DISCUSSION NOTE

MONETARY POLICY DIVISION

N°5

Surveys on household and business expectations: How to use them and how they can contribute to central banking

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PREFACE

The Discussion Notes (DN) seek to examine issues that are relevant for monetary policy in Chile and the world. Their goal is to present a discussion regarding the current state of the literature, highlighting the most important implications for the design of monetary policy. For that purpose, the Notes describe the different approaches set forth by frontier research, highlighting the consensus as well as debates that are still open. The DN are elaborated by economists from the Monetary Policy Division and do not necessarily reflect the official position of the Board of the Central Bank of Chile.

The fifth NDD deals with how central banks can use information from household and business expectations surveys. Interest in economic expectations, from agents other than analysts or the financial sector, has progressively increased among the world's central banks, which in turn has sparked a growing debate among international specialists. This note delves into the theoretical aspects that underpin the use and review of these expectations, revisiting the debate that economic theory has established on the hypothesis of the deviation of rational expectations with complete information. At the same time, it reviews some of the main challenges when producing and analyzing this information, based on different international and local survey and collection experiences. It also illuminates the areas in which this type of information could strengthen the conduct of monetary policy, providing a roadmap for future research that would allow the potential use of this information to be harnessed. Finally, it reviews some background information on a study carried out by the Central Bank of Chile, which consisted of a survey applied to several central banks around the world, aimed at investigating the practices of production and use of this information.

This Discussion Note has been written, in alphabetical order, by Jorge Lorca, Ernesto Pastén and Daniel Perez. The authors thank feedback by Elias Albagli, Sofia Bauducco, Mariana Garcia as well as economists in the Monetary Policy Division at large.

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1. INTRODUCTION

On May 4, 2023, the Central Bank of Chile (BCCh) made public for the first time the results of its Survey of Price Determinants and Expectations (EDEP), which investigates the firms' inflation expectations. Thanks to this effort, the BCCh has measures of inflation expectations of other economic agents, beyond the traditional surveys to analysts and specialists of the financial sector, which allows it to enter a fertile field of study that has been addressed both by academics and in the main central banks of the world.

The purpose of this Discussion Note (DN) is to shed some light on the way in which these new indicators can provide relevant information both on the current position of the national economy and for the conduct of monetary policy. This, in a context where the interpretation and use of this information is still a matter of debate among international specialists.

Thus, based on both international academic literature and the experience already accumulated within the BCCh itself, we present four main sections where we compile the academic background that supports the importance of having measures of inflation expected by households and firms. In addition, we present the analysis that their study has brought about in other latitudes, to finally focus on the local agenda and on the initial results compiled by the BCCh.

Chapter 2, "Theoretical motivation", delves into the reasons why it is informative, from the standpoint of economic theory, to learn directly about the inflation expectations of consumers and firms. Broadly speaking, these reasons can be simplified into two main areas: first, theory suggests that it is these agents' expectations which determine the main aggregate economic variables, such as activity, employment, investment and inflation itself. Second, acknowledging these expectations provides empirical evidence for the discussion of deviations from the Rational Expectations Hypothesis,[1] with their resulting policy implications. This hypothesis posits that economic agents do not make systematic errors in forming their expectations and, even though its incorporation into modern economic analysis has allowed for great advances in the diagnosis and conduct of economic —and monetary policy in particular— it also has some limitations. For example, it does not allow for the incorporation of certain important phenomena, such as the mutual interaction between the evolution of the credibility of economic policy and its effectiveness, and its application generates some predictions that are considered unrealistic.

Chapter 2 also explains that the contribution of surveys is precisely to provide information about the type of deviations that are empirically relevant in the formation of inflation expectations.

Chapter 3 "Stylized micro facts: Implementation challenges" raises some questions for the design, implementation, and interpretation of the results of this type of surveys. The main difficulty lies in the fact that respondents may not be familiar with the concept of inflation or with the wording typically used in technical analysis. These difficulties result in a list of effects that include implicit biases in the responses, greater variance relative to measurements by more specialized respondents, answers being subordinated to personal experiences, and difficulties in obtaining answers for longer-term horizons.

[1] See Muth (1961); Lucas (1972); Sargent (1973).

