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HURDLES AND OBSTACLES IN MONETARY POLICY COMMUNICATION. A MODEL FOR THE COMMUNICATION BETWEEN THE CENTRAL BANK AND MARKETS

UTRUDNIENIA I BARIERY KOMUNIKACJI W POLITYCE PIENIĘŻNEJ. MODEL KOMUNIKACJI MIĘDZY BANKIEM CENTRALNYM A RYNKAMI

Abstract: Central bank communication has become an essential part of monetary policy in recent years. Against the background of the zero interest rate policy, conventional monetary policy instruments have lost their effectiveness, and the management of market participants' expectations by means of appropriate communication has become an essential part of monetary policy. In this paper a new model of the communication process between the central bank and financial market players is elaborated, in particular exploring the obstacles and hurdles in the transmission of information from sender to recipient, empirical data are also reported for several stages of the new model. For efficient expectation management, both the selection of information by the central bank as well as the transmission path of this information is important as indirect communication can lead to information distortions. Last but not least, the recipients of the information, as people with a limited capacity and variable readiness to absorb it, play a central role in determining what information actually reaches

them. Appropriate communication that takes these obstacles and the recipients' psychology into account can thus significantly increase the efficiency of monetary policy.

Keywords: central bank communication, monetary policy, financial markets, *forward guidance.*

Streszczenie: Komunikacja banku centralnego stała się w ostatnich latach istotną częścią polityki pieniężnej. Wobec polityki zerowych stóp procentowych konwencjonalne instrumenty polityki monetarnej straciły na efektywności, a zarządzanie oczekiwaniami uczestników rynku za pomocą odpowiedniej komunikacji stało się istotną częścią polityki pieniężnej. W artykule opracowano nowy model procesu komunikacji między bankiem centralnym a uczestnikami rynku finansowego, w szczególności badając utrudnienia i bariery w przekazywaniu informacji od nadawcy do odbiorcy. Przedstawiono również dane empiryczne z kilku etapów nowego modelu. Dla efektywnego zarządzania oczekiwaniami ważny jest zarówno wybór informacji przez bank centralny, jak i ścieżka ich transmisji, ponieważ komunikacja pośrednia może prowadzić do zniekształceń informacji. I wreszcie, odbiorcy informacji, jako osoby o ograniczonych zdolnościach i zmiennej gotowości do ich przyswajania, odgrywają centralną rolę w określaniu, jakie informacje faktycznie do nich docierają. Odpowiednia komunikacja, uwzględniająca te przeszkody i psychologię odbiorców, może zatem znacznie zwiększyć efektywność polityki pieniężnej.

Słowa kluczowe: komunikacja banku centralnego, polityka monetarna, rynki finansowe, *forward guidance*.

1. Introduction

In January 2020 the European Central Bank (ECB) launched a revision of its monetary policy strategy. Under the name "ECB listens"[1], the public was asked for their input into the process of strategy revision. Looking into the details of the strategy review, one module of the strategy is entitled "Monetary policy communication" (ECB, 2020). These two examples make it clear that communication policy has become an essential part of central bank policy in recent years. Communication with the public does not only extend to the accountability that the central bank as a public institution owes to the population, but communication also plays an important role within the monetary policy strategy itself. Its importance has increased all the more since the conventional instruments of monetary policy – above all the key interest rate – have reached their limits with its reduction to zero percent. This makes it all the more important to manage market expectations and these can be influenced above all through audience-directed communication. The management of market expectations has found its way into the central bankers' toolbox under the term 'forward guidance' and is now practiced by all the major central banks. Blinder's (2018) remarkable predictions about the central banks'

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[1] See the ECB's Internet portal on https://www.ecb.europa.eu/home/search/review/html/form. en.html.

communication strategy in the coming years have turned out to be accurate despite the fact that predictions in the area of monetary policy remain risky. On the current topic, he predicted that the forward policy will be used as an instrument of monetary policy (prediction 3). In his prediction 4, he stated that

"Central banks will keep trying to communicate with the general public, as they should. But for the most part, they will fail" (Blinder, 2018).

Most interestingly, he argued that a major problem for central banks seems to be the lack of a communication model, i.e. how to interact with the public. For example, Kumar et al. (2015) studied the survey results on inflation expectations and knowledge of monetary policy among (mostly small) business managers in New Zealand. They not only reported huge cross-sectional variance in expected inflation rates, but also that inflation expectations were not at all directly linked to the Reserve Bank of New Zealand's (RBNZ) widely-publicized target. It was concluded that business managers apparently had not received or believed the messages that the RBNZ had sent repeatedly. Therefore, communication is a two-way system and any communication strategy of central banks have to take the recipients of central bank information into account. The present approach addresses this problem and, specifically, concentrates on the recipients in this communication process.

The research field of central bank communication has developed since the 1990s. Whereas before that time, market surprise was considered the means of choice; since then the view has gained ground that market expectations must be managed and influenced by the central bank. Blinder et al. (2008) provided a good overview of the different approaches to central bank communication. With the challenges of the financial crisis for monetary policy and the increased importance of forward guidance, this field of research has received a new boost (see the overview by Moessner, Jansen, and Haan, 2017). While the focus has so far been mainly on the reaction of the financial markets, there is now a growing interest in the inflation expectations of private households, and thus communication with the general public has become more important (de Guindos, 2019; Coibion, Gorodnichenko, and Weber, 2019; Christelis, Georgarakos, Jappelli, and Van Rooij, 2020). As the general public can be described as a heterogeneous group, with e.g. different educational background and experience, this increases the difficulties of communication. This paper therefore focuses on a theoretical analysis of the communication process between the central bank and market participants, in which not only economic considerations but also psychological aspects play an important role.

The paper is structured as follows: Section 2 provides a brief overview of the process of monetary policy decision-making. Section 3 then develops a communication model between the central bank and the markets, which highlights the different stages of the communication process and the difficulties involved. This section is supported by the empirical results of a survey among financial market players in Germany. Section 4 concludes.

