



RESEARCH HIGHLIGHTS

Review of the current research conducted at the Central Bank of Chile

December 2020

This issue of Research Highlights reviews the following subjects that have been recently analyzed at the Central Bank of Chile (CBC):

- **Twitter-Based Economic Policy Uncertainty Index for Chile**
- **Surveying the Survey: What Can We Learn about the Effects of Monetary Policy on Inflation Expectations?**
- **The Impact of the Covid Public Policies on the Chilean Households**

Twitter-Based Economic Policy Uncertainty Index for Chile

Since October 2019, Chile has endured the economic effects relating to the social conflicts, aggravated by the ensuing Covid-19 pandemic. It is no surprise that these shocks to the real economy have intensified the economic and political uncertainty and are thus transmitted to the local financial markets. The Working Paper “Twitter-Based Economic Policy Uncertainty Index for Chile” ([Working paper of the Central Bank of Chile N° 883, July 2020](#)), by Central Bank of Chile (CBCh) economists Juan Sebastián Becerra and Andrés Sagner proposes an index to gauge general uncertainty in the Chilean economy. What is the level of economic and political uncertainty in Chile? Does a situation of high widespread uncertainty pose a risk to Financial Stability? What is the effect of general uncertainty on the prices of financial assets?

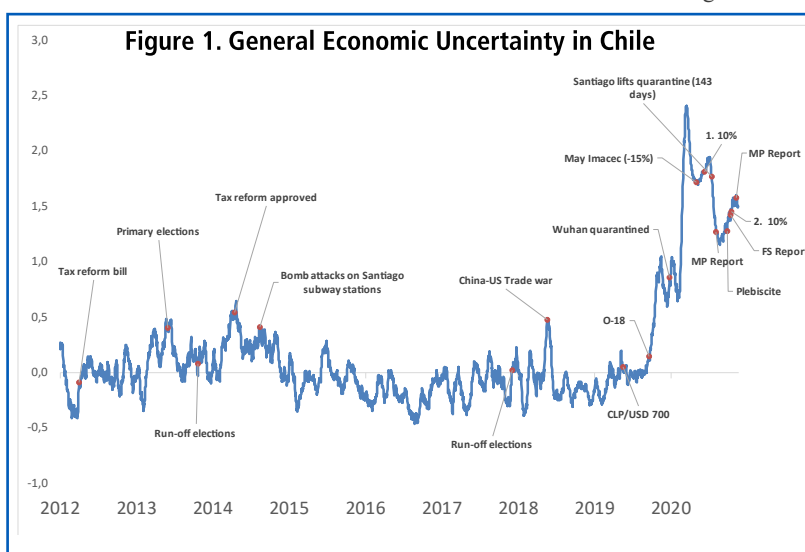
These questions, along with many others, arise naturally in a context such as the current one. In an attempt to answer them, the authors propose a general index of economic perception and uncertainty based on the methodology of Baker et al. (2016). Unlike this work, this study uses a non-traditional database from Twitter, which allows for real-time monitoring. The methodology considers 15 official Twitter accounts of the main news broadcasts, radio stations and newspapers in Chile which, since their creation, have 25.7 million followers and have published a total of 6.1 million tweets, which is the equivalent of activity per account of just over 105 daily publications on average. Then, the informational content of the tweets published

The social conjuncture that has unfolded in Chile since October 18, 2019 and the sanitary crisis caused by Covid-19 during 2020 have motivated the creation of a general economic uncertainty index to serve as a useful input in real-time monitoring tasks. To this end, the authors use a methodology that exploits messages found on Twitter.

daily by these accounts from 2012 onwards is compiled. In general terms, between 2012 and 2017, the number of annual tweets analyzed remained relatively constant at around 160,000. During 2018 and 2019, the number of annual observations was close to 200,000, and in 2020 to date, the number has exceeded 380,000 tweets.

Using this database, the so-called DEPUC Aggregate Uncertainty Index is constructed by calculating the

daily frequency of tweets containing predefined words in a dictionary of terms related to the general economy, economic policies (i.e., fiscal, monetary and commercial), uncertainty, or current conjuncture. The daily time series obtained is standardized using the mean and standard deviation of the period 2012 to 2019. Thus, the magnitude of the DEPUC is expressed in terms of standard deviations, and the positive (negative) values are representative of periods with a higher (lower) level of general economic uncertainty, with respect to the aforementioned period



Moving 30-day mean. Gray areas show periods of social protests and Covid-19 pandemic. Source: <https://sebabecerra.github.io/depu/>.

