this is the more sociological aspect of Suddendorf’s argument – humans have developed a unique technique to increase the quality of their episodic memory and their “mental time travels,” namely interaction. As Suddendorf states, “we have radically improved our chances of getting it right through a wonderfully effective trick: we share our plans and predictions with others [and] we have an extraordinarily effective way of exchanging our mind travels through language [...]” Suddendorf argues that, by “exchanging our experiences, plans, and advice, we have vastly increased our capacity for accurate prediction” (Suddendorf 2013, 99).

Suddendorf is an evolutionary psychologist. As such, he argues that both the ability to mind-travel and the ability to share real and fictitious stories about the past and the future with others interactionally increase the chance of survival. For him, it is an advantage in evolutionary competition to be able to create mental images for possible futures and thereby control the future better (Suddendorf 2013, 101–3).

David Gibson (2011b, 2012) also emphasizes the interactional element of imagining the future, and, by asking how this interaction is shaped in microsociological and conversational detail, he comes to two conclusions that enrich Suddendorf’s argumentation. He refers to interaction about possible futures using the term “foretalk” – a combination of forecasting and talk (Gibson 2012). He focuses on conversation and decision-making under extreme circumstances; in other words, on “talk at the brink.” As

an example, he analyses the process of decision-making during the Cuban Missile Crisis in 1962, when President Kennedy and his top advisers had to decide within a couple of hours how to react to the Soviet Union's installation of nuclear missiles on the island of Cuba (Gibson 2011a). In such extreme situations, people create possible future scenarios together by "foretalking" (Gibson 2011a). This group "foretalk" shapes decisions through two mechanisms. First, "foretalk" brings to light possible futures that might not otherwise have been imagined. Thus, "foretalk" is an epistemic resource that enables us to produce new imaginaries of the future. Second, decision-makers anticipate the need to legitimate their decisions afterwards. The "foretalk" helps to justify decisions and improves their legitimacy.

Both Suddendorf and Gibson emphasize the interactional basis of producing knowledge about the future. They show that the production of possible futures, for example, about economic development, does not take place in a social vacuum – it is not a purely mind-centered skill. It follows that concepts such as fantasy, creativity, mathematics, or cognition alone are not enough to provide an understanding of how fictional expectations are constructed. There are social and interactional aspects of producing economic futures that go beyond the "reserve stock of knowledge" (Schutz 1967, 77) that individual people have accumulated and can access. Economic forecasts are based on an interactional process.

3. Interaction and Economic Forecasting

The ways in which economic forecasters generate a common view by constantly negotiating their views with each other and with external groups – how they "foretalk" and how they exchange ideas from their "mental time travels" – can be elucidated empirically. Economic forecasters produce their forecasts using several channels of interaction as part of their epistemic process. To avoid misunderstandings, it is important to emphasize that this paper focuses on forecasting institutes in German-speaking countries, which operate quite differently from, for example, forecasting institutes in the United States or in the UK. There are national differences between forecasting systems and the political uses of the forecasts, especially between the United States and Europe (Campbell and Pedersen

2014). In general, one could say that American forecasters are more commercially oriented whereas European forecasters operate closer to the state (Friedman 2009, 2014).

3.1. Interaction and Econometrics

Textbooks show different ways of producing economic forecasts (e.g., Döhrn 2014; Tichy 1994). They differ mainly in terms of whether forecasters have more trust in numbers, quantitative data, mathematics, and econometric models or whether they rely more on qualitative data gathered from representatives of the economy (Evans 1997; McNees 1990).

In practice, forecasters never rely solely on calculation. Econometric models are used merely as a starting point. And these models are increasingly taking a back seat in the process of manufacturing a forecast. In fact, econometric models play a fairly minor role in producing economic forecasts, and the interviewees for this study agreed with Evans's claim that "macroeconomic models support forecasting activity, but do not actually produce forecasts" (Evans 1997, 426).

Instead of econometrics, the more important parts of the forecasting process consist of various forms of interaction with various interaction partners. Interaction can be either informal or more institutionalized (see also Reichmann 2013, 861–67), and the interaction includes both internal partners (such as colleagues from the same institute) and external ones (such as academic economists and representatives of "the economy"). Forecasters have developed numerous formal and informal interaction 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 an image of the economic future. Economic forecasters supplement the human capacity for "mental time traveling" to imagine possible futures using the "trick" (Suddendorf 2013) of sharing their predictions with others to obtain information about their respective views of and alternative perspectives on the future. Furthermore, forecasters "foretalk" (Gibson 2011b) with selected interaction partners in several ways, thereby ensuring that economic forecasting does not take place in a social vacuum.

