

Valuation on financial markets: Calculations of emotions and emotional calculations

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Abstract

How do actors on financial markets transform the plethora of informational signals into concrete valuations of traded assets? How do they make decisions in an environment characterized by fundamental uncertainty? Although there is a rich tradition in economic sociology suggesting that emotions and other subjective factors play a decisive role in this regard, empirical studies of their relevance for economic action have remained rare. The present study seeks to fill this void. We investigate the emotional underpinnings of the practices of financial valuation in the German financial sector. Drawing on in-depth interviews with, and ethnographic observations of day traders and fund managers, we show that emotions are essential ingredients of their collective calculative practices. Results of the present study yield three empirically grounded key concepts that advance our understanding of emotions in financial valuation: First, subjectively experienced market feelings enable traders and managers to imagine imminent market futures. Second, market sentiments reflect traders' attributions of specific emotional qualities to financial markets and facilitate their understanding of market behaviour. Third, floor emotions are collective emotions in which traders become involved in organizations and on trading floors that help mitigate situational uncertainty.

Key words: economic embeddedness, emotion, evaluation, financial markets, uncertainty, valuation

Introduction

The financial sector is a paradigmatic sphere for economic valuation. A diversity of human and nonhuman, individual and collective actors produce ongoing streams of code, figures, and text related to financial valuation. The typical ‘calculative spaces’ (Callon and Muniesa, 2005) in which these practices become manifest are research organizations, banks, trading floors, think tanks, data warehouses, or news organizations. Paradoxically, these actors cope with an unpredictable future precisely by creating a ‘bewildering diversity’ of estimates and calculations (Orléan, 2014: 195). This begs the question of how human actors in financial markets, such as traders and fund managers, transform this multiplicity of information into concrete valuations of priced and traded assets. How do they deal with and evaluate this overabundance of information? And how do they make decisions in an environment that is characterized by fundamental uncertainty (Beckert, 2016: 21–94)?

Economic sociologists have long argued that financial valuations are not simply technical, arithmetic calculations, but instead dynamic and reflexive social constructions. Over the past decades, they have developed a number of accounts that provide valuable insights into these questions and into the social fabrics of financial valuation more generally. Contrary to widespread portrayals of valuation on financial markets as an exemplar of instrumental-rational calculus, the existing research suggests that even quantitative or algorithmic valuations are contingent on social embeddedness (Baker, 1984; Granovetter, 1985) and rely on specific socio-technical environments (Beunza and Stark, 2004; Zaloom, 2006).

What also becomes apparent in these and other analyses is the experiential and emotional dimension of financial valuation. Complementing and further developing these existing understandings, the present study argues that translations of the plethora of informational signals, estimates, and calculations into concrete valuations of traded assets on

financial markets are essentially facilitated by both, the subjective-experiential and the social-relational dimensions of emotions. Regarding the subjective level, we capitalize on emotions and their close entanglement with cognition, as illustrated by extant psychological (e.g., Lerner et al., 2015) and sociological (e.g., Pixley, 2002) research. Regarding the social dimension, we subscribe to perspectives in economic sociology (Bandelj, 2009) and the sociology of emotion (e.g., Burkitt, 2014) that emphasize the emotional embeddedness of economic action as well as the relational dimension of emotion.

Based on this rich theoretical tradition, we aim at elaborating the emotional underpinnings of financial valuation through an empirically grounded, data-driven inductive approach based on in-depth interviews with day traders and fund managers and an ethnography of a trading floor of a German bank. Results of the study yield three empirically saturated concepts concurrently reflecting the subjective and social dimensions of emotion in financial valuation: Subjectively experienced *market feelings* serve actors to imagine an imminent market future; attributions of *sentiments* to markets reflect actors' ascriptions of emotional qualities to entire financial markets; and *floor emotions* as socially situated collective emotions are a frequent point of reference when actors encounter market uncertainty. In light of these findings, we distinguish two key principles of how emotions relate to financial valuation, individually and collectively: *calculations of emotion* and *emotional calculations*. The former principle refers to mostly deliberative calculations that serve to assess the emotional states of markets and their participants; the latter refers to the affective (phenomenal, experiential) modes of practices of financial valuation.

In the following section, we first review theories of financial valuation and then discuss sociological research on valuation in finance, especially with respect to the role of emotions. Based on this review we develop a multilevel sensitizing concept of emotion in finance. The third section then illustrates the methods and research design we employed and

the fourth section presents the results of our analyses. We conclude with a summary and an outlook on future research.

Emotions in Calculative Practices and Trading

Financial valuations take place when entities in the world are evaluated, calculated and estimated or, more generally, when differences and relations are established between them. Following Lamont (2012: 205), ‘evaluation’ can be understood as ‘the process of assessing worth’, which can be distinguished from ‘valuation’ as ‘the process of giving worth’. Looking at trading on financial markets, ‘evaluation’ generally refers to the observation and interpretation of specific states of the world, such as the state of a particular market or an event. Financial evaluations and valuations are thus not just arithmetic and algorithmic operations, but can rather be conceived of as ‘calculative collective devices’ (Callon and Muniesa, (2005). We first review four prominent strands of research on valuation in economic sociology and how they relate to emotions: studies on decision making under uncertainty, social embeddedness, socio-technical arrangements, and performativity. In a second step, we develop a multi-level perspective on emotions in trading that serves as a sensitizing concept for our empirical analysis.