Intuitively, a rise in the DEPUC indicates a higher frequency of coverage of words that would reflect a greater degree of uncertainty regarding the reach, implications, and duration of issues related to the overall economy, economic policies, uncertainty, or the current economic environment. Conversely, a decrease in the DEPUC implies a lower frequency of coverage of these words, which would suggest the existence of a certain consensus on such topics, thus reducing the overall

level of uncertainty. Thus, this index could also be understood as a proxy for agents' risk aversion (Amstad et al., 2020)

Figure 1 summarizes the main results of the paper. The main increases in the DEPUC coincide with several episodes, both local and global, during which the general economic uncertainty was substantial: the debt crisis in Europe in 2012, the primary elections in Chile in 2013, or the approval of the tax reform in 2014. After the social unrest of October 2019, the DEPUC increased rapidly to well above its historical average level. However, the Covid-19 pandemic has meant an abrupt and

unprecedented increase in economic uncertainty, with the DEPUC climbing to historic highs of around 2.5 standard deviations in mid-May of 2020, mirroring the responses in other countries (CBCh, 2020).

Finally, the paper emphasizes the usefulness of the DEPUC as a support tool for monitoring activities, studying the effects that the proposed indicator has on the level of the nominal peso-dollar exchange rate. The results indicate that, in addition to the traditional determinants such as the copper price, the interest rate differential and the sovereign risk premium, among others, the general level

of economic uncertainty characterized by the DEPUC has significant effects on the exchange rate, especially in periods of financial market stress, where its level is high. In particular, in an adverse financial scenario, an increase in general uncertainty such as was observed at the onset of the sanitary crisis could depreciate the Chilean peso by between CLP4.8 and 6.4 per dollar instantly, and by between CLP25 and 35 per dollar a week after the shock. In periods of normal functioning of the financial markets, on the contrary, the general level of uncertainty causes no significant effects on the exchange rate.

Surveying the Survey: What Can We Learn about the Effects of Monetary Policy on Inflation Expectations?

Effective monetary policy depends on, among other things, the reactions of financial markets, which in turn depend on the expectations of participants. For this reason, several central banks survey financial agents about their expectations on the future evolution of certain economic variables.

Since December 2009, the Central Bank of Chile (CBCh) has been conducting a survey to financial traders (FTS) on their expectations regarding the monetary policy rate (MPR), inflation, and the exchange rate. The survey differs from comparable surveys, such as the ones conducted by the New York Fed and the European Central Bank, in that it is done both immediately before and immediately after the monetary policy meetings (MPM). In conjunction with the July 2019 pre-MPM survey, respondents were asked to complete a questionnaire to better understand on what they base the predictions provided and how the questions on the future MPR are understood. The responses show that roughly half of the financial operators answer based on what they think the CBCh is going to do (known as the "will

How financial traders understand the question about the future monetary policy rate affects the adjustment of their medium-term inflation expectations in response to surprises.

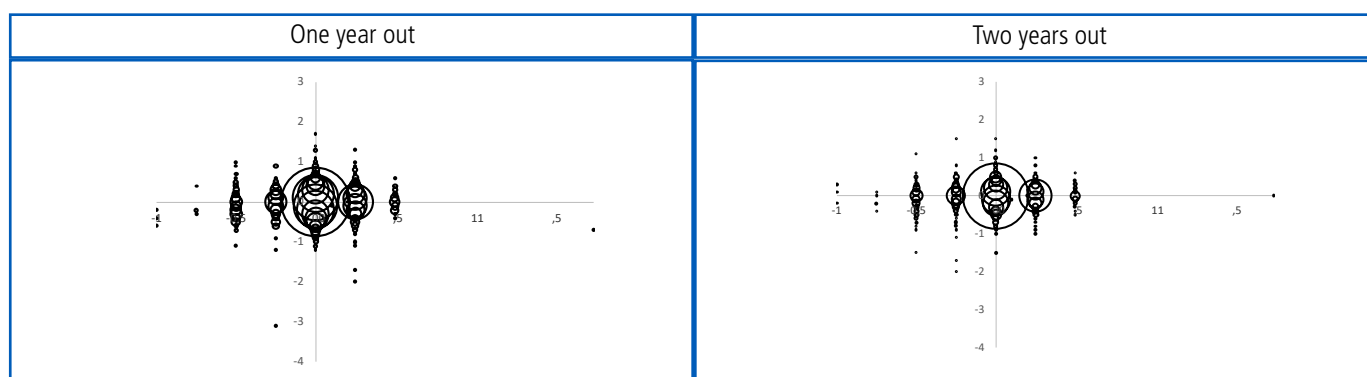
do" operators) at the next meetings, while the other half answer based on what they think the bank ought to do (known as the "should do" operators). Using FTS microdata and questionnaire responses, the CBCh economist, [Michael Pedersen](#), analyzes how financial operators adjust their inflation expectations in response to an MPR surprise in his working paper entitled "Surveying the survey: What Can We Learn about the Effects of Monetary Policy on Inflation Expectations?" ([Working paper of the Central Bank of Chile N° 889, September 2020](#))