This paper emphasizes three reasons why forecasters engage in foretalking with various representatives of economics and the economy: novelty, legitimacy, and stability. First, foretalking enables forecasters to entertain possible futures and spot emerging developments they would have missed without the foretalk. They use interaction as a resource for novel imaginaries. Second, foretalk increases the social legitimacy of the forecasts in the sense that they are more likely to be believed. As Holmes (2013) shows, central bankers also develop strategies to increase their legitimacy by intensive communication with the public and the economy. Holmes' argument is parallel to the way in which forecasters increase the legitimacy of their forecasts by involving those who use forecasts in the process of producing them. Users become co-producers of forecasts and thereby have less reason to reject them. Third, foretalk improves the stability of the view of the future. Foretalk helps to bridge the gap between the knowable and unknowable elements of economic futures by providing (highly) unstandardized data, including judgments that econometric models could not process. This comprehensive interaction process may not make economic forecasts more accurate in a numerical sense. Nevertheless, it increases the range of knowledge about the intentions and assumptions of economic and political actors and therefore builds a more reliable basis for creating forecasts.

3.2. Patterns of External Interaction

The forecasters are embedded in a network that includes several groups of interaction partners, such as other economists from universities, entrepreneurs, policymakers, and members of the government and the state administrations. This interaction network is a constitutive part of the epistemic process of economic forecasting. The members of this network are transformed from ordinary interaction partners into co-producers of the economic forecasts. This network is called here an "epistemic network" because it is an active part of the forecasters' epistemic processes. The forecasters do not just interview, survey, or observe the others in the network; they want them to actively co-produce the forecasts. In this sense, forecasters give them the opportunity to participate in the epistemic process of forecasting – this is why I call it "epistemic participation" (Reichmann 2013).

This epistemic network includes a lively interaction between economic forecasters from different institutions. The forecasting institutes may follow conflicting scientific paradigms and they compete for funding; nevertheless, they frequently interact and cooperate, both formally and informally. On the more formal side, the institutes' members attend meetings and workshops to discuss economic topics; they talk in advance about their views on current economic development; they meet at conferences, political hearings, and public discussions. On the more informal side, the forecasters know each other from a variety of activities and relationships developed outside their formal work, whether from their time together as university students or from previous cooperations, co-authoring articles, or spending leisure time together. Within the forecaster community, all forecasters have individually formed networks of "foretalkers" (Gibson 2011b) and personal sources of information. Furthermore, economic forecasters are part of a network of scholars working at academic institutions: they hold lectures and seminars at universities, they work on common research projects, and they co-author papers and books with researchers from universities. These close ties to universities not only sustain the forecasters' identities as scientists (Evans 1997, 408) but also give them the chance to exchange ideas, share new insights and discuss problems, or, in Gibson's (2011b) words, to "foretalk" with academic economists. 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 allow judgment between models.

Exchanging ideas with colleagues is something familiar to most scientists. But the forecasters' epistemic networks include not just other economists who have more or less similar knowledge they can bring into the "foretalk." In particular, their external networks include policymakers and business representatives. The policymakers with whom they interact – for example, members of government units, federal banks, interest groups, lobby organizations, labor unions, and social partners, etc. – provide a different stock of knowledge and a fresh view on "the economy." This part of the external interaction network enables forecasters to interact with "the economy" to gather information about "the economy's" plans. In practice, forecasters are able to interact only with a limited number of representatives of "the economy." Still, for the forecasters, their interaction partners

are like intermediaries for “the economy.” When forecasters talk about their network, they rhetorically reify “the economy” and utter sentences such as: “It is really important to speak to the economy.” Of course, they are aware that they cannot really speak to “the economy” as such, but they interpret their intermediaries as windows on it.

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 economic developments meet to “foretalk” with those who create economic policy, shape the economic policy frame, and actually make economic decisions. And it is a place where two quite different groups of “mental time travelers” exchange their imagined futures.