Decisions under uncertainty

A relatively recent understanding of emotions in economic sociology entails that emotions are essential to economic behaviour, including calculations and decision-making in trading, because they are closely associated with reason, rationality, and underlying cognitive processes (Barbalet, 1998; Pixley et al., 2014). Regarding finance organizations, Pixely (2002) has examined how ‘financial expectations are generated through socially based emotions within and between organizations’ (p. 42). She capitalizes on organizations rather than on individuals and argues that they are both, rational and emotional at the same time. Impersonal trust and confidence as well as their emotional counterparts are essential to

dealing with uncertainty because they are future directed emotions critical to the formation of expectations. Especially trading floors, then, can be understood as calculative spaces (Callon and Muniesa, 2005) characterized by expressions of emotions that also serve as cues to evaluate a certain market situation (Hassoun, 2005).

At a more individual level, but still accounting for group dynamics, scholars have also focused on the role of discrete emotions (Lerner et al., 2015), for example with respect to fear and greed engirding uncertainty in financial decision making (Lo, 2013), or anxiety as a consequence of denial and of realizing that rational optimization is not a viable option (Taffler et al., 2017). Furthermore, Tuckett (2011) in a study on asset managers finds that ‘emotion exists to help economic human actors when reason alone is insufficient’ (p. 13) and that financial markets run on simple decision heuristics, emotions, and gut feelings rather than on successions of purely deliberative rational choices. This view is mirrored in studies on storytelling and sensemaking (Eshraghi and Taffler, 2015) and on ‘conviction narratives’ that are constructed to manage cognitive and emotional conflicts arising from investment opportunities (Chong and Tuckett, 2015).

As such, this line of research first and foremost capitalizes on individual aspects of emotion in economic behaviour, paying comparably less attention to the relational and structural factors emphasized by research in the social embeddedness tradition.

Social and emotional embeddedness

Research on social embeddedness has shown that valuation is contingent on social structure, specifically on social networks. Baker (1984), for example, has shown that the valuation of financial assets depends on the size of traders’ networks and that price formation is sensitive to their physical co-presence in the pit, much of which can be described in terms of nonverbal emotional behaviour. Likewise, Abolafia’s studies on markets as ‘structured anarchy’ (1996) have shown how individual market opportunities are balanced by

collectivized formal and informal restraints. Trading styles and cultures lead to socially shared knowledge that works as a ‘tool kit’ in guiding valuation. Here, emotions are important ingredients of valuation, for example in terms of a ‘feel for the market’ as a visceral signal or regarding the regulation of emotions to improve role performance (ibid. 236–242).

The link between embeddedness and emotions has most explicitly been taken up by Bandelj and her concept of *emotional embeddedness* (2009). In her view, the impact of emotions in economic affairs is not limited to transforming individual utility functions or to informing the role-making of economic actors. Emotions likewise occur in and are the result of social interactions and thus enable and constrain economic activities and outcomes in a very general sense (p. 355).

Socio-technical arrangements

Closely related to the idea of emotional embeddedness, recent research has increasingly accounted for the impact of digitalization on financial valuation, thereby highlighting how socio-technical arrangements cause shifts in how emotions affect financial valuation. Human actors interact, and hence calculate, jointly with nonhuman actors like screens, algorithms, or digitalized markets. Emotions have variously been identified as elements of these socio-technical arrangements. The ‘morning test’ (Zaloom, 2003: 268) is a straightforward example: traders place a small sell position to observe whether a given bid-ask relation changes or is ‘absorbed’ by the market. If absorbed, traders tend to attribute a ‘strong conviction’ (i.e., ‘bullish’) to the market. Similarly, Beunza and Stark (2004: 395) report traders ‘calibrating’ algorithmic bots with respect to emotions they perceive on the trading floor. Knorr-Cetina and Bruegger have highlighted the importance of feelings, emotions and emotion regulation in establishing value on foreign exchange markets (Knorr Cetina and Brügger, 2002b: 400). They also emphasise collective forms of feeling, such as

‘synchronized collective emotional arousal’, that inform valuation (Knorr Cetina and Brügger, 2002a: 930).

Performativity

A fourth field addresses the ‘performative’ impact of economic theory (Callon, 1998), for instance regarding the Black-Scholes-Merton model and its practical and social implementations (MacKenzie and Millo, 2003). Although these perspectives focus on quantitative-arithmetic calculations, qualitative-emotional facets of financial valuation become apparent, too. Svetlova (2013), for example, has investigated situational ‘de-idealizations’ of the Discounted Cash Flow model, showing that market actors develop stories related to an investment idea that is infused with feelings targeted at a given investment opportunity. Storytelling then leads to manipulations of the model’s assumptions and parameters so that they fit these underlying narratives. Research has also investigated valuation in automated and high frequency trading (see Lange et al., 2016), where bots or algorithms carry out decisions independently from human oversight. Here, one motivation for automation is the exclusion of bias stemming from human emotion. Borch and Lange (2016) show how high frequency traders deploy self-disciplining techniques to reduce the influence of emotions, although they at the same time develop emotional attachments to their models and algorithms.