None of these effects, however, invalidates the use of this type of instruments, as their use in several central banks around the world reveals, but they do raise the need to make the necessary adjustments when analyzing and interpreting their results. What's important is to bear in mind that these surveys are sources of information that complement —but do not replace— the expectations of experts (Economic Expectations Survey, EEE) and financial traders (Financial Traders Survey, EOF), as their importance lies in broadening the view to include the expectations of other agents.

Chapter 4, "Stylized macro facts: An agenda," focuses on analyzing the areas in which household and business inflation expectations surveys can contribute innovative elements to the conduct of monetary policy. As they are recently developed instruments both in Chile and abroad, the academic literature is yet to come up with conclusive answers to all the questions raised by their use. Therefore, this DN conjectures an agenda on this matter, which could serve as a starting point for incorporating these instruments into the Central Bank of Chil's usual framework of analysis.

The main areas considered are: Incorporating expectations in forecasts (international evidence suggests that they have predictive power); evaluating the sensitivity of expectations to new information (which would contribute to the interpretation of results that tend to be very volatile); quantifying the effects of changes in expectations on economic decisions (which would allow direct evidence of their impact and fine-tune conjunctural diagnoses); measuring the effect of monetary policy on expectations (to have a notion of credibility); and using them to assess the empirical consistency of the economic models used by central banks.

Finally, chapter 5 "Use of household and business expectations surveys by central banks" presents general results of an effort by the Central Bank of Chile to glean information on the use of inflation expectations surveys by other central banks. Although these results are preliminary and are part of a study currently underway, the main finding is that central banks make intensive use of this type of instruments, especially those that measure the firms' expectations.

2. THEORICAL MOTIVATION

In the new-Keynesian theory,[2] which serves as the conceptual underpinning for the inflation-targeting regime implemented by many central banks around the world, including the BCCh, household and business inflation expectations are a key element in determining the amplitude of aggregate fluctuations and central banks' capability of influencing inflation and economic activity.

Indeed, in this theory, aggregate fluctuations are originated by the interaction among households, which make consumption, savings and labor decisions on one hand, and firms, which make production, pricing and investment decisions on the other. According to this theory, the pass-through mechanism of monetary policy to inflation and activity is as follows: households change their decisions inasmuch as monetary policy affects the real interest rate they face.

Because the central bank modifies nominal interest rates, households must form their inflation expectations to derive the real interest rate relevant to their decisions. Therefore, the effect of monetary policy on their expectations will determine the extent to which a central bank will influence saving, consumption and labor supply.

As for firms, the effect of monetary policy on their inflation expectations will determine how much a central bank influences their pricing decisions, and therefore inflation. This affects profit margins and, given their own relevant real interest rate, determines the effect of monetary policy on investment.

The net effect on output, inflation and employment is determined jointly by the reaction of firms and households to monetary policy. Another way of looking at this mechanism is to do the hypothetical exercise of questioning what would happen if households' inflation expectations were to rise, holding everything else constant, including monetary policy. The real interest rate relevant to households would fall, so they would want to consume more and decrease their labor supply, leading to lower savings (or higher debt). The incentive to consume more would increase aggregate demand, while the lower labor supply would result in higher costs for firms, pushing up prices.

Therefore, expectations of higher inflation in the future by households means higher inflation today. If firms also expect higher inflation, the pass-through of higher labor costs to final prices is even stronger. Higher inflation today partly undoes households' incentives to consume more, but the net effect would be higher activity and higher inflation.

The above represents the most fundamental aspects of the relationship between monetary policy and inflation expectations; however, other elements can be introduced that will have additional effects. For example, it should be considered that the existence of frictions in the labor market could add persistence to inflation, since wages would respond slowly to changes in expectations. Financing restrictions to households and firms could also broaden the amplitude of cycles, since the availability of credit depends on the state of the economy and monetary policy.

In addition, the fact that part of consumption is in durable goods —and that the process of investment and input inventory accumulation in firms is costly— implies that activity could respond relatively

[2] See (Clarida *et al.* 1999; Woodford, 2003; Galí, 2008).

more strongly to increased expectations, because they would anticipate investments and purchases of durable goods and inputs in response to expected price hikes in the future. This does not consider the expected response of monetary policy, which could induce the opposite effect: the purchase of durable goods, investment and input inventories could contract in the face of expectations of higher future inflation, if this in turn implies expectations of a more contractionary monetary policy.

The Rational Expectations Hypothesis imposes theoretical discipline on the forming of expectations: it generates the implication that rational agents —despite possible mistakes— do not make systematic errors in their expectations, which are also determined in coherence with all the macroeconomic variables of the model considered. This hypothesis is the basis of the neo-Keynesian model.

