

CHILE – Inflation expectations: Lessons from surveys and swaps

- ▶ Our analysis suggests that professional forecasters outperform market-based inflation expectations at the one-year horizon, on average, since 2012 and with the exception of the inflationary shock of 2021-2023. Not surprisingly, both measures performed poorly in the context of the post-pandemic inflationary shock.
- ▶ More recently, one-year ahead market-based inflation expectations have increased from roughly 2% to about 3.3%, while surveys have remained essentially unchanged at 3%. While these large swings likely reflect shifting expectations on Chile's inflation outlook, they should be viewed in the light of the results of this note, as surveys have on average been a better proxy at estimating inflation at the one-year horizon.

Why do inflation expectations matter?

Inflation expectations play a fundamental role in inflation targeting regimes, such as in Chile. In a nutshell, decisions on prices – including wages – reflect, among other factors, expectations on prices in the future, and hence the importance of maintaining inflation expectations anchored at the central bank's respective target.

Inflation expectations are usually measured through household and business surveys, professional forecasts, and market-based instruments. In Chile, the Central Bank began surveying businesses inflation expectations, among many other factors, monthly with data recollected since the end of 2021¹. Separately, the BCCh has surveyed economists (EEE, in Spanish) and traders (EOF, in Spanish) since 2000 and the end of 2009 respectively. Finally, several financial instruments in Chile can be used to obtain a market-implied inflation estimate at different horizons.

Indeed, the literature suggests that these instruments have certain limitations, and should be interpreted in their light. Market-based inflation estimates are well known to contain liquidity or risk premia, which also vary over time². On the other hand, surveys may be biased, informationally inefficient, have forecast smoothing, as well as reputational concerns that induce forecasters to trade-off expected accuracy with stability and credibility³

A contest between surveys and swaps

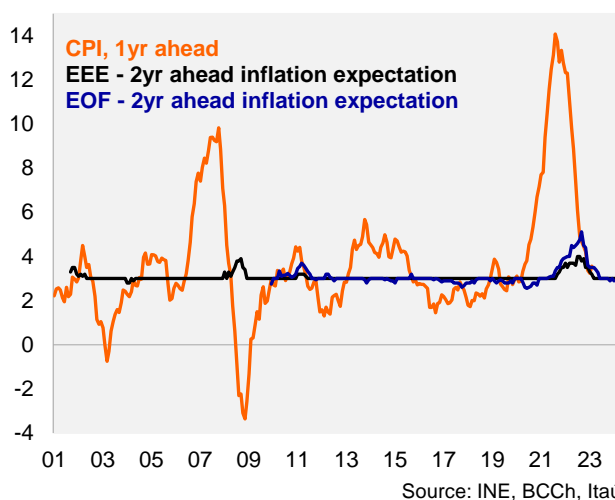
We are interested in assessing the performance of survey and market-based inflation expectations at the one-year horizon in Chile. One may be inclined to ask, why evaluate one-year rather than two, considering that the BCCh's inflation target is set at two years. First, survey-based two-year inflation expectations barely move in Chile, as can be seen in the chart below, reflecting the BCCh's credibility. Second, inflation expectations at the one-year horizon tend to fluctuate more and are also relevant for the conduct of monetary policy.

¹ The BCCh referred to this survey as the "Survey of Price Determinants and Expectations" or (EDEP in Spanish). More detail can be found in the annex.

² For Chile we can name the work of Beyzaga and Ceballos (2017), while the BCCh IPoM of March 2022 presents a good summary of the latest behavior of market estimates for inflation.

³ The work of (Diercks, et. al., 2023) presents a good summary of the latest findings in the problems and gaps around survey-based inflation expectations.

Two-year expectations broadly stable



As a survey measure, we resort to the BCCh's Analyst survey (EEE), available for a longer time span (since 2001) relative to the Traders' survey (EOF, since late 2009), and has had a more consistent methodology across the years. The BCCh monthly publishes (between the 10-13th of every month) the EEE survey containing expectations on inflation, the policy rate, rates, and activity indicators at different time horizons. To be precise, we resort to the EEE's one-year ahead median inflation expectation.

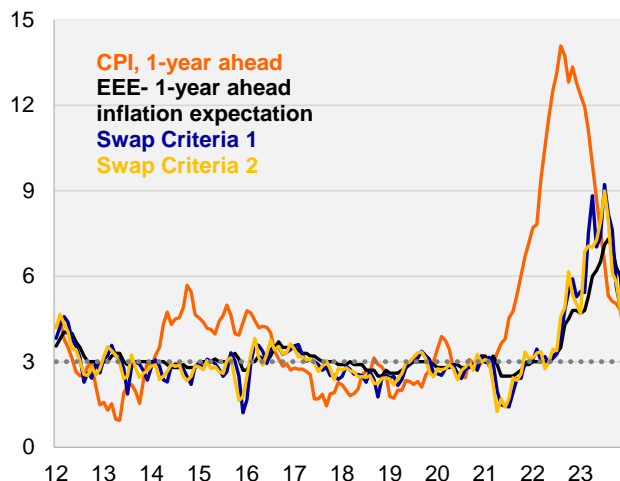
As a market-based inflation expectation, we refer to the one-year breakeven⁴ swap, published daily by the BCCh since late 2002. To make the measure comparable to the EEE, we take the average three days prior and after the EEE data is collected, and label it as "Swap criteria 1".