A multi-level perspective on emotion

These accounts suggest that emotions need to be investigated from multiple angles to uncover their full explanatory potential. Our aim therefore is to complement and extend the perspectives on valuation and emotion discussed above and to further develop their accounts of the role of emotion in trading. We do so by linking these existing approaches to insights from the sociology of emotion, which basically considers emotions as socially configured while at the same time configuring the social (e.g., von Scheve, 2013).

One account has emphasized the individual-level consequences of feelings and emotions for cognitions, calculations, and decision-making. These are essential ingredients of economic action and insights into the ways in which emotions interact with these capabilities can advance our understanding of the trading process. Even though approaches informed by behavioural economics can be rightly criticized as ‘reductionist’ (Tuckett, 2011: 13), they do gain sociological momentum when accounting for the fact that the emotions which are supposed to affect decision making are – inevitably so – socially and culturally patterned and do not arise arbitrarily across individuals. In line with research in the sociology of emotion, we therefore need to recognize that emotions are generated in specific social and cultural contexts and thus are essentially affected by and at the same time shape social structures and relations (Turner and Stets, 2006). Cultural theories of emotion, in particular, may shed light on how economic theory as a form of cultural knowledge affects emotions in practices of valuation (e.g., Denzin, 1990). Likewise, the concept of emotional embeddedness resonates well with recent relational approaches to emotion (Burkitt, 2014) which emphasize that emotions are generated in social interactions and constellations and are a key ingredient of social encounters and relationships. The relational perspective in the sociology of emotion highlights that emotions are dynamic relational processes not confined to individuals, but rather are properties of the entanglements of human and non-human actors alike (von Scheve, 2018). A similar perspective is found in research acknowledging that emotions can be collective, i.e. shared within groups, organizations, and gatherings or even markets and sectors. Here, the sociology of emotions has developed a range of theoretical approaches, from Durkheim’s (1912) ‘collective effervescence’ to Collins’s (2004) ‘interaction ritual chains’ that may serve as guiding principles for a comprehensive analysis of emotions in practices of valuation.

The existing research in economic sociology in combination with accounts from the sociology of emotion thus suggest to investigate emotions, simultaneously, at multiple levels of analysis. Although providing invaluable insights into the role of emotions in economic behaviour, most of the existing research has capitalized on separate levels. In what follows, we therefore use this multi-level perspective on emotion as a sensitizing concept for the empirical analysis to arrive at a comprehensive understanding of the role of emotion in the calculative practices of trading on financial markets.

Methods and Data

Using Grounded Theory Methodology to guide data acquisition and analysis (Corbin and Strauss, 2008), our aim is to identify analytical relations between emotions and valuations as they become manifest in (a) actors' internalized meanings, (b) their everyday occupational routines, and (c) in social interactions with human and non-human others. We follow Grounded Theory to theoretically inform and saturate empirically developed concepts through these different analytical angles and the 'constant comparison' (ibid. pp. 73–78) between them.

Based on the existing literature, we conceive of emotions as fundamentally socially constructed, inextricably linked to cognition and social action, and as a social relational and collective phenomenon through which actors are embedded in social constellations. To empirically grasp these dimensions, we conducted in-depth narrative interviews with day traders and fund managers and carried out ethnographic observations of a trading floor in the German financial sector. The interviews provided us with first-hand, subjective accounts of emotions and their role in trading. They offer valuable insights into those facets of emotion that can be articulated and observed by our interviewees, for example the subjective meanings they attach to specific emotions, the narratives they construct of social situations, and how they express and observe emotions and emotional behaviours on the trading floor. These

accounts are invaluable sources for understanding how traders and fund managers make sense of their own and others' emotions on a day-to-day basis. Ethnographic observations complement this data with third-person accounts of how emotions are expressed, communicated, and used in trading.

Two choices we made in acquiring our data are noteworthy: First, unlike other national financial systems, the German banking sector is characterized by private, cooperative, and public savings banks that usually offer both, retail and investment banking services. Importantly, the socio-technical environments within which our interviewees and observed traders and fund managers operate are, for the most part, comparable to the leading financial centres, for instance in London and New York. Second, economic sociologists investigating the financial sector have usually focused on specific trading areas, for example currency trading (Knorr Cetina and Brügger, 2002a) or quantitative merger arbitrage (Beunza and Stark, 2004). In contrast, our sampling strategy explicitly aimed at covering a broad range of different trading areas and markets to exploit the possibilities of contrasts and comparisons between these areas. Specifically, our sampling strategy sought to cover three categories structuring trading on financial markets: (a) day trading and fund management, especially to capture short- and medium-termed investment behaviours; (b) different asset classes to capture specific trading practices (e.g., bonds, stocks, or derivatives); and (c) different levels of trading automation, especially to capture varying connotations of emotions and arithmetic calculations along these levels.