Although the implications of this hypothesis are broad, a particularly important one is that which predicts that a monetary policy that systematically seeks to "sustain growth" will only lead to more inflation, with no effect on activity (Barro and Gordon, 1983). This conclusion is critical, because it sets the foundations that justify a monetary policy framework based on inflation targeting.

Naturally, reasonable doubts have been raised as to whether the Rational Expectations Hypothesis is fully satisfied empirically, so there is active academic literature that draws direct implications for monetary policy in the face of certain deviations away from this hypothesis. One example is that its fulfillment is subordinated to the level of confidence of households and firms regarding the central bank's commitment with its inflation target (King, Lu, and Pastén, 2016).

The credibility of a central bank is a variable that evolves over time, which implies that its monetary policy affects inflation expectations not only through of its direct effect on activity and inflation, but also because it signals the central bank's commitment to control inflation in any future contingency. This is why central banks seek to build and maintain their credibility, since in this way they can achieve the objective of keeping inflation under control at a lower social cost. The policy implication is that, in the face of an inflationary outbreak, the central bank must act decisively to safeguard its credibility and facilitate the control of inflation in the future. It also underlines the importance of measuring inflation expectations, as it allows monitoring its credibility over time.

As we mentioned, the Rational Expectations Hypothesis implicitly assumes that —on average— economic agents do not make prediction errors, both in the case of a particular individual in making decisions over time, and across different individuals at a given time.

However, different studies have introduced mechanisms where this does not hold. Lucas (1972, 1975) shows that, in a scenario in which firms do not observe monetary policy decisions perfectly, their prices respond to it only partially, which strengthens the central bank's power to influence activity and inflation.

Sims (2003) attempts to address a natural objection to Lucas's argument: that firms are indeed perfectly able to observe the central bank's decisions if they pay sufficient attention to all the relevant sources of information. Sims argues back that, even if this happens, firms do not fully factor the central bank's decisions into their prices, because of the cost involved in taking into account all the relevant data.

This represents a deviation from rationality because, by incorporating potentially different information, inflation expectations are not —on average— the same across all entities. Moreover, by not fully internalizing monetary policy decisions, systematic errors are made. Consequently, in addition to validating Lucas's conclusion, Sims shows that the persistence of certain business cycles may originate in the process of forming expectations and not in the persistence of exogenous shocks, as the basic neo-Keynesian theory assumes.

Other more recent examples are Angeletos and Lian (2018), and Gabaix (2020). The former show that, if there is dispersion in the indicators that households and firms use to form their expectations, a prediction of the neo-Keynesian theory considered artificial is eliminated: the effect today of a promised monetary policy action in the future is the greater the further into the future the promise is to be kept—the so-called forward guidance puzzle.

In turn, Gabaix (2020) posits that, if the volatility of expectations is inversely related to the prediction horizon they obey, the puzzle we are discussing is solved at the same time that it weakens the "Taylor Principle,"[3] which refers to the conditions that must be met in neo-Keynesian theory for the economy not to be trapped in a situation of high volatility with no apparent cause. This possibility is widely perceived as unrealistic, which is not to say that episodes of high volatility have never occurred, but that they can generally be associated with a direct cause. In the work of Gabaix (2020), high volatility without apparent cause can occur, but it is highly unlikely.

A constant in all these papers is that expectations are not directly informed by empirical evidence: instead, the papers assume a process of expectations formation that, according to the authors, has "reasonable" implications. This observation underscores the importance of having surveys of inflation expectations because they provide direct empirical evidence, and at the same time impose discipline on the discussion of conjectures about behavioral patterns in the formation of expectations.

[3] See Taylor (1992).

3. STYLIZED MICRO FACTS: IMPLEMENTATION CHALLENGES

This section addresses a series of stylized "micro" facts that group together empirical regularities found in the collection, implementation and interpretation of various expectations surveys, as well as patterns found in the responses. Specifically, the analysis focuses on the following dimensions: questionnaire design and construction, data collection, data processing, and analysis and dissemination of results. For the international literature, this section relies on the summary provided by Coibion et al. (2022) and, for the Chilean case, in Zapata et al. (2022) and Muñoz (2023)..