2. General overview of the communication between the central bank and financial markets

Based on the monetary policy strategy, a close link between monetary policy decisions and financial market operations with several stages was postulated by Dittrich and Wohlmann (2018; see Figure 1). Their model illustrates the fact that communication plays a crucial role between the central bank and the financial markets as it determines the effectiveness of the management of expectations and thus the efficiency of monetary policy (see also Winkler, 2000; Haan, Eijffinger, and Waller, 2005; Hayo and Neuenkirch, 2015; Hüning, 2016). Furthermore, the role of psychological characteristics, such as constraints and mental models, in order for individuals to be able to adequately decode and represent the central bank's policy communication, is emphasized.
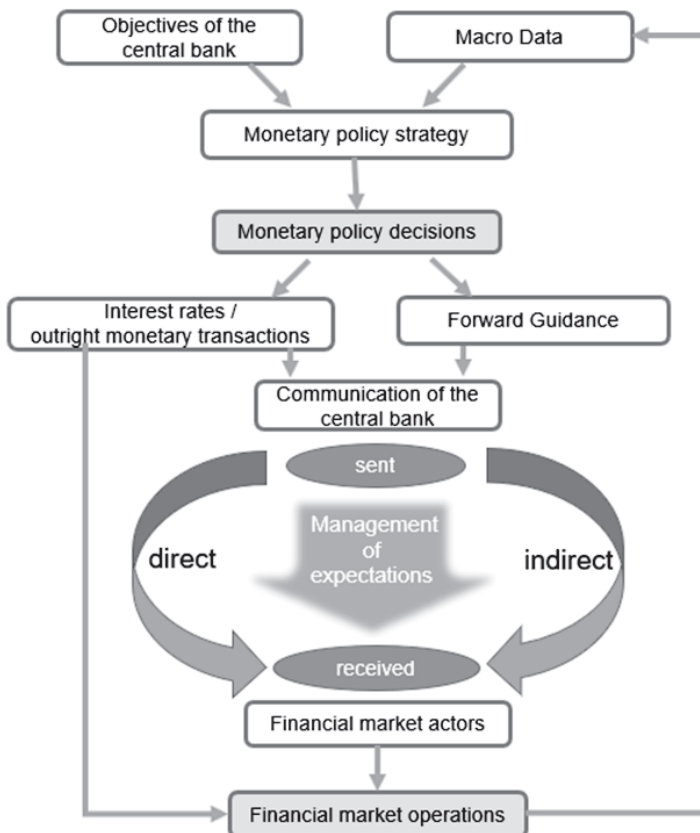

Fig. 1. Model of the central bank's monetary policy communication

Source: (Dittrich and Wohlmann, 2018).

The central bank's targets are compared with the current macroeconomic data, and the degree to which they have been achieved was examined (Figure 1). The monetary policy strategy is developed accordingly and monetary policy decisions are implemented, although it has to be stressed that monetary policy decisions do not only include concrete measures, such as changes in key interest rates or asset purchase programmes, but also 'soft factors' such as indications of the future direction of monetary policy in the form of forward guidance. Thus it seems most likely, that policy directions such as forward guidance should be taken as predictions rather than a real commitment.[2] Indications for such a view can be found in the conditional nature of such policy statements. "If x,y,z turns out (or not) then interest--rate policies (a,b,c) will be put in place", or as Cœuré (2018) puts it, as central banks aim for transparency:

"First, it is to publish policymakers' projection of the future path of short-term interest rates conditional on the macroeconomic outlook".

Monetary policy decisions are communicated by the central banks via various channels. However, they do not always reach the financial market players directly, and information intermediaries in the form of news services, journalists and analysts are often also involved. The monetary policy measures taken by the central bank (e.g. interest rate cuts) and the information received from financial market players on future monetary policy are then reflected in the transactions carried out on the financial market. If, for example, key rates have been lowered and an indication of further easing is given, financial market data will in all probability develop differently than if an end to the easing is signalled.

Since the financial market players are not only supplied with information directly by the central bank, but also receive information on monetary policy via numerous other channels, it is necessary to take a closer look at the communication process between sender and receiver. Finally, the effectiveness of the management of expectations depends to a large extent on the fact that the information from the sender is also received unadulterated by the receiver. Again, one of the ECB's representatives puts it this way:

"First, it is often more important **how** central banks communicate than **what** they communicate… […] Second, even a credible interest rate path may cause misperceptions" (Cœuré, 2018).

Consequently, if one takes into account the human factor in this process, namely misperceptions and individuals' mental representations of information, it becomes clear that it is not only a question of the unadulterated transmission of information. Furthermore, the limited rationality of the market participants can be a problem and may lead to a distorted information perception. Therefore, a model of communication in the sense of a rational information transfer cannot reflect the

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[2] See below 3.1.2, and Figure 3 for further details.

complexity of communication. For this reason the communication steps between the central bank and financial market participants were examined in more detail and illustrated in a new model.

3. Model for monetary policy communication

As psychologists have repeatedly noted, information that is announced or sent is often selectively received, then badly processed, used insufficiently for one's own actions or hardly noticed when learning (e.g. Hargie, Dickson, Tourish, and Hargie, 2004). As shown in Figure 2, three phases of the information transfer process between the central bank and financial market participants can be highlighted:

   1)   the effectiveness of communication, e.g. the degree of understanding of the message,

   2)   the type of knowledge transfer, e.g. direct or indirect transfer,

   3)   the factors influencing the transfer of information, e.g. personal, organisational or even financial, technical factors.
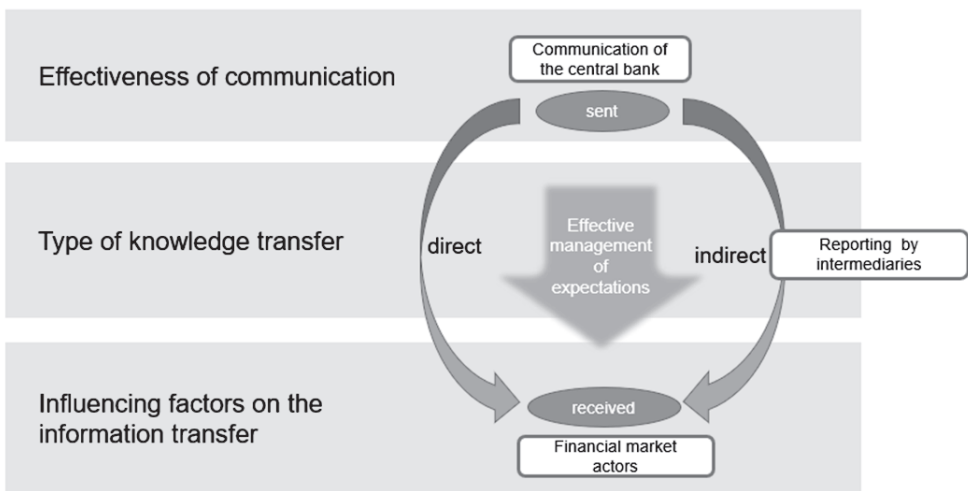

Fig. 2 Phases of the central bank's communication process

Source: (Dittrich and Wohlmann, 2018).

    In the first phase, the sender of communication – the central bank – determines what and how it communicates. This selection largely determines the effectiveness of the communication. In the second phase, the type of knowledge transfer, i.e. whether the communication is direct or indirect, is the issue. In the case of indirect communication this is associated with risks of, among others, information distortion. The third phase of communication describes the actual information reception by

the recipient. Here the information provided is filtered again before it is recorded. In a linear model such as the sender-receiver model, communication is considered as a one-way process where the sender is the only one who sends message and the recipient does not give feedback or a response. The message signal is encoded and transmitted through channels in the presence of noise. This model was introduced by Shannon and Weaver (1949), whose model of communication was a mathematical model used for technical communication or machine communication (e.g. telegraph, phone). A linear model has widely been applied in mass communication (e.g. TV, radio). In Shannon and Weaver's model, if the channel does not have distorting elements or noise producing elements, the communication is successful. For a long time the original or some slightly modified versions of it have dominated the business world, the sender has been seen as the dominant part in a linear model of communication, making mainly the sender responsible for the success or failure of communication. The importance of this general model seems reflected in the fact that it was used in various disciplines, including communication, psychology, management and marketing (e.g. Bittner, 1988; Burgoon and Ruffner, 1978; Kotler 1994; McQuail, 1987; Robbins, 1991). However, nowadays a more holistic model of communication seems to capture the multidimensional character of communication better compared to a linear model.