The business representatives in their networks (such as CEOs, businessmen, and industrial lobbyists) consider forecasters to be scientific consultants conducting studies to answer their questions. But forecasters also give informal advice that helps the business representatives get an idea of what others think about recent economic developments and of the expectations in other economic sectors. Forecasters allow them to leave the “fog of uncertainty” (Interview 10, 00:36:45) and get a “bird’s eye view” (Gilbert and Jaszi 1944) on the economy. For that purpose, several economic forecasting institutes conduct regular panel studies. To obtain information about business representatives’ views of the economic future, they gather data from certain groups – for example, financial experts, CEOs, purchasing managers, port executives, and so on – at specific time intervals using standardized questionnaires. This process can also be conceptualized as one part of an ongoing (standardized) interaction between various groups of “mental time travelers.”

The integration of this external group works in many ways. During the forecasting process, the forecasting institutes first autonomously produce a forecast, which is called a “draft forecast” (field term). This first step is dominated by applying econometric models, which are analyzed by Evans (1997, 1999) in detail. After that, the continuous formal and informal discussions with the groups start. With an eye to recent problems on the political agenda, forecasters contact specialized policymakers to discuss the draft forecast, exchange views regarding ongoing economic developments, and explore the perceptions of the members of the policymaker network.

This process is generally not standardized, and it is permanently ongoing. As one member of a special interest group puts it:

“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 ones participating in this process: the collective bargaining partners and the most important ministries are involved. In most 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 those of the Treasury, Federal Reserve Bank, perhaps the 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 that the real value lies in the ongoing consultations. In the 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.” (Interview 17, 00:27:50)

Before the forecasts are presented to the public, several meetings take place. They are formal in comparison to the more informal talks previously described in this section. At these meetings, the final draft forecasts are discussed with a group of policymakers. Normally, those who participate in these meetings are also involved in the prior talks. A forecast takes about two to three weeks to prepare completely, but the interaction and the “foretalk” take place continuously. The “mental time travelers” keep in permanent contact and ensure that information on economic policy plans, on the political climate, and even on shifts in the economic paradigm are exchanged continuously.

We should not misinterpret this dense epistemic interaction network of forecasters and policymakers as purely a question of political power. Although the interests of particular groups and organizations may influence forecasts in the process of epistemic participation, there is no evidence that ideologically suitable forecasts can be simply ordered by policymakers. What is more important for the question of how forecasts for the uncertain (and non-ergodic) parts of the economy are made is that it is really

the economic forecasters who benefit most from being in a process of epistemic networking with policy makers. The impact of these contacts with political actors on the epistemic process of economic forecasting cannot be overstated: they bring to light new imaginaries about the future, they socially legitimate the forecasts, and they help to base the forecasts on better information and more diverse perspectives.

3.3. Patterns of Internal Interaction

Another part of the epistemic process is much more closed and takes place inside the forecasting institutes. This process of internal interaction enables different forecasters to harmonize and stabilize their “mental time travels” and involves another type of “foretalk.”

There are five discrete internal roles the forecasters have to play.³ Each role is responsible for a specific part of what they call “the economy.” One examines public finance and the government’s budget; another focuses on the labor market; a third looks at fiscal policy and inflation; and a fourth studies foreign trade. The fifth role is to integrate the data, the arguments, and the information collected by the other economists: the economist concerned is the one responsible for the national economy and is the “single person” 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).

At the outset, each of the five economists playing those roles individually produces a forecast on their respective topics using both quantitative models and additional information gathered during the external interaction described in the previous section (Patterns of External Interaction). Each of them produces calculations, creates interpretations, and thinks about the assumptions underlying these results. In this part of the forecasting process, each forecaster tries to “*get a sense* for what the present development may cause at the end of the year” (Interview 23, 00:18:25, my

3 The teams in the institutes vary and the description provided here is an “ideal type” generalization.

emphasis). This brings to light that “mental time traveling” is not just a cognitive but also an emotional activity.