3.1 Questionnaire design and construction

Evidence obtained both in Chile and worldwide documents the existence of a series of challenges for the production of questionnaires that inquire into the inflation expectations of households and firms. Some of these challenges include: the complexity of the "inflation" concept in itself, the estimation problems in setting reference periods, the difficulty of answering continuous questions or the inability of the respondent to distinguish between inflation, general price level, and their daily purchasing experience.

In fact, cognitive tests conducted by the BCCh in preparation for the EDEP showed that, when presented with a question about their inflation expectations, respondents tend to answer "I am not familiar with the subject," "I don't have a crystal ball", "I'm not a fortune teller" or similar. However, after the interviewer insists, respondents tend to give a quantitative answer. This experience suggests that, when answering an inflation expectations survey, respondents feel that they must "guess" or "get the number right" of future inflation. However, the purpose of the question is not to assess the respondent's predictive ability, but to extract information about the inflation expectations implicit in their decision-making.

Another implementation difficulty arises when asked about inflation expectations over a long time horizon. It is the more difficult for respondents to answer the longer the horizon, even when the question is for two or five years in the future. It should be noted that this is not the case with market specialists. In the Survey of Economic Expectations conducted by the BCCh, analysts do not shy away from quantitative questions or longer-term horizons.

However, this does not invalidate questions about expectations to "non-expert" individuals, but rather suggests that both the survey and its analysis would benefit from using adjustment and adaptation processes that are pertinent to the type of survey respondent. This is not without technical challenges. For example, it is important not to confuse the respondent with a question that provides information to "guide" them, bias their answers or even generate resistance if they feel that the information provided does not reflect their personal experience. On the other hand, a more elaborate phrasing of a question to make it more precise may have the opposite effect by increasing its cognitive burden. In general, it is recommended to ask in percentages, or to provide ranges for the answers; there are also alternatives that inquire about the probability of occurrence of different inflationary scenarios, although with a significantly heavier cognitive burden than the other forms.

3.2 Collecting information

Since the aim of these surveys is to extract the inflation expectations implicit in the decision making of households and firms, access to the person making the decision within them is required. This can be difficult considering that these individuals may not be accessible, and even decisions of interest to a central bank may be decentralized within a household or firm. Moreover, even in those cases where the target respondent may be willing to answer the questionnaire, it may be difficult to collect the information because of access barriers, a situation known as the "gatekeeper effect."

The implication of the difficulties in recruiting high-level respondents within firms results in a possible low response rate, making the survey unrepresentative and affecting its statistical quality. However, using different techniques to recruit and retain respondents can help mitigate this problem.

3.3 Data processing

All things considered, the existence of high dispersion in the responses is a phenomenon documented in both Chilean and international evidence. In fact, the existence of outliers is common in this type of survey.

These outliers can contaminate the interpretation of the results by affecting averages or other measures of central tendency. There is currently no standard for the treatment of outliers in surveys of household and business inflation expectations. As described in section 5 of this Note, preliminary results of a survey applied to different central banks around the world reveal at least three strategies to treat outliers. The first strategy applies some statistical treatment based on the distribution of the data itself.[4] The second one applies normative, non-statistical criteria. For example, deleting responses that exceed the central bank's target or actual inflation for that month by a defined number of times. While this alternative anchors the results to orders of magnitude more similar to actual inflation, it may bias the type of response delivered by the respondent if these criteria are too restrictive. A third alternative derives from a combination of the previous two, where a lax normative criterion can be established, and within it, some statistical treatment can be applied.

3.4 Analysis of the results

The process of interpreting results must take into consideration all the challenges outlined above. In addition, it should consider that those associated with the analysis of these expectations are closely linked to the type of answers provided by the respondents.

For example, the positive bias in the expectations of households and businesses in relation to the results obtained from surveys directed at specialists, is a fact that is observed both in Chile and in international surveys of a similar nature (Coibion et al., 2022). This limits the possibilities of defining a priori an anchor level for their inflation expectations. This could only be done based on the empirical evidence of their series and will not necessarily have the central bank's inflation target as their reference.

[4]/ Some examples are percentile-based methodologies, interquartile ranges or Chebyshev's theorem. These are all statistically robust, although they imply that the treatment may not be consistent over time in different surveys.

This is the reason behind the suggestion to analyze the movement of the series of expectations over time, examining their trends rather than point estimates of their levels. At the same time, the analysis of measures of central tendency should be complemented with other indicators. The consideration of dispersion measures, such as the structure of percentiles, standard deviations or histograms, will provide more information for the analysis.