Figure 2 shows the surprises in the MPR determined by the CBCh between the surveys and the revisions to inflation forecasts one and two years ahead. Many of the observations are centered where there

are neither a MPR surprise in the next MPM nor updates of inflation forecasts. When surprises do occur, they are typically of $\frac{1}{4}$ or $\frac{1}{2}$ basis points and the revisions to inflation forecasts are often less than one percentage point. For both horizons, simple regressions are slightly sloped upwards.

The empirical analysis controls for contemporary news about inflation, the difference between individual and median predictions from the previous survey, and changes in the exchange rate and the oil price. The findings show that while should-do traders factor MPR surprises into their inflation expectations one year ahead, it is not evident that should-do traders do so as well. This could imply that the "model" traders have in mind includes an endogenous

Figure 2: Weighted Dispersion: MPR Surprises and Inflation Expectations Revisions



Notes: The horizontal axes measure the update of inflation predictions (in percentage points) and the vertical axes measure MPR surprises (in basis points). The sizes of the circles show the number of observations at each point.

trajectory of the MPR, which is not necessarily in line with what they believe the Central Bank will do in the short term. Baseline estimates suggest that agents who simply make their forecasts based on models do not seem to take into account MPR surprises when updating their inflation expectations, but standard errors corrected for small sample size

indicate that traders could do so. Meanwhile, for those who use information only from the financial markets, only the will-do traders adjust inflation expectations in response to MPR surprises, which could be due to the fact that asset prices incorporate what the market believes the Central Bank will do. Inflation expectations two years out are not affected

by MPR surprises. The results help to understand the heterogeneity of analysts' inflation updates and emphasize the importance of understanding whether the respondents base their answers on what they believe the CBCh will or should do.

The Impact of the Covid Public Policies on the Chilean Households

The Chilean government has deployed a battery of diverse policies to address the pandemic. Chile being a country with significant socio-economic inequality and a large fraction of informal workers without access to official unemployment insurance, it is important to analyze the heterogeneous effect of the impact of government policies on household income.

In the paper "The Impact of the Covid Public Policies on the Chilean Households" ([Working paper of the Central Bank of Chile N° 890, October 2020](#)) CBCh economist, [Carlos Madeira](#), uses data from the Households Financial Survey (HFS) of 2017 to conduct an empirical analysis of the impact of the battery of policies deployed by the government on the income of Chilean households. The categories of policy that are identified in the study are (i) income and expenditure support, (ii) tax rebates and deferrals, and monetary policy; and (iii) debt deferral and flexibility. The paper shows that policies related to income and expenditure subsidies have had the strongest impact on households (as a proportion of income), while the policy of tax cuts had a limited impact. Finally, the impact of debt deferment and flexibility policies was concentrated in a handful of highly indebted families.

The results suggest that the impact of income and expenditure support policies amounted, on average, to 21% of permanent household income at the end of August, a significant increase from 13.6% in early April. In addition, the impact of direct aid on average household income (21%) is more than twice the effect of tax deferment and debt relief (9.8%).

It is noted that the "tax reduction/deferral and interest rate reduction" has amounted on

During the Covid-19 pandemic, the policies with the greatest impact were direct household income support, which increased the average family's income by 21% and reached every family, especially the poorest.

average to only 2.2% of the households' mean permanent income. At the same time, the policy of "debt flexibility" has represented 7.6% of the average income, with a more important effect on well-off families, among which it has represented 12.5% of their permanent income. This does not imply, however, that the total amount of debt flexibilization is less than the direct support to household income, given that this policy has a greater impact on higher income families (12.5% in relation to 6.8% of income support) whose income is significantly greater than that of the average household.