After the phase of working alone on the first forecasts, a further interaction process starts. The five types of internal forecasters meet to discuss their individual results, exchange data, discuss their aggregate-related forecasts, and describe and justify their assumptions. They interact and “foretalk” with each other and try to align their forecasts and harmonize their “mental time travels.” Their aim is to create a forecast with no internal contradictions. One of the forecasters describes this step in detail:

“And if someone sees ‘Okay, this doesn’t fit here and there’, we just start again and take information from the others and go back to our offices and we begin to recalculate – we cut off the corners to make the calculations fit we call it *Rundrechnung*.” (Interview 25, 00:35:39; my emphasis)

The notion of *Rundrechnung* is an interesting one as it shows the iterative character of the interaction process. It is barely translatable, but a literal translation may be “round-calculation” or “circle-calculation.” It summarizes the process of several re-adjustments of the common forecast until it is a smooth, rounded, and theoretically consistent forecast. This notion describes accurately how economic forecasters adjust, re-adjust, and re-re-adjust their results until they have created a “rounded image” of the future. To them, this notion means that the components of the forecast fit together, that the forecast appears theoretically harmonious, and that there are no internal contradictions, no inconsistent corners, in the image it provides.

For about two to three weeks, the forecasters continue to work individually on their special topic. They then meet again with the others to produce a new forecast that is in line with the views of the other four types of internal forecasts. The process of *Rundrechnung* is based mainly on social interaction and can be understood as a repeated “foretalk” of “mental time travelers,” each with a different angle on the economy. Every economist is a specialist in one part of “the economy” and experiences it from a specific perspective. They come together to produce interactionally a common view that could not be produced individually. This clearly delineates that the forecasters are not passive observers of the economy but active participants in constituting the “knowledge” they create.

4. Emotion and Scientific Reasoning

After analyzing the huge interaction network economic forecasters are embedded in and analyzing how forecasters use this network to produce scientific knowledge, I now turn to a second epistemic resource forecasters use that is also beyond numbers and econometric models: Emotion.

Typically, science and emotion are juxtaposed. Traditionally, philosophies of science, such as positivism, argues that emotion has no place in scientific research; it *contaminates* the methodological process of pure science and distorts and disturbs the knowledge produced. Traditionally, science is characterized as a “cool, logical, dispassionate” (Parker and Hackett 2014, 549) activity. In contrast, newer methodological approaches argue that emotion in general helps to understand and interpret the world (e.g., Damasio 1994) – and this is also true for the economic world. These newer approaches criticize and challenge the “myth of dispassionate investigation” (Jaggar 1989, 161).

Within the sociology of science, emotion is an indispensable part of scientific research and scientific knowledge. There, the dichotomy between reason and emotion, a sacred cow in the classic philosophy of science, is strongly challenged. Yet, though the sociology of science and the sociology of emotion grew at the same time, there is no synthesized, homogeneous, and integrated theory of emotion in science. So far, any empirical work on the topic has analyzed the connections between emotion and scientific research in fine detail without joining the dots. In general, that research identifies two levels where emotion plays a role in science: First, there is emotion on the epistemic level, i.e., emotion is part of the process of producing scientific knowledge. And second, emotion plays a role on the institutional level, i.e., emotion forms and stabilizes institutions, e.g., through motivation, solidarity, etc.

Even in classic sociological writings, we find close relations between emotion and scientific reasons. The most prominent example was delivered in the 1930s by Ludwik Fleck (1979 [1935]), who created the famous idea of “thought styles”: cognitive frameworks that form the perception of the outer world. Thought styles are characterized by common research questions, by methodological standards, and by a common way to think and speak about both. Scientist with common thought styles build

“thought collectives” (“Denkkollektive”), and these groups are harmonized by common emotions. As Fleck argues, these emotions are not an opposite to rational reasoning but a necessary part of the epistemic framework in which every scientist works. Fleck argues that the “concept of emotionless thinking is meaningless. There is no emotionless state or pure rationality as such” (Fleck 1979 [1935], 49). For him, scientific research and scientific perception are deeply social and emotional activities, and emotion is an inevitable resource for analyzing the world.

Fleck’s insights were widely neglected until Thomas S. Kuhn re-discovered them in the 1970s. Henceforth, recent sociologies of science have frequently analyzed the role of emotion in science and (as Fleck did in the 1930s) destroyed the dichotomy between reason and emotion. Newer research analyzes, for example, how highly influential scientists describe the emotional aspects of their work and find that there are variations between disciplines (Koppman, Cain, and Leahey 2015) and investigate socio-emotional aspects of scientific collaboration such as trust (e.g., Knorr Cetina 1999; Shapin 1994), solidarity (Collins 1998), job satisfaction (Hermanowicz 2003, 2005), or emotions such as shame, despair, pride, and joy in peer review panels, job meetings, and priority disputes (e.g., Bloch 2012; Lamont 2009).