3.5 Result dissemination

The data dissemination stage is critical to ensure that the information collected, analyzed and validated effectively reaches stakeholders. The uniqueness of household and business inflation expectations, coupled with the difficulties of collection and analysis, requires a planned dissemination strategy to ensure accurate interpretation and avoid potential confusion.

One illustrative example lies in the potentially erroneous inference that measures of expected inflation by households or firms that exceed the central bank's target imply a de-anchoring of inflation expectations by these agents.

4. STYLIZED MACRO FACTS: AN AGENDA

This section emphasizes the aspects of the literature for which the direct collection of information on inflation expectations has a use for monetary policy design and implementation.

Although our focus is on households and firms, a comparison is also made with expectations of experts and financial traders, when possible. This is so because, although the conceptual framework of monetary policy suggests that it is the expectations of households and firms that are informative; historically, information has been gathered from specialists linked to the financial sector. Therefore, the latter are better known and more integrated into the central banks' decision-making process.

This latter point is also systematically addressed in section 5, which presents preliminary results of a survey conducted by the BCCh to other central banks, with the aim of identifying the characteristics of the household and business expectations surveys available to them, and how they are use.

The literature review identifies five important aspects regarding the use of inflation expectations surveys for monetary policy conduct, namely (1) the predictive power of different measures of expectations, (2) the influence of marginal data on expectations, (3) the influence of monetary policy on expectations, (4) the effects of expectations on decision making, and (5) the coherence between inflation expectations and the discipline imposed by a macro model. Below we examine these aspects and provide a research recommendation using data collected in Chile.

4.1 The predictive power of expectations

The discussion about the predictive power of inflation —whether from financial market variables, macro variables or surveys— dates back at least a couple of decades. The evidence presented by Ang et al. (2007) shows a certain advantage of surveys in the case of the United States.

With the more recent presence of direct measurements of expectations through surveys across different types of agents, it is possible to compare the forecast errors of households, firms, or professionals with respect to actual inflation at different horizons. A summary of recent evidence for the U.S. is presented by Verbrugge and Zaman (2021), who conclude that the inflation expectations of experts and firms tend to be more accurate than those of households, which is more evident in the case of core inflation. For one-year-out inflation expectations in the U.S., the table below shows the prediction error of different measures as a fraction of the prediction error of households: during the last decade, households' prediction error tripled that of firms over said horizon.

TABLE 1 PREDICTION ERROR AS A PERCENT OF HOUSEHOLD ACCURACY (2012-2021)

	Financial markets (Cleveland Fed)	Professionals (BlueChip)	Firms (Atlanta Fed)
CPI	60.0	58.1	55.6
Core CPI	9.8	33.3	31.4

Source: Verbrugge y Zaman (2021).

4.2 Influence of marginal data on expectations

A common query in the analysis of inflation expectations lies in the potential impact that a significant surprise in inflation induces on the current and future level of inflation expectations. The importance of identifying this sensitivity lies in its relation to the credibility of monetary policy and the anchoring of inflation expectations, especially at longer horizons.

Although the relevant evidence is scarce, in the three pre-pandemic years in the U.S. the presence of a positive correlation between one- and five-year inflation expectations across different types of agents has been established (Weber et al., 2022). This evidence calls into question the supposed indifference of long-term inflation expectations to short-term surprises.

There are also studies that show that prices of particular items in the CPI basket, such as gasoline, alcohol, dairy products or bread, have an important impact on households' inflation expectations (D'Acunto et al., 2021). Similar evidence also exists for some inputs and their effects on firms' expectations (Albagli, Grigoli, and Luttini, 2023).

Again, this suggests that inflation surprises have a certain multiplier effect on longer-term expectations. However, it is emphasized that a thorough analysis requires identifying this effect through an exogenous change in expectations at a certain point in time to assess its effects on longer-term expectations. This is not generally available, so all existing evidence can only be taken as suggestions.

4.3 Influence of monetary policy on expectations

Another question for central banks deals with the quantitative effects that monetary policy has on the inflation expectations of households and firms. This empirical question is particularly relevant, especially in contingencies such as the current one, where central banks are debating about the appropriate moment to withdraw monetary tightening after the inflationary period that began in 2021.