Such a simplistic linear model assumes that communication has a particular beginning and end, but in the social media world, communication seems continuous and multifaceted, may not happen in turns, and more than one message can be sent at the same time. Furthermore, human communication is mostly circular and not linear, as the audience seems to play an active part in communication. The sender has to encode the message, but the recipient must be able to decode the same message. Even if the communicator may have good messages, he or she might have difficulties in encoding the message properly, i.e. in putting ideas into a suitable form of words. The ability to decode not only depends on the encoding but, significantly, also on the psychological set-up of the recipients and often requires them to play an active part in processing the information. For example, the recipient can be too quick to jump to conclusions or becomes defensive; he/she may be offended by an unjustified interruption, leading to incomplete information, or a premature assessment of the information. Most importantly, this model has no concept of feedback, which makes it inapplicable to central bank communication. Central banks need to know if the communication was effective or not. The faults of the linear model become even more evident in the digital age when it seems more and more difficult to identify the effects of the sender and recipient in an on-going communication flow. Modern models of communication incorporate the concept of multiple senders and recipient, the possibility of different forms of decoding and representing the information and, importantly, include the effect of influencers in the communication process (see Dittrich and Schulz, 2020). The following section analyses the three phases of the communication process (see Figure 2) in more detail.

3.1. First phase: information selection by the central bank

3.1.1. Objectives of the central bank

The information that a central bank discloses is selected from a variety of perspectives, one of them being that public institutions should be transparent, which is justified by their accountability to the public. As Haldane and McMahon (2018) noted, the success of a communication strategy should not be measured by the overall number of people listening to the message, but rather by the additional audience reached beyond the financial specialists picking up the communication. The accountability applies equally to all public institutions. For central banks in particular, a second aspect is important for the provision of information, namely – as already mentioned above – the possibility to increase the efficiency of monetary policy by controlling expectations, and not only those of the specialists. This is the aspect pursued in the following section. Recently, Coibion et al. (2020a, 2020b) assessed the prospects for central banks using inflation expectations as a policy tool for stabilization purposes. They concluded that there is robust evidence of the causal effect of inflation expectations on the decisions of households and firms, and suggest that this tool has potential despite some limitations. For a comprehensive examination of the role of inflation expectation in emerging markets and developing economies, as well as the success factors for anchoring expectations, see Kose et al. (2019). In the case of Poland, inflation targets and a floating exchange rate regime were adopted at the same time and may have aided to anchor expectations.[3] It can be also observed that forward-looking references in press releases have nowadays become significantly more important than in the past (Ehrmann and Talmi, 2017).

A third aspect of transparency is credibility. Public institutions must be credible in order to be able to perform their tasks well. The credibility of communication is, even if it may sound confusing at first, both a prerequisite and a consequence of trust. On the one hand, trust can be seen as the result of a credible communication, so credibility seems to be the preliminary stage of trust. On the other hand, it cannot be ruled out that trust must already exist in order to be able to accept information as credible at all. One could therefore speak of a kind of symbiotic relationship between credibility and trust (Derieth, 1995; Fehr, 2007). At the same time, in the case of central bank communication, credibility can also be subsumed under the aspect of the efficiency of monetary policy, since credibility is important to increase the effectiveness of monetary policy (see also Belke, 2017). Yet again, it seems important to note that in the current approach, credibility is seen as important far beyond the core of the central banks' audiences, e.g. the technical specialists and financial analysts. Businesses, market actors and, finally, the general public are also influenced by the central bank's credibility. As Haldane (2017) forcefully stated, the rising impact of central banks has to be balanced by the stronger influence of

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[3] For a more detailed discussion of the situation in Poland, see Kose et al. (2019).

modern communication strategies, including openness and transparency. As trust is seen as crucial for the effective operations of central banks, the study emphasised a serious issue, namely the dwindling trust between the institutions and the general public, i.e. a trust gap or 'the great divide'. In order to build trust, it can be suggested to look closely at the changing nature of trust, the media and the language used. Nevertheless, it seems equally necessary to concentrate on the human factors and how the central bank is managing the market's expectations.

3.1.2.   Determinants of information selection

At the beginning of the communication process between the central bank and market participants, the central bank selects information (see Figure 3). The importance of this process is particularly evident in two examples of failed communication: the Fed's statement in May 2013 to reduce its bond purchases, known as the "Taper Tantrum", took the markets by surprise and led to sharp price swings; in August 2013 the Bank of England introduced a threshold for the unemployment rate in its Forward Guidance, which it dropped again in February when the unemployment rate approached the threshold faster than expected.
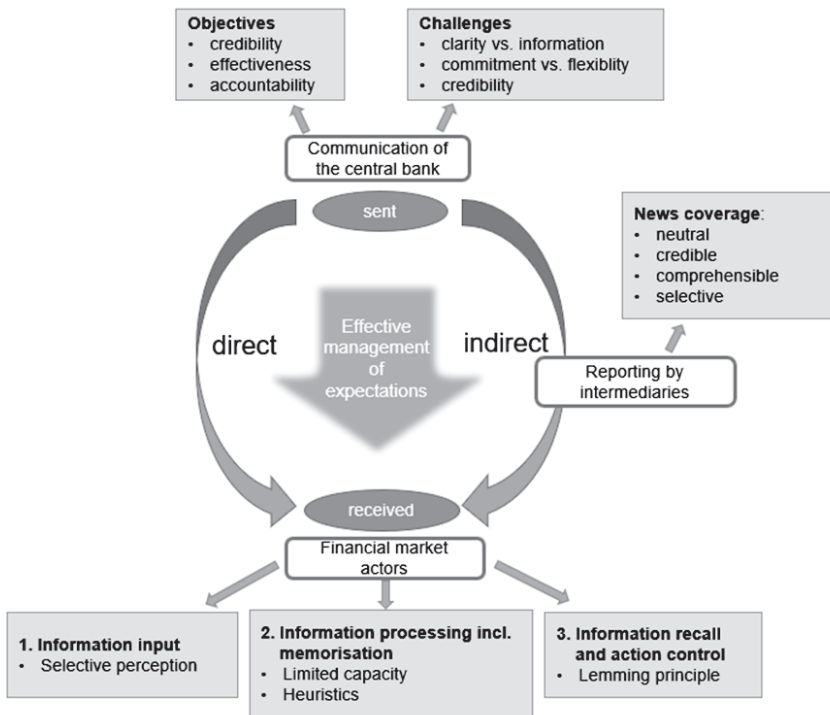

Fig. 3. Model of the central bank's management of expectations

Source: (Dittrich and Wohlmann, 2018).

From the perspective of *clarity vs. information*, the question arises whether the central bank should rather communicate clearly (and simply) or disclose detailed and complex information which could distract from the actual message and lead to misunderstandings. In order to be able to realise the positive effects of the management of expectations described above, it is essential that the forward-looking information is correctly understood. Uncertainty about the interpretation of the indications then leads to uncertainty about the effects on expectations (Woodford, 2013). Against this background, a clear message is preferable, however if the message is clear, details of information are withheld, which could reduce its benefits (Morris and Shin, 2007). Empirical studies indicate, however, that too much information is not necessarily more useful, but can even reduce the effectiveness of communication (Morris and Shin, 2002).