4.1. Emotions in Economic Forecasting

Drawing on this line in sociological research, I turn now to scientific economic forecasting again to analyze in empirical detail how forecasters mobilize emotions to produce economic forecasts. The interviews show that institutional and social aspects of emotion play only a minor role. Rather, they suggest that scientific economic forecasters emphasize and value emotion as an epistemic resource.

Let me start with an example from an interview with an experienced forecaster who worked for more than 40 years at the heart of German economic forecasting. I asked him if there were any special skills or abilities one needed to be able to forecast the economy.

“Well, you have to have one: you have to have a *feeling* for numbers, for the statistics, what can the statistics achieve, what can’t they achieve? What do we have to *add* to the numbers, so to speak. You also have to have a feeling for developments, let’s say, what was the economic development in the past, what

can we learn from it for the future? [...] A *feeling* for courses and developments.” (Interview 37, 00:10:10, my emphasis)

Later in the interview, the forecaster clarifies that, with the notion of “feeling,” he does not mean an “empathy for numbers,” such as human can have for other humans, but rather a feeling for what is possible to read from the statistics at hand and “how they are to be interpreted.” The necessity for a feeling for numbers is a dominant phenomenon in the interviews.⁴ Another interviewee, a young forecaster, describes it as follows:

“[...] even when we do not have to produce a forecast right now to go public, we must, of course, have an idea of what impulse something has now for economic growth, if the government has now decided this or that. Our colleague who focuses on financial policy deals a lot with the numbers we are provided with and asks: What was actually done? And makes a summary of the hard data and facts, which is, so to speak, the fiscal impulse, and then we start different quantitative programs and try to get a *sense of* (*‘Gespür’*), so to speak, what can this year still cause [...]” (Interview 23, 00:18:25, my emphasis)

These interviews show that, for forecasters, the line between emotion and numbers seems to blur. It is an epistemic two-way: It is not only necessary to get a feeling for the numbers, to know how far and in what directions they can be interpreted, and to identify possible errors. The numbers also support the forecasters in developing a feeling for the economy, for possible economic developments, and for what is going on, what the current main problems are in the economy. This is the main two-way epistemic resource of emotion in economic forecasting: Feelings for numbers and numbers as a support for feeling the economy.

How do forecasters develop such feelings for statistics and quantitative-informed feelings for economic developments? This question is especially important as forecasters learn their business mainly on-the-job and, normally, economic forecasting is not taught at universities (Reichmann 2010, 67–73). The interviews show that the ability to develop such emotion is based on experience:

4 Furthermore, there is other work that has found the same phenomenon, e.g., Kennedy and Hill (2018).

“You simply gather experience by joining in. [...] Then, of course, you also start reading the literature; you read the literature about models; you may develop a model yourself and then begin to forecast. *At the beginning, one believes very strongly in the results delivered by econometric models.* If one realizes after a quarter of a year that they were maybe not right, because something happened that was perhaps outside the model world, then you start to also bring in your experiences – and that is exactly this experience I’m talking about. That one knows how to estimate the results correctly against the background of many years of experience and many years of observing cycles.” (Interview 39, 00:03:50, my emphasis)

This (very experienced) forecaster creates an opposition between econometric models on the one side and experience on the other. Where the models fail, forecasters bring in other epistemic resources, such as emotion, interaction, or experience. This is exactly the point when forecasters bridge the gap produced by the radical uncertain conditions that frame their epistemic world. The need for experience has another consequence: Normally, young economists who are “rookies” (“Frischlinge,” Interview 37, 00:12:00) have to gain experience to develop the right emotions. This takes time, and it is difficult and complex for the more experienced ones to pass on such knowledge.

There is also a different side to mobilizing emotion as an epistemic resource: the control of emotion. One forecaster answers the question of the special skill or abilities differently – but he also refers to emotions:

“Yes, you have to, once, you have to stay *cool* and not let yourself be thrown off track by every little movement of any time series. So, for example, you’ve made a forecast and now, the stocks have fallen. Now you have to be very *calm*, let’s wait and see [...] So you have to keep calm, stay *firm*.” (Interview 36, 00:15:00, my emphasis)

In this case, the forecaster argues that, to make good forecasts, emotions have to be controlled. Forecasters are often confronted with high dynamics, e.g., in financial markets or politics. Such dynamics should not upset forecasters as they have to keep an overview. The control of emotion and “keeping calm” is a further epistemic resource for economic forecasters.