In this dimension, evidence is also scarce, although there are some approximations in related areas. For example, it has been documented that household and business inflation expectations did not react to the Federal Reserve's announcement of its new strategy of targeting "average inflation" (Coibion et al., 2023).

Outside of monetary policy, particularly in the fiscal domain, there is evidence that while households tend to distinguish between transitory and permanent changes in fiscal debt and expenditure indicators, the inflation expectations of younger and less educated segments of the population tend to be rather indifferent to changes in the fiscal scenario (Coibion, Gorodnichenko, and Weber, 2021). However, this is a far departure from the documented broad reaction of inflation expectations to tax changes (D'Acunto et al., 2021; Bachmann et al., 2021).

All in all, apart from the path already traced by the literature in terms of using randomized controlled trials in surveys to identify exogenous variations in information and consequent effects on decisions, the direct construction of measures of monetary policy surprises, as in Aruoba et al. (2021), is a promising analytical venue to identify the effects of monetary policy on such expectations.

4.4 Effects of expectations on decision making

This channel is difficult to diagnose because it requires identifying an exogenous change in expectations and the consequent observation of decisions on the part of agents. In fact, published studies show different results that seem contradictory to each other or to what is usually expected when inflation expectations change.

At the correlations level, there have been studies showing dissimilar results on the impact of expectations on consumption decisions. However, endogeneity and selection bias in these studies limit the interpretation of the results. Moreover, recent works have used randomized controlled treatments, where information is given to a group of respondents (making up the "treated" group) and then hypothetical questions are asked.

Using this approach, D'Acunto, Hoang, and Weber (2022) document that, in Finland, households tend to react to information of a VAT increase by bringing forward purchases. However, for the U.S. the evidence (Coibion, Gorodnichenko, and Weber, 2021) is different: information of higher future inflation decreases the propensity of households to bring forward consumption. This evidence allows us to make the following conjecture: higher inflation forecast by households and firms may imply worse economic prospects for them, which discourages current consumption. Along the same lines, the evidence surveyed by Weber et al. (2022) shows that, in New Zealand and Italy, higher inflation expectations of firms imply a decrease in investment and hiring, while only in Italy do they raise their prices more.

4.5 Coherence between inflation expectations and a macro model discipline

Once again, there is scant information available on this aspect, as this brings up the aforementioned requirement of exogenous change in expectations. Despite being a very relevant topic, this lack of information originates in the fact that expectations surveys to households and firms have become available only recently. One exception is the work of Carvalho and Nechio (2014), where inflation expectations are only just consistent with a macro model in recessionary periods. Finally, recent research by Ascari (2023) shows that exogenous changes in inflation expectations have contractionary and inflationary effects in a macro model where firm dynamics and the presence of aggregate uncertainty are key to generating the aforementioned effects.

5. USE OF EXPECTATIONS SURVEYS TO HOUSEHOLDS AND FIRMS BY CENTRAL BANKS

In recent years, central banks have shown increasing interest in conducting and analyzing surveys on household and business inflation expectations. However, there is little evidence in the literature on how they internally construct and use the data collected.

The Central Bank of Chile designed and implemented a survey addressed to different central banks worldwide in order to gather information on methodological aspects and practices in the processing of information. Also, to inquire about the use they give to this information in economic analysis, monetary policy decision making and research.

The data presented below are part of this study, which considers the answers of 28 central banks. The final results of the study will be published shortly in a BCCh working paper.

5.1 Main results

The questionnaire sent to the different central banks explores various topics and dimensions of surveys on inflation expectations. This inquiry is carried out through four modules: (i) types of surveys; (ii) sample designs and collection methods; (iii) questionnaire and data processing; and (iv) uses of the survey. The main results of the last module, i.e., those related to the use that central banks make of this information, are summarized below.

From the standpoint of access to these sources of information, there is a greater tendency among the central banks surveyed to use business surveys more than household or consumer surveys. Figure 1 shows that, while 21% of the central banks that answered the survey do not have access to household or consumer expectations, 14% do not have access to business expectations.

This trend towards greater use of surveys of business expectations is also more clearly expressed in the degree of participation of central banks in the process of statistical production of this information. While 64% of the banks surveyed directly conduct surveys of business expectations, only 17% do so for households or consumers[5].