The findings from the theory of 'rational inattention' show that from the point of view of some market participants, it makes sense to only 'read information crosswise'. These market participants then form their own summary after having skimmed through the information. Therefore, it seems to make sense that the central bank anticipates them by summarizing the most important points and thus excludes possible errors in information processing. Supporters of a rational inattention theory therefore recommend a brief summary of the most important points and then a detailed presentation with more details, which is then directed only at interested parties (Sims, 2010). This recommendation is followed by major central banks in practice: with the introduction of its Forward Guidance, the European Central Bank formulates a clear message to the markets, which is then followed by more detailed information on monetary policy decisions (ECB, 2014).

However, the preference for a clear and simple message over the disclosure of more complex information carries risks with regard to the second aspect, which is subsumed under the heading *commitment vs. flexibility*. The central bank's communication is intended to provide guidance on the future direction of monetary policy, which applies only under certain predefined circumstances. This is not a binding promise ('commitment') that will come to pass in any event. The central bank needs to keep its flexibility to react to changing circumstances. However, it remains within the central bank's discretion to decide when the framework conditions have changed sufficiently to deviate from the announced orientation. It was with good reason that the Swedish central bank, for example, always repeats in its monthly report: "This repo-rate path is a forecast, not a promise" (Sveriges Riksbank, 2018).

Yet central bankers themselves may also feel more bound by their announced forward guidance than the underlying economic development would require (Blinder, Ehrmann, Fratzscher, Haan, and Jansen, 2008). In order to appear as credible as possible, they could develop a tendency to decide in favour of the already published orientation in case of doubt. If, for example, the forward guidance has held out the prospect of maintaining a low interest rate level, there could be a tendency to decide against an interest rate hike, even if the change in economic conditions would allow

this. Monetary policy decisions would then always be subject to a certain bias, and the forward guidance could thus become a self-fulfilling prophecy.

An important prerequisite for the effectiveness of forward guidance is its *credibility*. Financial market participants must be convinced that the central bank will implement the specified guidance, provided the conditions are met, as only then will they adjust their expectations accordingly and the expected development is anticipated in the current long-term interest rate level.

If, however, economic developments have been incorrectly assessed by the central bank or if changes in the economic framework conditions frequently occur as a result of exogenous shocks, this can result in a frequent reorientation of monetary policy. Although the reorientation is then objectively justified, the frequent changes may nevertheless impair the credibility of the central bank. If the credibility of the central bank declines, economic agents will no longer base their decisions so strongly on the information provided by the central bank and the desired effects of the forward guidance will no longer occur (see also Cœuré, 2013; Issing, 2005). At the same time, however, good communication with the markets creates credibility and a credible policy gives the central bank greater room for manoeuvre and thus more flexibility to decide (Dincer and Eichengreen, 2014). It should also be noted that once credibility has been lost, it will take a long time to rebuild it (Bordo and Siklos, 2017).

Communication-specific obstacles can also already occur at this point:

- The communicator has no clear idea of the message to be sent.
- The communicator has a clear idea of the message to be sent but has difficulties in conveying the idea in a clear message in a comprehensible way, e.g. he/she cannot find the right words.

These problems are unlikely to arise in the central bank's written communication, but they may occur when answering journalists' questions at the press conference.

The choice of information provided by the central bank is thus caught in a trade--off between clarity, flexibility and credibility. Furthermore, the central bank must also take into account the communication channels when providing information in order to be able to assess whether the information it provides will reach the intended recipients. For this reason, the communication channels are examined in more detail below.

3.2. Second phase: type of knowledge transfer

The central bank's communication is aimed at various target groups: financial market participants, institutional actors and the general public (Bini Smaghi, 2007). Since the present contribution focuses on central bank communication to increase the efficiency of monetary policy, the following primarily refers to the target group of financial market players, and examines their communication channels. When studying mass communication, Maletzke (1998) highlighted the importance of understanding and addressing the target audience adequately. For example, a text in

a printed newspaper has a different style and outlook than a text for the social media. Recently, the multi-dimensional lean-knowledge-to-action model to highlight essential processes in knowledge transfer has been suggested (Dittrich and Biniok, 2018; Dittrich and Schulz, 2020). This model is based on a holistic approach pointing to all aspects of knowledge management that pertain to knowledge translation activities (e.g. generation, storage, distribution, application etc.) as well as managerial levels (e.g. strategic, operational levels). Holistic approaches are defined by the combination of both technical and human aspects of strategic communication. It is suggested that linking selected information to specific human actions in markets can be seen as the basic process of knowledge transfer. It is pointed out that the understanding of knowledge transfer seems incomplete without the substantial extension of the sender-receiver model, as discussed above. For example, nowadays a new role for typical intermediaries of financial information, such as analysts, has surfaced in the form of knowledge brokers. By integrating a knowledge broker (knowledge mediator/change agent), the acceptance of the user groups can also be increased (Glegg and Hoens, 2016). One of the most important insights for successful policy communication is being aware of the level of directness (or indirectness) that people or institutions use in their messages. Focusing on communication channels, the role of directness and the evaluation of central bank's financial information by financial experts has empirically been investigated and is presented below.

3.2.1. Direct communication

Ideally, the communication goes directly from the central bank to the recipient. This could happen in the form of a press release or a press conference, as well as live broadcasts of press conferences on TV. Even short ticker reports that only cite facts could be considered as equivalents to direct communication. The advantage of direct communication is obvious: there is no risk of information being falsified or selectively passed on by intermediaries.

Although central banks provide a lot of information directly via their websites, they have no influence on the choice of the communication channel used by market participants, who generally obtain only a small proportion of the possible information via direct communication.

A survey[4] among financial market players showed that the direct information channel, e.g. in the form of a live broadcast of a press conference, plays a major role and comes straight after the news ticker in its importance (see Figure 4). Analysts' comments, TV reports and the daily press are the third most important information channels.

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[4] The following results are based on the authors' non-representative survey conducted in 2016 and 2018 among large commercial banks and asset managers in Germany. For all the respondents, ECB monetary policy was important for their daily work and they therefore had to keep themselves constantly informed about it. The sample size was n=133.
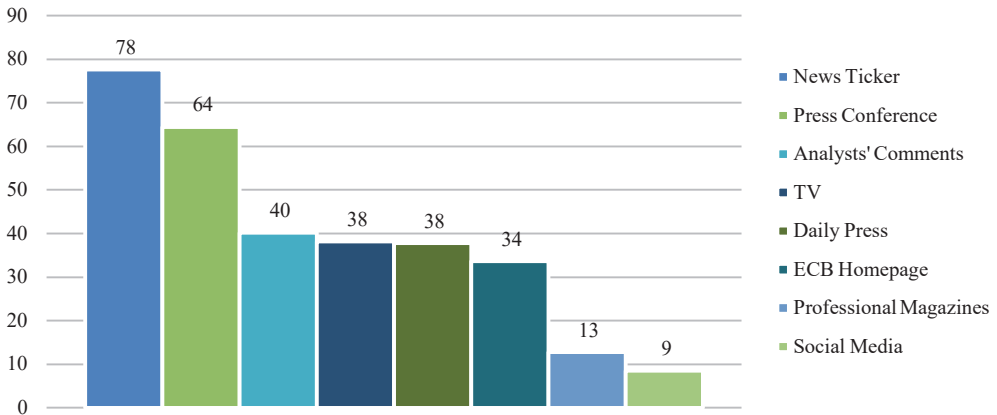
Fig. 4. The importance of indirect information channels compared to a press conference (direct) as the percentage of the respondents who considered the information channel important or very important

Source: own survey.