Separately, to assess if one-year breakevens perform better than the EEE with a few weeks of additional information, that is, immediately prior to the publication of the next CPI print, we build a second series labeled "Swap criteria 2" with the daily average of the week prior to the publication of the month's CPI.

As can be seen in the chart below, our one-year ahead inflation expectation measures tend to fluctuate close to the BCCh's two-year 3% target, with the notable exception of the post-pandemic period, when they drifted significantly higher. Market-based inflation expectations are more volatile than surveys, however there is not a material difference between the volatility of swap measures (see Table 1 in the Appendix).

⁴ Compensación inflacionaria swap promedio cámara, spot

Missing the inflationary shock



Source: INE, BCCh, Itaú

Survey estimates have had, on average, a better forecasting performance, except for the 2021-2023 inflationary cycle.

As can be seen in Table 1, for the 2012-2020 period, the EEE has a lower mean-squared error than the swap criteria 1 measure, that is statistically significant (according to the Diebold-Mariano Test, Table 2 in the Appendix). It should be of no surprise that all measures performed poorly in forecasting inflation one-year ahead in the context of the post-pandemic recovery. However, in this context, swaps performed somewhat better than the EEE for the inflationary cycle of 2021-23. Our DM test shows that there is not a statistically significant difference between the forecasting performance of the swap measures, so we cannot statistically assure that swaps perform better one-year ahead by gathering slightly more information.

TABLE 1

Sample:	2012-2020	2021-2023	2012-2023
One-Year Expectations	Without 21-23 Inflation cycle	21-23 Inflation cycle	Full Sample
Mean Squared Error			
Analyst Survey	1.229	29.067	8.188
Swaps Criteria 1	1.420	26.587	7.712
Swaps Criteria 2	1.347	25.780	7.455
Optimal Weight	1.213	26.373	7.503

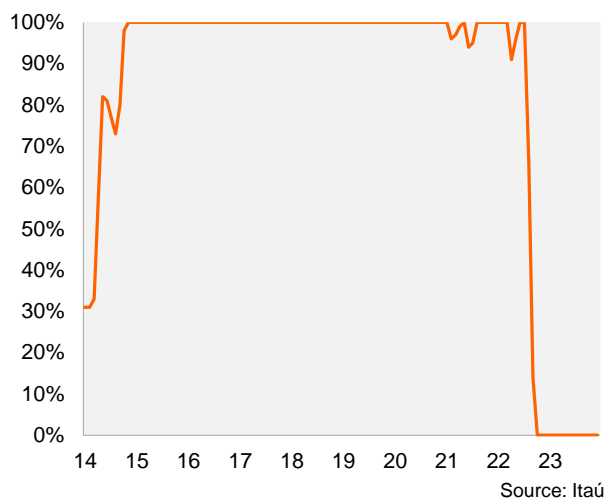
So ... which measure of inflation expectations should we use?

Calculating time-varying optimal weights. We calculated optimal time-varying weights for the EEE and our Swap criteria 1 measure, as a result of the minimization of the mean squared error using an expanding and a 54-month rolling window of forecasting errors⁵. As seen in Table 1, the optimal weight measures achieved lower mean absolute error and mean squared error, both in the complete sample and in the sample without the 2021-23 inflationary cycle. Table 3 in the annex shows that the lower forecasting error of our optimal measure is statistically significant, by employing DM tests for the full sample versus EEE and Swap criteria 1. Chart below shows the optimal evolution of the weights across time, where the EEE received a full weight estimation in periods with an absence of an inflationary shock, and this weight decreases in the 2021-23 inflationary cycle and around 2014 (avg. inflation in 2014 was 4.4%).

⁵ To calculate this measure, we took a grid of possible weights on the swap versus the survey. For example, if we suppose the weight is alpha, we set a weight of alpha on the swap and (1 - alpha) on the survey, where we let alpha take the values of 0 to 1 in increments of .01. Then, we compute the weighted version of the inflation expectation for each of these alphas and compare it to the realized values of inflation to obtain the absolute forecast errors. Finally, we look at all the forecast errors and get the lowest mean squared error up to that point in time.

This result is interesting in the sense that assigning a clear weighting strategy can lead to even better forecasts, and thus, provide a clearer signal on expectations of future inflation.