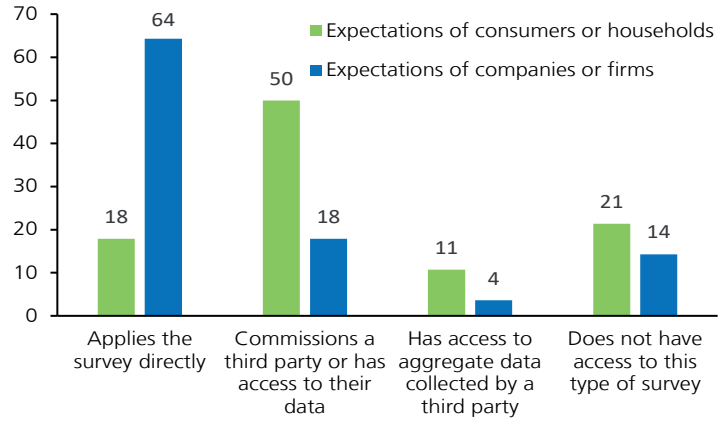
From the standpoint of the use the central banks assign to this information, the survey inquires about the relevance of inflation expectations for the performance of different activities, especially those related to economic monitoring, monetary policy making, and the development of an analysis and research agenda.

Figure 2 summarizes the main results. Central banks attribute high importance to household or consumer and business inflation expectations data. Among them, business expectations are more intensely used, which is true across all the different uses of expectations.

[5] For a better interpretation of the results, all the following figures have as their universe those central banks that have access to one or more of these surveys.

FIGURE 1 ACCESS TO INFLATION EXPECTATIONS DATA

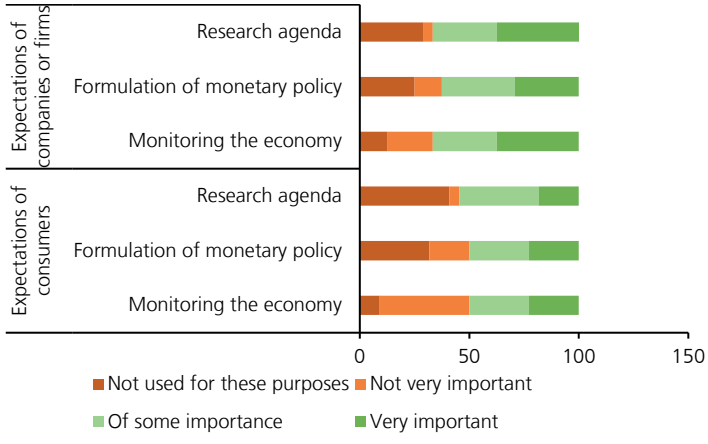
Does the central bank where you work apply surveys directly to learn about the inflation expectations of firms or consumers?



Source: Central Bank of Chile.

FIGURE 2 RELEVANCE OF INFLATION EXPECTATIONS DATA FOR CENTRAL BANKING ACTIVITIES

How relevant are expectations for central banks' activities?



Source: Central Bank of Chile.

Regarding the use of surveys, for both types of agents, economic monitoring and monetary policy making appear as the most intensively used activities. The use of this information to generate a research agenda is lower than the other uses considered, although most central banks also use it for these purposes. Actually, while more than 70% of central banks use business expectations for research, almost 60% do so with consumer expectations.

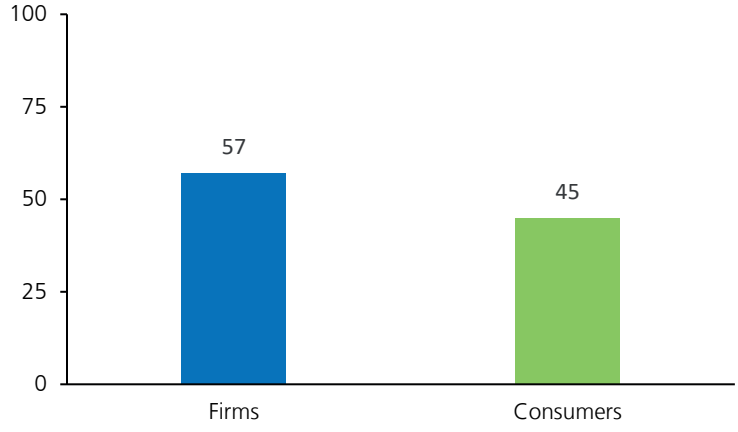
Finally, a high proportion of the central banks surveyed consider this information to be very important, and in fact "critical"[6] for carrying out these activities.