Out of the information provided directly by the ECB, the press conference is by far the most widely used source of information by the respondents, accounting for 63.4% (see Figure 5). In second place, were speeches by Council members, followed by the macroeconomic projections on inflation and growth as well as the minutes of central bank meetings.
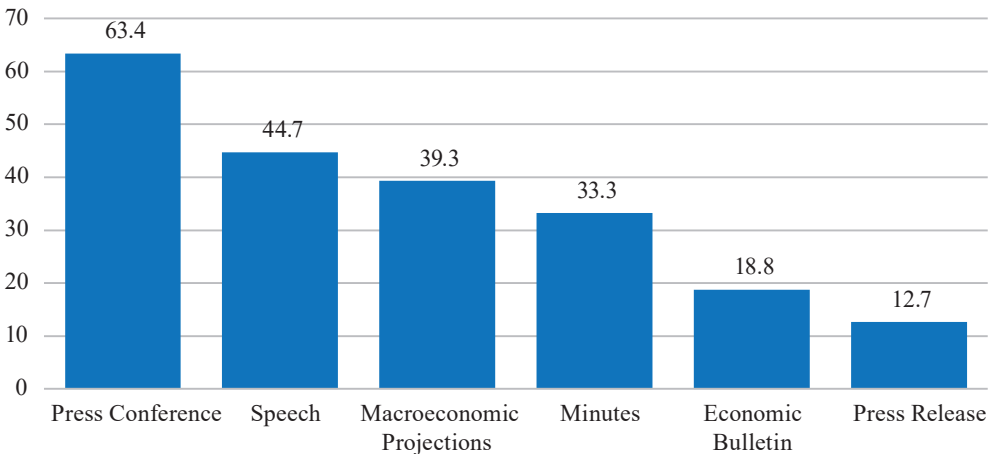

Fig. 5. Use of different direct information channels as the percentage of the respondents who considered the information channel important or very important

Source: own survey.

The survey results also show that one information channel is rarely used alone. Financial market participants tend to inform themselves about monetary policy in different media in parallel. On average, two to three information channels are used simultaneously. Survey participants who use the direct information channel of the ECB in the form of a live broadcast of a press conference obtained additional information via two other channels on average, i.e. 35% also used the news ticker. Then, the analysts' comments, TV, daily press and the ECB's homepage followed in roughly equal measure (15%). Considering that the news ticker, at least for the first reports, is very close to the original and often transmits literal quotations, it comes very close to the direct transmission of information. This stresses that the direct channel plays a dominant role for financial market participants. At the same time, however, the survey also shows that this information is complemented by information through indirect channels – and here, analysts' comments come first, which in particular are likely to have a strong opinion bias, so that the question arises as to what extent financial market players' perception of information is affected by the use of indirect information channels.

3.2.2. Indirect communication

Further empirical studies show that direct and indirect communication channels are used with roughly the same intensity when interest rate decisions are announced; in the case of general information on monetary policy, indirect communication even predominates (Hayo and Neuenkirch, 2015). Moreover, different channels complement each other, so that complementary use makes sense (Dräger, Lamla, and Pfajfar, 2016; Coenen et al., 2017).

In addition to the news ticker, indirect communication channels include TV channels, information by e-mail and the Internet, as well as the print media (daily press or magazines). A common characteristic of these media is that they pre-select the information according to the necessities of their target groups (Hargie et al., 2004; Dräger, Lamla, and Pfajfar, 2016).

In addition to the information channel, the type of information received also varies. Besides the – largely objective – transmission of facts, comments on monetary policy decisions also play a major role in indirect communication. Therefore, indirect communication does not only imply a pre-selection of information, but possibly also an interpretation by the intermediary or supplementary information.

Selection and supplementation can change the original content of the central bank's communication. In this way, systematic distortions in reporting could be identified. It was found that reporting was more central bank-friendly when the monetary policy decision was explained in detail. Surprising decisions, however, were received more negatively in the press. Furthermore, the prevailing economic environment was also a decisive factor in the tone of the reporting: if the inflation rate was already above its target level, central bank decisions were reported more negatively in the press (Berger, Ehrmann, and Fratzscher, 2011).

The reporting by intermediaries therefore needs to be re-examined critically as to the extent of its influence the content of the information sent by the central bank. The *neutrality* of the intermediary plays a role here: does the person pass on the information in an objective manner or is he or she interested in steering the content of the communication in a certain direction? For example, analysts' comments could be linked to business interests, such as encourage customers to reallocate their portfolios in response to monetary policy decisions. In this case, the intermediary would no longer be neutral, but would have a tendency to interpret the information sent by the central bank in terms of its business interests.

Even an intermediary with no interest in follow-up transactions may have an interest in not passing on information in a balanced and objective manner, because, as Velthuis (2015) and Doyle (2006) showed, journalists and the media do not focus on the neutral transmission of information, but rather commercial interests to gain readers must be taken into account when selecting information. A striking expression ("whatever it takes" (Draghi, 2012) sells better than the complex sentence "The Governing Council, …, may undertake outright open market operations of a size adequate to reach its objective"(Draghi and Constâncio, 2012) from the accompanying press release. Commercial interests can also lead to the fact that the content of reporting is increasingly oriented towards the wishes of the reader, so that in addition to pure information, 'storytelling', plays an increasingly important role (Mullainathan and Shleifer, 2005). In addition to reporting, interpretation and entertainment are becoming more important, which increases the risk of information distortion.

The commercial interests of information providers may also be reflected in the timing of the information rather than in its content. In the USA, for example, considerably more news on monetary policy was published in the news services on Fridays than on any other working day (Neuenkirch, 2014). Similarly, central bank communiqués were not reported if important economic indicators were published on the same day (Neuenkirch, 2014).

Besides the neutrality of the intermediary, the *comprehensibility* of the reporting plays a role. First of all, it can be assumed that the recipient selects the medium that best corresponds to his/her level of knowledge and thus reports in a way that is understandable for him/her. It should be noted, however, that the employer often decides about the information media available in the company and the employee is bound to use them. In this case, the problem of comprehensibility can come into play. In addition, linguistic comprehension problems may occur as press conferences are usually held in English and not every financial market player is equally familiar with the subtleties of the English language.

The *credibility* of the information broker plays a role in that it increases or decreases the acceptance of the information conveyed and also influences the attention with which this information is followed. In case of doubt, an implausible intermediary will not be used as an information channel at all. Studies also confirm that the information media used are generally considered credible (Hayo and

Neuenkirch, 2015). Recipients are more likely to accept information if they recognise objectivity in communication, which increases the credibility of the information.