Interviews and ethnographic observations were carried out in two stages: The first stage was carried out in two months in spring 2012. We conducted 20 in-depth interviews in German, lasting between 57 and 110 minutes. Following our multi-level perspective on emotions, the primary interest at this stage was to acquire subjective accounts of the role of emotion in everyday trading as well as in exceptional circumstances, for example the

subprime crisis. Breaks between interview sessions were used for initial analyses and for data-driven modifications of our interview guideline. Eight interviews were conducted in day trading branches of public savings banks and one investment bank. Interviewees were specialized in fixed income trading, currencies, merger arbitrage, interest rate derivative trading, and algorithmic treasury trading. Eleven interviews were conducted in fund and asset management divisions of corporate banks, public savings banks, independent asset management firms, and one insurance firm. Interviewees here specialized in fixed income and stock funds, exchange traded funds, and in funds of funds management. All interviewees were male and interviews were digitally recorded and transcribed for subsequent analysis.¹ Interviewees differed regarding their level of work experience, with half of the sample being socialized in analogue open outcry trading, and the second half in digital trading. The initial parts of each interview aimed at generating open-ended narratives on interviewees' work-related socialization and the processes, actors, and social environments they deem relevant for trading. In the following parts, these narratives were used to focus on calculations and emotions in light of interviewees' social embeddedness, inquiring, for example, how calculations are carried out, what information is processed, what technical tools are used, which emotions are experienced while trading, how emotions are observed and communicated on trading floors, and to whom they are attributed.

The second stage of fieldwork capitalized on ethnographic observation (Hammersley and Atkinson, 2007) and was carried out in spring 2013 on the trading floor of a German bank housing bonds, stocks, and derivatives divisions and a sales division. This stage concentrated on the interactional and collective dimensions of emotions and financial valuations. On ten succeeding trading days, with the first author performing the role of a guest and 'acceptable

¹ During the ethnography of the trading floor, some informal interviews were also conducted with female day traders. However, in this study, we cannot account for possible gender differences and can only capture the, unfortunately, still dominant group of male traders and fund managers.

incompetent' (ibid. 79), teams of traders in the fixed-income bonds division, the money-markets division, and the derivatives division were observed for a few days. Data acquired consisted of field notes, informal interviews with traders and team managers, and a number of digital audio recordings of trading situations.

Data analysis complied with Corbin's and Strauss's (2008) recommendations in that different types of data were integrated using a conditional/consequential matrix (ibid. pp. 90–95) and open, axial, and selective coding techniques (ibid. pp. 195–204). On the one hand, concepts and categories were developed to capture distinctive elements of emotions and arithmetic calculations and their relations and entanglements on the other hand. Crucial cases and key narratives were analysed using in depth-hermeneutical methods (Moules, 2015). The analysis was conducted using MAXQDA software.

Results

Our data include a range of narratives and observations on how emotions matter when traders and fund managers engage in financial valuations. We find indications as to how emotions are embedded in and arise from different social contexts, from industries and markets to firms, organizations, and personal networks. This embeddedness also means that traders are routinely confronted with market-specific discourses and narratives related to different emotional phenomena. This includes short-lived specific emotions, such as anger, fear, or anxiety, as well as more sustained moods, for instance tension, elation, nervousness, or euphoria. On the one hand, interviewees are suspicious of emotions as irrational and disturbing forces subverting the ideal of rational and optimal decisions. On the other hand, respondents reflect upon and accept that to practically engage with an uncertain future cannot be accomplished on purely rational grounds. Respondents know about their cognitive limitations – and hardly anyone entirely disregarded the decisive impact of emotions on

financial valuation. Moreover, we identified narratives pertaining to both individual emotions and collective emotions in ritualized interactions.

To interpret this diversity of observations, we refer to the theoretical concepts outlined in the previous sections: First, we distinguish between evaluations as observations and interpretations of current states of the world and their impact on financial markets, and valuations as pricings of specific financial assets. Second, we focus on both, the individual and social dimensions of emotions in evaluations and valuations. We then elaborate three concepts, each of which implies different emotional qualities of valuation: (a) subjectively experienced *market feelings* that serve actors to imagine an imminent market future; (b) attributions of *sentiments* to markets that reflect actors' ascriptions of emotional qualities to entire financial markets; and (c) *floor emotions* as socially situated collective emotions which are a frequent point of reference when actors encounter market uncertainty.

Market feelings

The concept of subjectively experienced market feelings points at an emotional 'tool kit' that serves to evaluate states of the world (and of markets, in particular) and to imagine short-term market futures. Our data show that market feelings are essential to valuations in different trading roles and styles: They are emphasized by both day traders and fund managers, indicating their relevance for short- as well as for longer-term trading regimes. Furthermore, not only 'pragmatic' market actors, who tend to disregard econometric models and algorithms, refer to market feelings, but also actors who strongly rely on these models. Although the latter in principle aim at suppressing any sort of emotional influence on trading, market feelings are still relevant to this category of market actors.