Figure 3 shows that 57% of the central banks surveyed use the firms' inflation expectations to do their forecasting exercises, while 45% use household or consumer inflation expectations. Figure 4 shows that most of the central banks surveyed use business and, to a lesser extent, household or consumer inflation expectations surveys as input for formulating assumptions and judgments.

Regarding the use of this information to feed projection models, figure 4 shows that around half of the central banks surveyed report using these surveys as input to feed their central quantitative models (called "core"), while a somewhat smaller proportion use them for their satellite models.

FIGURE 3 USE OF INFLATION EXPECTATIONS IN FORECASTING EXERCISES

Do you input inflation expectations into your projections?

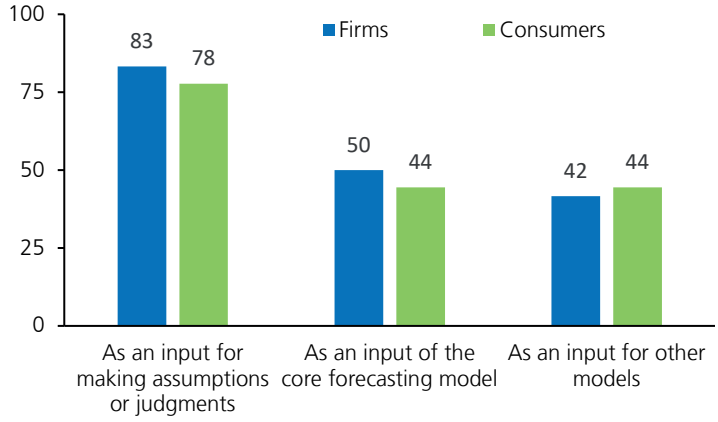


Source: Central Bank of Chile.

[6]/ It appears thus in the response category of the survey, which, for design reasons, is not depicted in figure 2.

FIGURE 4 FORECASTING EXERCISES WITH INFLATION EXPECTATIONS DATA

How are inflation expectations used in your forecasts?

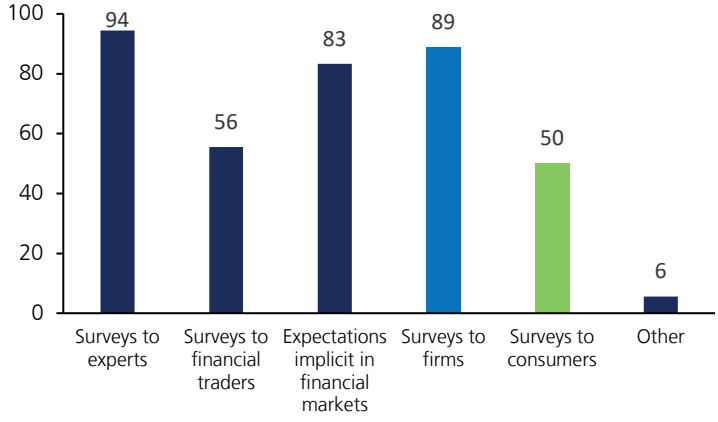


Source: Central Bank of Chile.

Figure 5 summarizes the responses on the sources used by central banks to determine the anchoring of inflation expectations: most of them use experts' expectations, closely followed by those coming from businesses and financial asset prices. Household or consumer inflation expectations are the least used for these purposes, which may be linked to the relative scarcity of instruments that collect this information or greater month-to-month volatility. It should be noted that this figure considers as the universe the central banks that conduct one or more of these surveys and have reported using them in their monetary policymaking processes.

FIGURE 5 SOURCES TO DETERMINE THE ANCHORING OF INFLATION EXPECTATIONS

What sources of information du you use to asses anchoring/de-anchoring of inflation expectations?



Source: Central Bank of Chile.

6. CONCLUSIONS

This Discussion Note draws on the international literature, the experience of other central banks and the Central Bank of Chile's own experience to address different aspects in which household (or consumer) and business inflation expectations surveys are informative for monitoring the economy, progressing in the understanding of how the economy works, and in the conduct of monetary policy.

In conclusion, the main value of these instruments is that they make it possible to monitor household and business inflation expectations, for which there were no direct measurements until now. However, the results should be analyzed and interpreted while taking into account the implementation challenges they face and are complementary to measurements of inflation expectations by economic experts and financial traders. This information is of great value for enriching the analysis of central banks in several dimensions, as the use of this type of survey by other central banks demonstrates.

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