The results of the authors' survey show that a high degree of credibility is attributed to all frequently used information channels (see Figure 6). The highest degree of credibility is perceived with the direct information channel, namely a live broadcast of a press conference, where almost 95% of the respondents attest it as 'trustworthy' to 'very trustworthy' statement. In second place in terms of trustworthiness is the news ticker, which is also distinguished by its up-to-date and comprehensible presentation. In terms of comprehensibility, the news ticker is actually assigned the highest values as nearly 70% of the respondents rate it as easy and very easy to understand. Obviously the brevity of the information that prevails in news tickers is perceived as easily understandable.
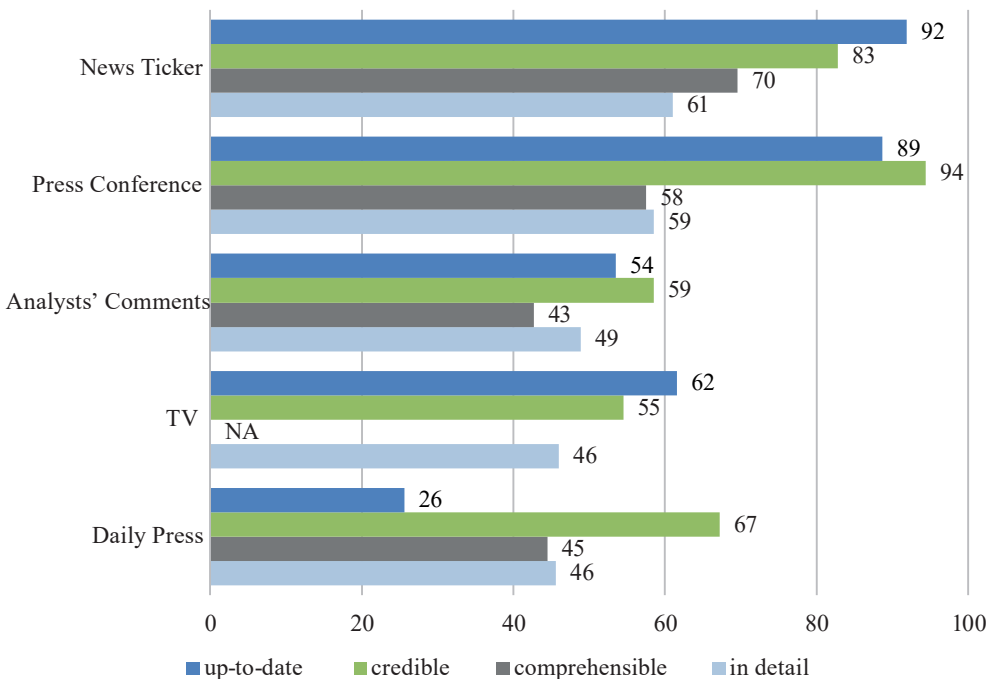

Fig. 6. Properties of information channels as the percentage of the respondents who attributed these four characteristics to the information channel

Source: own survey.

In addition to the above-named information channels, informal communication also matters: over 80% of those surveyed also use discussions with colleagues to obtain information and opinions on monetary policy decisions. However, not only the information available to recipients is decisive, but also their individual capacity to absorb it efficiently plays a role.

3.3.   Third phase: processing of Information by the recipient

At this stage, the information that is now factually available to the recipient is again subjectively filtered by the recipient. Both emotional and cognitive factors play a role here, determining the extent to which the recipient takes in information and how he or she interprets it if necessary. A basic assumption of this study's approach is that the information structure and the characteristics of financial market players systematically influence individuals' investment decisions as well as market outcomes. The thinking process does not work like a linear interpolation calculator, i.e. filling gaps between known data points or registered information. Instead, the human mind often processes information using shortcuts and emotional filters, i.e. creating unexpected and completely new associations and/or connections often using detours in information processing instead of linear interpolations. These processes influence financial decision-makers such that financial market players often act in a seemingly irrational manner, routinely violate traditional concepts of risk aversion, and make predictable errors in their forecasts. These problems are pervasive in investor decisions, financial markets, and corporate managerial behaviour. The impact of these suboptimal financial decisions has ramifications for the efficiency of communication, financial markets, and the performance of central banks. Communication-specific obstacles and the psychological information processing characteristics of the market participants should be taken into account.

3.3.1.   Communication-specific barriers

Obstacles can be very communication-specific and are assigned to the following situations, among others, all of which are found or used in financial markets:

- The recipient processes the information only very superficially or too briefly and develops hasty opinions or behaves defensively. The quality of the message therefore suffers considerably and leads to misconduct on the part of the recipient. Such incomplete processing is often closely related to the person or the 'ego' of the recipient.
- An unsuitable environment can considerably limit the intended effect of the communication. For example, construction noise during a press conference is not a suitable amplifier of the communication.
- Rumours almost always arise as a substitute for formal communication or clear message. Although correct information can often be disseminated, rumours are usually by definition false information and do considerable damage to effective communication.

3.3.2.   Information perception

The beginning of the information process is marked by perception. Financial market players perceive both external events and internal signals. External events can be understood as, for example, press releases of the central bank, while internal signals

primarily refer to the emotions and expectations of financial players. The relationship between internal and external information sources can be described as follows:

- The higher the investment of the financial market player, the more importance is attached to central bank information.
- The more unreliable the financial market player's internal information, the greater the need for external information from the central bank.
- The more favourable the cost/benefit considerations in the procurement of information, the greater the demand for external information.

Regardless of communication-specific obstacles, difficulties in information transfer often arise due to *selective perception*, which often leads to incorrect perception. Psychologically, such processes as selective attention or limited processing resources can be seen as the underlying cognitive mechanisms for highly biased or incorrect information processing (Luck, Girelli, McDermott, and Ford, 1997; Alvarez and Cavanagh, 2004; Cowan, 2010). These kinds of difficulties correspond to the commonly heard or used expression 'communication problems'. For example, communication between members from different departments is often perceived as more difficult than between members of the same department. The topic of communication problems also applies to communication between insiders and outsiders. In this case, communication is between insiders (the central bank) and outsiders (the financial market players), and the central bank decides to what extent it wishes to provide insight into its decision-making. In this aspect, the perception of messages does not seem unlike the perception of objects, i.e. perception depends on the limited resources of information processing thus, finally, narrowing the usability of the information provided. When examining the latest developments on the stock market, one seems to narrow down the information to two stages, first the industry branch and second, the particular stocks.

3.3.3. Information processing and evaluation

The limited absorption capacity, as well as filtering, are mainly shaped by the interaction of cognitive and emotional processes. Both in the case of an overwhelming amount of information and of a lack of information, or a lack of assessment of probabilities, that of insecurity or even uncertainty, behavioural automatisms are activated which drive the decision-making process. These automatisms are also called decision *heuristics*. Heuristics thus increase the probability of decision--making when information is either not available or at least not sufficiently available. The advantage of heuristics is that the preparation of decisions can be made very efficiently, especially by taking emotional factors into account. For example, factual probabilities are often underestimated, which can lead to the so-called base rate error, and independently of this, also subjective preferences are overestimated, which contributes to over-optimism. In addition to the clear advantages, these examples show the problems of such decision heuristics. These processes can lead to distortions and misjudgements, also called biases. In the monetary policy decision,

for example, the first step is often to seek confirmation of one's own expectations, and statements to the contrary are subjectively given less consideration.