Our respondents generally emphasize the need to acquire a 'feeling for the market' in the sense of an educational effort of occupational socialisation (as illustrated by the concept of

Gefühlsbildung, Röttger-Rössler, 2019).² Traders thus learn to develop these personal feelings and to continuously review, validate, and update them while engaging with the market. Market feelings serve as important components of calculations when evaluating other market participants, events, or objects that are relevant for trading. They are reflected in sayings such as ‘establishing a feeling for the bank’ with which one wants to make a deal, ‘sensing how people tick’, picking up on a ‘felt momentum’, or identifying the ‘weak hands’ by investors who recently entered the market and face losses, or in ‘good or bad omens’, for example when a declining market feels like a ‘slowly falling knife.’

Market feelings are seen as an evaluative indicator of a particular market situation that unmistakably refers to the current conditions of emotional embeddedness, as the following quote of a fund manager illustrates:

As I said, everything becomes a question of sentiment; you get the feeling ‘Okay, there appear to be more buyers than sellers in the market or more sellers than buyers.’ So you tend to make highly short-term analyses of the sentiment, which really cannot be acquired by written pieces of research... This totally short-term sentiment... is also really a kind of feeling.

In financial trading jargon, the term ‘sentiment’ usually refers to quantitative sentiment modelling and analysis (see below). In contrast to this sort of sentiment analysis which is usually carried out by corporations and agencies with a time lag of several days, the above-quoted fund manager expresses the need to instantaneously grasp a market in emotional terms, what he calls ‘a kind of feeling’. Even if such ‘felt’ evaluations of a current market must remain ‘quick and dirty’, they can inform an imminent valuation of the price of a financial asset, which is illustrated by the following quote:

² All quotes stemming from the data own translations of the German narratives and field notes.

And that's everything, and it always happens in the market sounding, you know?

Those are the people who advise the issuers...and who have to have a feeling for how much a coupon needs to be written up for Italy so that it can then collect three billion in ten years, okay? That's market sounding. Actually, it happens with every new issue of whatever kind of bond.

With the term 'market sounding', a sales trading team manager refers to the ongoing interactions with others to comprehend the current (and future) state of a market. He underscores the capability to transform such a 'market sounding' into a subjective market feeling as an important competence of staff. The above quote is particularly telling because of its specific reference to the trading situation of newly issued government bonds: The trader's subjective feeling is tied precisely to an unresolved problem concerning a trade or an expectation. If Italy seeks to collect three billion by issuing a government bond, market feeling is used to determine the amount of the risk premium ('coupon'). Thus, a qualitative feeling here enables the generation of a quantitative valuation.

Furthermore, this emotional evaluation serves as a precondition to estimate short-term market and price developments.

For a trader, what matters most is to always be in the flow. I'll just put it like that.

To be in the flow means that you always have to have a feeling for what the market will do next. You know? And the best way to get this feeling is to do a lot of trading.

The future-orientation of market feelings seems to be more reliable when rooted in ongoing market activities and high trading rates. To put it like a bond trader observed as part of the ethnography: 'Only if an active risk is taken, you will have a completely different market feeling.' This kind of feeling thus is not a stable mental structure resulting from

routine activities, but instead a dynamic process that includes one's own experiences, recently made decisions, and the current state of one's embeddedness.

In this sense, our data do not perfectly align with Abolafia's concept of a 'feel for the market' as a predominantly 'visceral' trading signal (1996: 236–237). Although visceral states, for instance strong affects or gut feelings, do play a role in our respondents' narratives, the data show that much more deliberation takes place when (emotional) evaluations of other objects or actors are associated with one's own emotional state. Feelings represent an 'intertwining of bodily affection, world-directedness and self-involvement' (Thonhauser, 2019: 57), which in the case of market relate subjective evaluations to (occasionally) anonymous and diffuse financial markets in an emotional manner. We term this market-related element of subjective feelings 'emotional calculations' and suggest that it aptly reflects what Beckert (2016: 32) theorizes as the 'cognitive and emotional force' of 'imagined futures.'

Sentiment attribution

Social embeddedness in the financial sector means being involved in networks of social relationships, information, and practices. Here, again, traders as well as fund managers directly draw upon these relations in their financial valuations or account for them through media and discourse. They regularly observe and interact with other market participants (colleagues, peers, competitors, etc.) and relevant actors (customers, stakeholders, policy makers) outside their firms, accounting for the results of their evaluations and valuations in their very own practices. Encountering emotions in trading therefore often means to treat them as a form of (rationalized) *knowledge about* other actors and entities, in particular financial markets. Especially pragmatic traders, who do not extensively rely on econometric models and algorithms, routinely attribute emotions to 'the market' as an autonomous

nonhuman agent and seek to incorporate this knowledge into their own evaluations of a given situation when valuing financial assets.