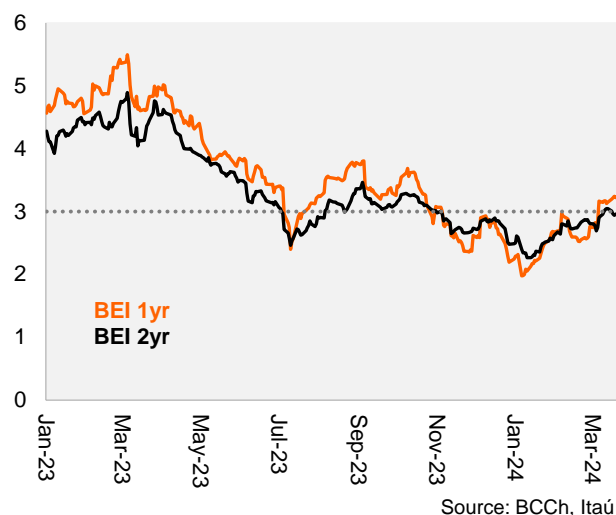
Survey optimal weight



Signal vs. Noise... What does this mean going forward?

More recently, medium-term market-based inflation expectations have increased, while surveys have remained essentially unchanged at 3%. To be precise, as can be seen in the chart below, one-year breakevens have increased from roughly 2% to about 3.3% in mid-March. While these large swings likely reflect shifting expectations on Chile's inflation outlook due to the large upside CPI surprises at the start of the year, and the effects of the intense and persistent currency depreciation, they should be viewed in the light of the results of this note. Except for the 2021-2023 inflationary cycle, survey estimates have, on average, been a better proxy at estimating inflation at the one-year horizon since 2012.

Breakeven inflation has been rising



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Annex 1

TABLE 2

Sample:	2012-2020	2021-2023	2012-2023
One-Year Expectations	Without 21-23 Inflation cycle	21-23 Inflation cycle	Full Sample
Mean & Standard deviation*			
Analyst Survey	3,03 (0,3)	4,13 (1,54)	3,31 (0,93)
Swaps Criteria 1	2,88 (0,51)	4,38 (2,19)	3,25 (1,34)
Swaps Criteria 2	2,88 (0,48)	4,32 (2,07)	3,24 (1,27)

*standard deviation in parenthesis.

TABLE 3

Sample:	2012-2020	2021-2023
Test Diebold-Mariano	Without 21-23 Inflation cycle	21-23 Inflation cycle
p-value		
EEE vs Swaps Criteria 1	0.075	0.031
Swaps Criteria 1 vs Swaps Criteria 2	-	0.377
EEE vs Swaps Criteria 2	0.182	

TABLE 4

Sample:	2012-2023
Test Diebold-Mariano	Full Sample
p-value	
Optimal vs EEE	0.013
Optimal vs Swap Criteria 1	0.056

Annex 2:

Chilean inflation expectations measures.

In Chile there are two main surveys for inflation expectations: Analyst (EEE) and Trader (EOF) survey, both published by the Central Bank, where the main differences between them consists in its respondents and the timing of their realizations. The EEE is a monthly survey of a group of academics, consultants and executives or advisors of financial institutions, which provides information on expectations of different macroeconomic variables. It is published between the 10th and 13th of each month. On another hand, the EOF is aimed at financial decision makers representing the different industries of the local financial market and foreign entities that actively operate with Chile. Since 2018, it is published before and after each monetary policy decision. In this sense, since the EEE has a more stable recollection period over time, and a longer series of data, we use it as our survey-based inflation variable.

Separately, Chile has a developed inflation compensation, or swap market, resulting from the direct transactions between different market actors. In this sense, for our inflation swap measure, we obtain our data from the Central Bank statistics of one-year inflation compensation *Call Money Swaps average, spot (%)*.

Likewise, in May of 2023, the BCCh presented a new survey that collects information on roughly 450 firms regarding cost and pricing dynamics, as well as inflation expectations at the 1-2yr horizon. The survey is called "Survey of Price Determinants and Expectations" or (EDEP in Spanish). The EDEP survey, published on a monthly basis, has data since November-21, and complements the Analyst (EEE) and Traders (EOF) survey. Data from the EDEP survey have showed that inflation expectations at the 1 and 2yr horizons are well above the analyst and trader surveys, however, this result was expected according to common upward bias of this type of surveys in line with the recent literature.

References

Beyzaga, C. and Ceballos, L. (2017) "Compensación inflacionaria y premios por riesgo: evidencia para Chile," Notas de Investigación, Economía chilena, vol. 20, no. 2, Banco Central de Chile.

Recuadro "Expectativas de inflación en hogares y empresas". Informe de Política Monetaria Marzo 2022. Banco Central de Chile.

Recuadro "Evolución reciente de las expectativas de inflación". Informe de Política Monetaria Marzo 2022. Banco Central de Chile.

Diercks, A., Campbell, C., Sharpe, S., Soques, D. (2023) "The Swaps Strike Back: Evaluating Expectations of One-Year Inflation," Finance and Economics Discussion Series 2023-061. Washington: Board of Governors of the Federal Reserve System.

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