An *absorption capacity limited* by cognitive and emotional factors means that more information does not necessarily lead to greater transparency and a better management of expectations by the central bank. The information absorption and processing capacity of the recipients has a decisive influence on the success of the management of expectations. As central banks are increasingly recognising the limitations to communicate with the general public, they have started to explicitly tailor their communication strategies to a more diverse audience. Binder (2017) studied the role of rational inattention, financial literacy, and political communication as factors for limited household receptiveness to central bank communications. If the published information is interpreted differently, more information may even reduce its effectiveness (Gaballo, 2016; Tutino, 2016). In fact it was found that financial market participants were more interested in the core statements than in information details, so that the marginal utility of additional information diminished (Hayo and Neuenkirch, 2016). For these reasons, limited rationality can also be assumed in communication. Jost (2017) asked whether monetary policy is too complex for the public. Although central banks have increased their engagement in the information and education of the wider public, he found that the average British person displays limited knowledge of central banking. At the same time, there are strong indications that satisfaction with the Bank of England's policies increases with a better understanding of monetary policy.
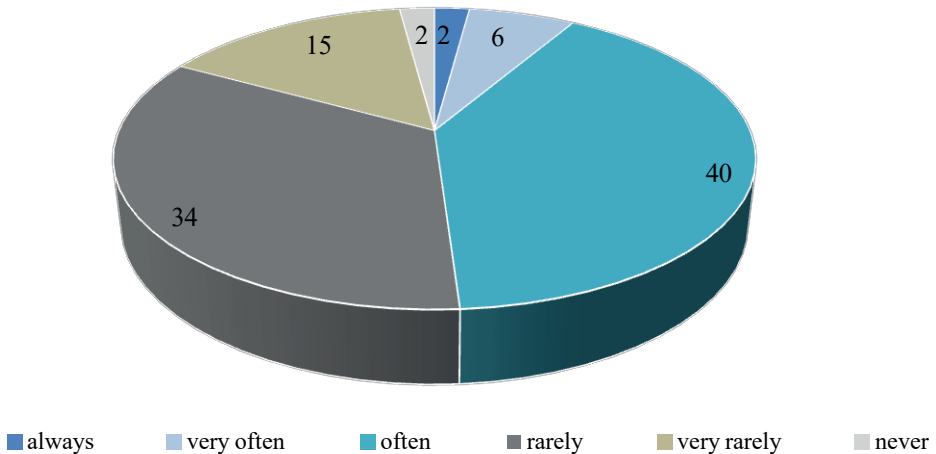

Fig. 7. Perceived Influence of the media as the percentage of the respondents feeling influenced by media in decision making

Source: own survey.

The authors' own survey asked how strong the influence of the chosen information channels is on the formation of one's own opinion. The perception of financial market players as to what extent they feel influenced by the media was split into two parts (see Figure 7): 49% often or always feel influenced, 51% rarely or not at all. In contrast, previous experiences play a clear role in the formation of opinions: 52% responded that they often feel influenced by previous experiences and a further 23% even very often or always. Only 25% confirmed that former experiences have little influence on current opinion formation.

3.3.4.   Information recall and action guidance

The task of the market participants is to separate the important information from the unmanageable multitude of information and to weight the sources of information. Two important aspects should be briefly mentioned here: firstly, the narrative character of the information, and secondly, the information distortions due to decision heuristics.

The *narrative character* of communication is often erroneously compared with the fictional character of stories, even though individual fictional elements may be present in the stories. This is always the case when statements are made about future financial trends or monetary policy decisions. Central bank information initially refers to the exchange of facts and also develops a plausible story, a narrative or some form of mental model, from the facts. For the recipient's guidance, the dividing line between factual and fictional statements is a central factor in better understanding the information content of the central bank's statements. The more knowledge the recipient can bring to the communication, the better this separation can be achieved. The more informed and knowledgeable the recipient is, the better he/she can classify the transparency, comprehensibility and credibility of the information. Knowledge on both sides can contribute to different strategies for optimizing communication. It is known from memory research that autobiographical memories are organised and represented in the form of such stories so that the spatial, temporal and thematic context is preserved (Greuel, 2001). When retrieving information, the thematic order, the plot and the personal allocation, i.e. everything that makes up narrative stories as part of the mental models, is of help.

Decision heuristics can be understood as mental rules that can serve as decision aids for individuals. Against the background that people have only limited temporal and cognitive resources at their disposal – as already mentioned in Section 3.3.3 – mostly unconscious decision rules developed to quickly guide action. However, these decision-making rules must be questioned in connection with financial market transactions. With all the complexity that results from the wide array of information available, one frequently occurring effect is surprising: the decisions of market participants sometimes correlate very strongly. The reason for such a correlating decision behaviour can be heuristics on the one hand, and the phenomenon of herd behaviour, on the other. This is another automatic decision-making mechanism

that leads to a high degree in selective perception, i.e. always in the sense of the other market participant, and can thus influence our communication behaviour. For example, Belhoula and Naoui (2011) found that two potential co-directional behaviours of investors, namely herding and positive feedback trading, seem to drive relatively large market price movement. Therefore, herding and feedback trading are the important factors to short-term price trends which can destabilize the stock markets by moving prices away from their fundamental values. Szyszka (2008, 2009, 2010) reported how investors' psychology changes the vision of financial markets, and discussed the consequences of the new view of finance by capital market practitioners-investors, and corporate policy makers, and concluded with some suggestions on the future development of the capital market theory in light of behavioural finance.

From the requirements for a common understanding of the narrative story and the attributes of heuristics on the recipient's side, a special claim can be established on the part of the sender of information. Any communication from the central bank must be based on a mental model of the communication effect itself and also of the intermediary's or market player's characteristics. The combination of mechanisms, processes and principles governing the central bank's communication policy can be seen as captured psychologically in the mental models. The effectiveness of communication in relation to the mental models seems determined by the salience of the terms of reference, the coherence of the underlying vision, values and norms and, importantly, the adequate interaction between the communication partners. Similar to public risk communication (see Morgan, Fischhoff, Bostrom, and Atman, 2002), effective communication is grounded in a deep understanding of the mental models of policy-makers and citizens or market participants. The process of understanding monetary policy communication can be thought of as a process by which one comes to know what market situations are truthfully described by the central bank's information as distributed in terms of what and how. A major way in which this might be done often seems to take the central bank's message directly or through an intermediary and construct a mental model of the situation described by the message, in a very similar way to constructing a model of a real object (e.g. 100-euro banknote) during perception. Mental models can be depicted as relatively persistent, personal or collective, but at the same time adjustable internal representations which in some form seem to reflect objects, situations and relationships in the outside world. In just a few words, mental models can be seen as a collection of internal cognitive tests in respect of images to describe the outside world (whether they are right or wrong) which are directly based on subjective experiences. Such models allow, consciously or unconsciously, to identify and evaluate relevant features and relationships in the economy and determine the meaning of economic circumstances (Dittrich, 2017; Smith, 2020). The recipients must also have the ability to construct any number of models of the described financial situation. The potential to construct alternative models of the many different situations described in monetary policy statements is

what enables receivers to grasp the meaning of a message and to establish its true value. The importance of how to correctly represent meaning becomes obvious if it is associated with expectations as one essential part of the individual's mental model of economic development.