These attributions of ‘market sentiment’ are rooted in hunches regarding the goals, expectations, or feelings of a given financial market and its participants. These hunches often go hand-in-hand with the use of emotion-laden language by our respondents ascribing a specific, carefully labelled and categorized ‘sentiment’ to an entire market. For example, respondents use terms like ‘bullish’ or ‘bearish’, ‘rational’ or ‘irrational’, ‘ill’, ‘nervous’, ‘panicking’, ‘strange’, ‘shaky’, or ‘euphoric’ to describe markets. These hunches are also based on information requested from colleagues, customers, or market monitoring software to assess a current market ‘sounding’ or ‘psychology’.

Sentiment attributions thus explicitly account for and reflect traders’ and managers’ emotional embeddedness. Pragmatic traders, in particular, describe market sentiments as a ‘seismograph’, something that should be ‘on the radar’, and as a powerful ingredient to one’s decision making. While observing a money markets desk (short-termed bonds), a trader described the evidential qualities of market sentiments as follows: To her, ‘asking’ for or ‘hearing’ market sentiment is essential to determine either ‘market euphoria’ or the ‘doom and gloom’ of a market, thus significantly affecting trading decisions. From our data, we identified three sources of sentiment attribution to be most evident: observing prices in real-time, formal sentiment analyses, and communications with other market participants.

Initially, the assessment of market sentiment is closely linked to our respondents’ ongoing market observations. Here, real-time visualizations of price fluctuations and general trading activities provide information regarding one’s own position in the market and likewise suggest specific market sentiments. For example, the SPX volatility index (VIX) of the Chicago Board Options Exchange is a decisive indicator for visual market observations. Its widespread characterization as the ‘fear index’ immediately conveys its emotional

significance. One bond trader states that these indices represent the ‘outside sentiment’ that can be visually perceived looking at the German government (futures) bond spot rates. During participant observation, a swaps- and options-trader during a phone call, when markets were rapidly declining, said pointing at the bond chart: ‘If you have a look at the Schatz. That is the pain.’³ Through the chart, a certain level of pain seems to become visible, as do the ‘pain sellers’, i.e., market participants who massively sell assets on initial signs of a downturn. Assessments of market sentiment, in general, seem to rely on a hierarchy of indices in different trading areas, on the volume and volatility an index represents, and on their specific peaks. These numerical figures are then labelled to characterise a market, using different sentiment terms (see above).

A second source of sentiment attribution are mathematical indicators and models known as ‘sentiment analysis’ (see Peterson, 2016). These calculations primarily serve to quantify market sentiment, ideally as signals computed in real-time and based on extant market data. For example, our respondents rely on put-call ratios as the ratios of buying and selling futures contracts to quantify market sentiment. If sellers dominate the market, the overall sentiment is deemed unfavourable or negative. Although our respondents generally use such indicators, especially to evaluate a current situation, some of them voice reservations: For the pragmatic trader quoted above, sentiment analysis is not precise enough because of the delayed accessibility of the respective indicators, so that the current market situation is never adequately reflected in these figures. This argument also pertains to sentiment indicators relying on surveys amongst market participants, entrepreneurs, and consumers, or on sentiment mining in social media, because of their time-consuming efforts through extensive data analysis. Likewise, a model-oriented fund manager reports that he

³ ‘Schatz’ is the colloquially abbreviation of ‘Bundesschatzbrief’, a short-term German government bond and important index for money markets trading.

does not use sentiment indicators. For him, to personally decide for or against a specific sentiment indicator (as part of his trading model) already constitutes a discrete (and even emotionally motivated) decision he would ideally seek to avoid. However, besides these critical perspectives on sentiment analysis, there is a well-established field of professional suppliers for sentiment models that often directly refer to the negative facets of emotion in finance, for example using slogans like ‘Make Emotion Work For You, Not Against You’.⁴

A third source of information for the attribution of market sentiment is communications amongst traders. The following fictional account, given by a bond trader, explicates such a direct way for ‘asking for’ or ‘hearing’ market sentiment:

‘Hey, what’s your mood like? By the way, the bond is coming out...I know you’re interested in the bond. But could you again give me your absolute bottom price?’ ...Then he simply increases the price two or three cents, or not. But at least then you’ve gotten a sense of the sentiment.

Even if, in this example, the transaction does not ultimately take place, the trader can nonetheless determine market sentiment, simply by asking for it as part of a typical sales conversation. The trading partner is seen as an emotional representative of a financial market and to ask for his personal ‘mood’ gives a hint to the current sentiment of this market. Furthermore, we find cases in which requesting information on the current market sentiment is the main intention to contact other traders. During participant observation, a manager, who had been on leave for some time, placed many of these calls not just to gather ‘hard’ information, but also to get an impression of the overall market sentiment. Relevant informants often are trustworthy colleagues, but it seems that communications-based

⁴ See *sentimentrader.com* by Sundial Capital Research Inc [28-01-2020].

sentiment assessment is intended to encompass a broader range of significant others, including those who hold ‘contrarian views’ or with whom one is connected via weak ties only.