The last case I want to present here is an economist who was deeply involved in producing the System of National Accounts (SNA) in Germany her whole academic life. She told me in great detail about her contributions to the SNA in Germany, about the technical developments, and about

conflicts she had with others. After this relatively long part of the interview, she summarizes:

“Let me say, it was actually a fulfilling program, I had there.” I: “Yes, fulfilling in the sense of time consuming ...?” “Yes, but also, I had fun. [laughs] It was really, well, with this ‘account of the flow of income’ (‘Einkommenskreislaufrechnung’) you can [...] calculate balances that are not available elsewhere. And I was so crazy that I always found the new results exciting. [laughs] I was really, I really had, I really had fun, and I have to add that, I think that’s the way it must be; otherwise you can’t do that.” (Interview 35, 00:31:45)

The same forecaster said a little later in the interview:

“[...] for me it was like a crossword puzzle. Every time I was curious about the balances, for example. changes in inventories, or profits. Well, let’s say it this way: it was really, like I invested some of my blood, sweat, and tears (‘Herzblut’) in the whole thing.” (Interview 35, 00:32:30)

This interview shows another dimension of the role of emotion in economic forecasting. The work on the data and the development of a “feeling for numbers” mentioned above is “fun,” and it needs more than a superficial glance at the data. In the above case, the forecaster even highly identifies with the statistics she produced. And she had great “fun” when working on them.

4.2. Emotion as Epistemic Resource

To sum up, the empirical data from the interviews show that emotion is mobilized in economic forecasting to produce knowledge about the economic future and ensure the quality of economic forecasts. Producing scientific knowledge under radical uncertainty requires investing in emotion that helps to bridge the gap left by the shortcomings of pure reasoning, of economics theory, and of econometric models. Economic forecasts would be worse⁵ without the feeling for numbers, without the quantitative-informed feeling for the economy, without a coolness towards the manifold dynamics of economy and politics, and without a kind of fun and “joy” (“Freude”) when working with statistics and numbers.

5 For, what it may mean to evaluate a forecast to be “good” or “bad,” see Reichmann (2018, 251–87).

The interviews furthermore show that the traditional juxtaposition between emotion and reason is untenable. Economic forecasters argue that the future is open and that pure reasoning, statistics, and econometric models cannot fill the uncertain world they work in. Forecasters have to “add” something, and that is feelings, coolness, and passion. In doing so, they make it possible to produce legitimate scientific knowledge under radically uncertain conditions and ensure the quality of their forecasts.

5. Conclusion

Producing scientific economic forecasts involves not just econometric modeling, economic theories, and huge amounts of statistics – it is also full of social interaction and emotion. Forecasts are neither the result of simply feeding econometric models nor the result of pure reasoning in social isolation. Rather, economic forecasting is also based on various forms of social interaction and on mobilizing emotion. The interactional processes enrich and sharpen the expectations and imaginations of the economic future by increasing the forecasts’ responsiveness to novelty, their social legitimacy, and their stability. Emotion helps to overcome the shortcomings of data, statistics, and econometric models.

Social interaction is, first of all, a resource for economic forecasters to discover novel imaginaries of the future they would otherwise have missed. It also increases the social legitimacy of their forecasts because they integrate many political and economic actors into their epistemic process. Forecasters are confronted with the problem that the open character of the economic future increases the need to legitimate the knowledge they produce about the economic future. By including as many relevant actors as possible, the interaction process helps to justify forecasts and the political decisions deduced from this knowledge, even if they turn out to be “wrong” afterwards, and therefore improves the stability of the common view to the future. The interaction network provides access to the beliefs of many economic and political actors and enables the forecasters to pick up emerging trends entertained by actors who have a significant chance of performing the future. Economic forecasters mobilize emotion because they are aware of the risks and shortcomings of statistics and econometric models. They argue that they have to “add” something to the models,

something that the models alone cannot fulfill. Based on experiences from past forecasting processes, they develop a feeling for numbers, one that helps them to analyze, process, and interpret what econometrics cannot depict. Both interaction and emotion are inevitable epistemic resources in forecasting the non-ergodic part of the economy.

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