Prior to communication, an assessment of the audience including the knowledge of the financial market players is made. That means a mental model for understanding or, in other words, the 'common ground' of understanding is established. It can be assumed that both sides will try to keep the costs or the effort of communication as low as possible. This already creates a dilemma; if the financial market players all try to minimise their communication costs and prefer their own interpretation, the probability of misunderstanding increases simultaneously. For this reason, the central bank cannot assume that it alone has an adequate mental model of communication available at all times.

This dilemma now leads to the central bank as the sender, not first and foremost focusing on the financial market players as an audience, but first of all presenting its own point of view as convincingly as possible. Only after observing the consequences for the financial markets will the central bank adjust its communications and make new statements accordingly. Thus, there will be a continuous exchange of information between the central bank and financial market players. The instrument of forward guidance is an attempt to break through this constant back-and-forth and to increase the security for financial development through communication.

The influence of decision heuristics on the processing and evaluation of information was pointed out in the previous section. Moreover, another equally important influence on decision-making can be seen in the role emotional responses play during the communication process. In many situations, decisions are shaped much more by emotional-driven, rather than our rational-driven, evaluation processes. The study's results show that gut feeling, namely a decision that cannot obviously be rationally justified, certainly plays an important role as indicated in Figure 8. More than 65% of those surveyed consider gut feeling/intuition to be important, and more than 90% have already made a decision based on their intuition.

Finally, the monetary policy communication by a central bank not only seems to depend strongly on the psychological constraints and cognitive heuristics of its recipients but evidence continues to mount that people do indeed use mental models, consciously or more often unconsciously, to reason and make predictions about the world around them (Smith, 2020). However, there remain a number of challenges to be able to situate the behavioural or mental model approach effectively within the financial domain. One initial challenge is to continue to improve methods of eliciting mental models about the economy, including the decision heuristics involved as initiated here. The suggested communication model encompassing the mental model construct can be used as a theoretical tool to better understand the central bank's monetary policy and how people think about, and thus interact, with financial systems. Correspondingly, this extended model can be viewed as a practical tool to
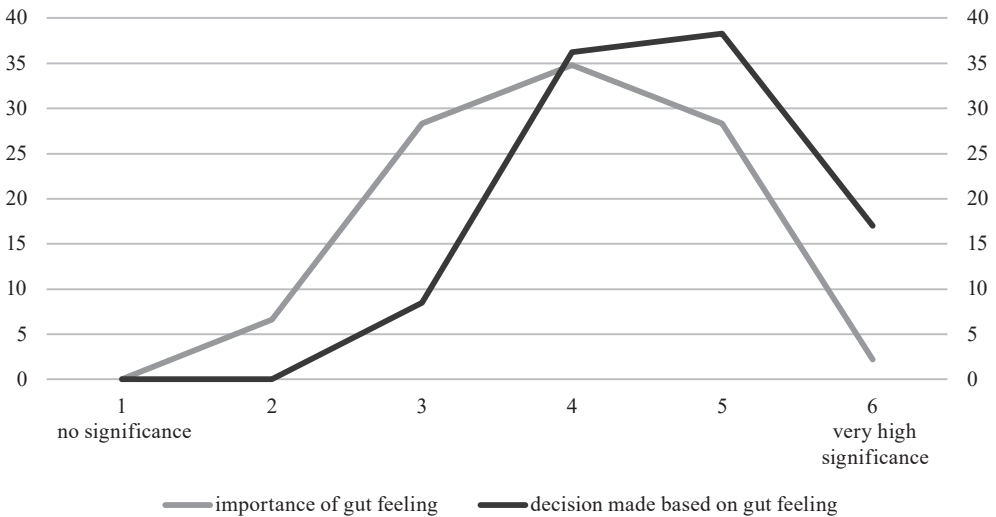
Fig. 8. Emotions in decision making as the percentage of the respondents referring to 'gut feeling'

Source: own survey.

support collective decision making and action, e.g. the central bank's policy strategy communication. Undoubtedly, further research on psychological constraints in monetary policy communication and on the relationships between individual and collective mental models is also required. For example, as soon as the understanding of the message communicated is established, its mental model seems remarkably resilient, particularly if mapped by the inculcation of shared understanding or invoked by psychological constraints, in which case inefficiencies in communication can be ignored or understated. One goal of the current communication and mental models approach is to identify the gaps and misconceptions of financial experts and market players and to try to alert central banks and, more generally, financial institutions by pointing out the what and how of the individual's information processing that will help market participants in formulating comprehensive and accurate mental models to guide their financial actions.

4. Conclusion

Managing market participants' expectations of future monetary policy is a key element in enhancing the efficiency of monetary policy. For the management of expectations to work effectively, however, numerous hurdles have to be overcome as the study's model of the communication process between the central bank and financial market players shows. First of all, the central bank must choose what information it wants to pass on; in the selection of information, it is caught between credibility, flexibility and clarity. Not only what, but also how much information, matters.

Yet there is no guarantee that the information sent will reach the recipient unaltered. In the case of indirect transmission, i.e. through an information intermediary such as the press or news services, the intermediary assumes a kind of filter function and selects information or, if necessary, enriches it with comments. Although the survey results showed that the direct communication channel to the central bank is frequently used, this information is complemented by information and comments from other sources – which also exert an influence on the opinion formation of the recipient.

The recipients themselves then play a major role in the information reception. Therefore, their capacity for absorbing information is limited and behavioural automatisms and decision heuristics are frequently activated. Hence, it is not only decisive what information is provided by the central bank, but also to what extent it reaches and is absorbed by the recipient. While in this article the authors focused primarily on professional financial market players from commercial banks and asset management companies, the general public is also a target group for central bank communication. It has been argued that credibility and trust are intrinsically intertwined and can be seen as essential framing components of the central bank's communication strategy. Framing is a known phenomenon and exemplifies the influence of a particular form or presentation style of the message on the decision--making of market participants (e.g. Baker and Nofsinger, 2010; Baker, Filbeck, and Nofsinger, 2019). With the general public as a heterogeneous group, the demands on communication and the possible obstacles are therefore even greater. It seems essential to understand the needs of the public and also the differences of the heterogeneous subgroups as far as successful communication is concerned. The crucial role of context, mainly the psychological one but also referring to the technological one, has been highlighted as well as the role of the mental models in order to develop convincing communication strategies. In this sense, successful communication does not only depend on the information to be transmitted but equally the information has to be conveyed in the right frame or context. There is a need for the theoretical underpinning and further research in this area. In particular, the human factor, e.g. human psychological constraints such as heuristics, bounded rationality and emotions, seems to play an essential role in the effectiveness and efficiency of monetary policy. Understanding the psychology of the recipient and applying a theory-driven model of communication will enable central banks to fully engage with market participants and develop a layered communication policy.

Acknowledgements

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