Acquiring knowledge about market sentiment also often proceeds implicitly. In the following quote, a bond trader remarks that he intends to make a deal based on ‘indications’ (i.e., offer recommendations) and thus reaches out to another party, only to learn that his trading partner unexpectedly revokes the initial price:

And when you follow the indications, saying, ‘Okay, I’d like to get in on that’ and you notice that he withholds it or holds it back, you know? That is, he withdraws his price. Then you can see more or less what the sentiment of the market is.

To the interviewee, revoking a price reflects a kind of ‘emotional reasoning’ that is valuable to assess a given situation. He may attribute nervousness to his trading partner withholding. Thus, neither ratings nor return rates are the primary sources of price valuation here, but rather the current psychology and sentiment attributed to the market.

Linking these observations back to our theoretical considerations, attributions of market sentiment can be conceived of as a discursive and aggregated approximation of the behaviours of other market participants. Interestingly, establishing market sentiment from performance indicators, sentiment analyses, and direct market interactions proceeds largely in a deliberative fashion and does not necessarily involve personal emotional experiences. It produces, however, an emotional register to assess a current market state. Thus, ‘anthropomorphizing’ and ‘emotionalizing’ financial markets (Forstmann and Burgmer, 2018) significantly aids market actors in evaluating these diffuse aggregates of other market participants. We therefore suggest that market sentiments embody ‘calculations of emotion’

and reflect traders' categories of perceptions and evaluations of a market's 'circulating voices' (Esposito, 2011: 66).

Floor emotions

Traders and fund managers are not only embedded into sectors, markets, and corresponding networks, but likewise in the institutional and organizational arrangements of the firms in which they work, including networks of in-house colleagues and superiors, departments, office spaces, and trading floors. Aside from organizational hierarchy, socio-technical arrangements on trading floors are key arenas of contemporary financial assets trading (Beunza and Stark, 2004; Zaloom, 2006). Investment banks value trading floors to facilitate direct exchange between traders under conditions of bodily co-presence. In our data, especially actors who are embedded on trading floors (mainly in day trading) unambiguously articulate the relevance of an emotional embeddedness. Using the term 'floor emotions', we show that the ritualized face-to-face interactions on trading floors are significant arenas of verbal and nonverbal emotional communication, the emergence of collective emotional states, and the social sharing of traders' emotions (Rimé, 2009). In contrast to the emotional attributions that characterize market sentiments, floor emotions explicitly foster and even demand emotional expressiveness. This is noted by a market maker during ethnographic observation: 'Where else than on the trading floor it is more allowed to give free rein to one's emotions?'

We assume that floor emotions are relevant for both, evaluations of current world and market states and valuations of financial assets. Floor traders state that the emotions expressed and perceived on the trading floor are essential to their (e-)valuations, which is illustrated by a bond trader:

What matters is not that everyone gets wind of everyone else's trades. Instead, it's about realizing the sentiment. That's critical.

To this respondent, not ‘trade tracking’ but ‘sentiment tracking’ is the most informative strategy for making good deals. This strategy is driven by the conjecture that to grasp and understand current market conditions, it is essential to capture and combine the dominant emotional states of areas on the floor with knowledge about which assets are traded and which markets are served there. As the above quoted trader further elaborates, the expression and communication of emotions on the floor is critical to this:

If somebody suddenly screws up, to put it simply, then somebody’s going to be annoyed in no time flat. That’s also something that can be sensed. Which is what emotions are for. And there’s nothing wrong with venting, as long as it remains above the belt and the people involved deal with each other in a way that’s fair.

This narrative represents key elements of emotional exchanges on trading floors in our data. Emotions are often expressed involuntarily through verbal or nonverbal channels and are also sensed or interpreted rapidly and effortlessly. Emotional communications are part and parcel of interactions on trading floors and are unanimously described as ‘functional’ for decision-making. Even more, the respondents suggest the existence of floor-specific emotion norms (Hochschild, 1979) that proscribe being emotionally expressive instead of practicing emotional restraint.

The verbal communication of emotion often serves to evaluate the emotional states of colleagues or groups of colleagues located in specific areas of a floor. Aside from explicit requests for the current emotional state of a floor, we also find more subtle descriptions of emotions pertaining to the spatial arrangement of the floor, as one observed situation illustrates:

A sales manager visits the desk and states immediately: ‘Well, you guys are fine here. But in the corner over there a freezing wind blows.’

The manager's observation and communication of negatively valenced emotions in some area of the trading floor becomes an emotional cue for his colleagues at the desk. Combined with insights on traded assets and overall performance, they evaluate this information vis-à-vis other sources when making trades.

Aside from verbal interactions, the perception and communication of prevailing emotions on a floor is also established through nonverbal channels, for instance, gestures, facial expressions, vocal intonations, characteristic modes of behaviour or peripheral-physiological changes (e.g., sweating or a red face). To express anger 'rather loudly', as one trader puts it, is at the same time a means of emotion regulation and of emotion communication, as is evident from our ethnographic observation: 'If someone over there gets angry or cries, I know what is going on.'

The collective dimension of emotions on a trading floor becomes most obvious when groups of traders share a common focus of attention, for instance when expecting certain corporate news, announcements of interest rate changes, or changes in fiscal or monetary policies (Lange, 2018). Shared interpretations of these and other events culminate in the experience and expression of similar emotions, both in terms of the synchronisation of emotion and in terms of shared emotions in a strong 'we-intentional' sense (Salmela, 2012). The result is an emotionally driven and collectively shared consensus on the trading floor, a collective emotional orientation sufficiently long-lasting to guide the way through an uncertain, evolving situation.

This does not mean that floor emotions are generally a favoured strategy of successfully encountering fundamental uncertainty. Interviewees do acknowledge the possibility of collective failure, of interpretative and emotional divergence between a collective floor emotion and sentiments attributed to other market participants or other in-house departments. Referring to the subprime crisis, a trader states that the floor emotion

‘oddly enough, never [was] really bad’, because there was a shared ‘out of the woods’ atmosphere that only later proved to be fundamentally misleading.

Linking these observations back to theory, floor emotions contain elements of both, the phenomenal experience of (collective) emotions (‘emotional calculation’) and the attribution of sentiments and emotions to other actors and markets (‘calculation of emotion’). On the one hand, traders attribute floor emotions to (groups of) traders in close social and physical proximity based on combinations of visual perceptions and verbal communications, whereas market sentiment is attributed to rather abstract entities based on market signals, verbal communications, and discursive constructions. On the other hand, traders become constitutive elements of floor emotions when sharing the same social situation (and emotional experience) with colleagues. Floor emotions are thus rooted in processes of emotional contagion as well as in socially shared concerns and intentions (Collins, 2004).

Conclusion

The Subprime crisis (2007-2009) is perhaps the latest example that illustrates a questionable perspective on financial markets as purely rational economic spheres. Contrary to wide-held belief, quantitative and econometric practices – rooted in formal economic theories and models – cannot guarantee markets to behave rationally. Rather, these calculations much more serve as ‘myths’ to legitimize ideals of rationality that are practically unattainable. This article shows that to develop a more realistic view on financial markets, it is necessary to emphasize their subjective and collective emotional dynamics. We argue that one way to accomplish this is by shedding light on the entanglements of emotions and calculations.

Addressing especially the latter point, we used in-depth interviews with traders and fund managers and ethnographic observations of a trading floor to develop an empirically grounded and inductively derived account of the emotional facets of financial evaluations and

valuations. Building on existing studies of emotion in the economy and on general sociological theories of emotion, we were specifically interested in the ways in which emotional embeddedness and the intersections of emotions and decision-making affect trading financial assets.

Our results emphasize a close interplay between emotional embeddedness (Bandelj, 2009) and financial market actors' subjective feelings and emotional experiences in their calculative practices which can be summarized along two lines: First, *calculations of emotion* are abundant in practices in which various sources of information are deliberately used to assess the emotional states of entire markets and other market participants. This becomes particularly obvious in the concept of market sentiment, where the acquisition of knowledge about other market participants' emotions is essential to evaluate the status quo of a given financial market. Furthermore, attributions of emotional semantics to financial markets, fuelled by price observations, mathematical sentiment modelling, and communications with other market participants, facilitate making sense of these markets. Market sentiment in this perspective is calculated in an almost rational fashion to inform trading decisions. This also becomes apparent with respect to floor emotions on trading floors as arenas of verbal and nonverbal emotional exchange: Traders and fund managers routinely calculate emotions by implicitly or explicitly inquiring about the current sentiment in different areas of a trading floor or about a predominant collective floor emotion to inform their own trading decisions.

Second, *emotional calculations* involve calculative practices characterized by phenomenal and experiential modes of evaluation and valuation, also in view of addressing actors' emotional embeddedness. Here, embeddedness into the ritualized face-to-face interactions on trading floors facilitates calculation through the often subtle and bodily interactions of prevailing emotions and cognitions. In particular, this is illustrated by the concept of market feelings that points at how subjectively experienced feelings serve to

evaluate a given world and market state and to extract imaginations of imminent market futures (Beckert, 2016). Hypothetically, at least, we assume that market feelings are the specific experiential consequences resulting from attributions of market sentiments and the involvement in (collective) floor emotions. Thus, one's current status of emotional embeddedness becomes translated into a genuine subjective emotional experience rooted in different qualities of assessments of market sentiment and floor emotions. These findings contribute to further developing existing theories by concurrently attending to individual feelings and collective emotions that arise from different forms and contexts of social embeddedness.

Possible limitations of our study mainly stem from investigating only a comparably small fragment of trading in the financial sector and by drawing respondents exclusively from the German financial sector. Moreover, because the study relies on participant observations and interviews, emotions can hardly be captured in their 'essence' and our conclusions are always mediated by respondents' subjective accounts thereof. Therefore, future research might want to consider alternative measures of emotion in real-world social situations and interactions, for instance using measures of emotion in speech and facial expressiveness.

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