Finally, the paper finds that the effect of "income and expenditure support" and "tax reduction/deferral" policies has permeated a large number of families in the lower (households with an income below the percentile 50), middle (households with income percentiles between 50 and 80) and upper classes (households in the upper income quintile, i.e. percentiles 81 to 100) and has therefore been more equitable. On the contrary, the policy of "debt flexibility" had a significant impact only on those highly indebted families belonging to the upper class, while it had no effect on the rest.

EFH 2017	Income and expenses support							
	April				August			
	Pc25	Pc50	Pc75	Average	Pc25	Pc50	Pc75	Average
All households	4,9	9,2	17,5	13,6	5,6	11,8	29,2	21
Lower strata	11,8	16,7	24,1	19,4	12,7	18,7	47,3	31,2
Middle strata	5,4	6,8	9,1	10,2	6,2	9,1	27,1	18,4
High strata	2	3,2	4,1	6,7	2,1	3,2	4,2	6,8
	Tax relief/deferral and monetary policy expansion				Debt deferral			
	Pc25	Pc50	Pc75	Average	Pc25	Pc50	Pc75	Average
	All households	0,1	0,4	1,4	2,2	0	0	10,4
Lower strata	0,2	0,5	1,8	3	0	0	2,1	4,3
Middle strata	0,2	0,4	1,4	2	0	0	12,7	8,8
High strata	0,1	0,3	0,9	0,9	0	7,8	17,8	12,5

Recent Articles Published in Academic Journals by Central Bank Researchers, September-December 2020

- Arroyo, F. "Old crop versus new crop prices: Explaining the correlation". *Journal of Futures Markets*, vol. 40(7), 1192-1208.
- Avanzini, D., J. F. Martínez and V. Pérez. "Assessing mortgage default risk in full recourse economies, with an application to the case of Chile" forthcoming, *Latin American Journal of Central Banking*.
- Bauducco, S. and R. Caputo. "Wicksellian Rules and the Taylor Principle: Some Practical Implications," *The Scandinavian Journal of Economics*, vol. 122(1):340-368.
- Bush, G., T. Gómez, A. Jara, D. Moreno, K. Styryn and Y. Ushakova. "Macroprudential policy and the inward transmission of monetary policy: The case of Chile, Mexico, and Russia," *Review of International Economics* (Online Version Available).
- Cabezas, L. y A. Jara. "Demanda por circulante: hechos estilizados y sustitución por medios de pago electrónicos" forthcoming, *Revista Cepal*.
- Carlomagno, G. and A. Espasa. "Discovering specific common trends in a large set of disaggregates: Statistical procedures, their properties, and an empirical application", forthcoming, *Oxford Bulletin of Economics and Statistics*.
- Carvalho, C., N. Pasca, L. Souza and E. Zilberman. "Macroeconomic Effects of Credit Deepening in Latin America," forthcoming, *Journal of Money, Credit and Banking*.
- Cobb, M. "Aggregate density forecasting from disaggregate components using Bayesian VARs". *Empirical Economics*, vol. 58(1), 287-312.
- Forero, A., F. Gallego, F. Gonzalez y M. Tapia. "Railroads, specialization and population growth in small open economies: evidence from the first globalization," forthcoming, *Journal of Population Economics*.
- Fornero, J., M. Fuentes and A. Gatty. "How do manufacturing exports react to RER and foreign demand? The Chilean case," *The World Economy* vol. 43(1), 274-300.
- Garcia-Cicco, J. y M. Garcia-Schmidt. "Revisiting the exchange rate pass-through: a general equilibrium perspective," forthcoming, *Journal of International Economics*
- Gonzalez, M., and R. Tadle. "Signaling and Financial Market Impact of Chile's Central Bank Communication: a Content Analysis Approach," forthcoming, *Economía*.
- Guerra-Salas, J., M. Kirchner and R. Tranamil-Vidal. "Search frictions and the business cycle in a small open economy DSGE model", forthcoming, *Review of Economic Dynamics*.
- Kirchner, M., and M. Rieth. "Sovereign Default Risk, Macroeconomic Fluctuations and Monetary-Fiscal Stabilization", forthcoming, *IMF Economic Review*.
- Lu, W., F. Zhiyu Feng and C. Zhu. "Financial Integration, Savings Gluts, and Asset Price Booms," forthcoming, *The B.E. Journal of Theoretical Economics*.
- Madeira, C. "The impact of the COVID public policies on the Chilean households", *Applied Economics Letters*, 1-4.
- Madeira, C. "Learning your own ability", Forthcoming, *Journal of Economic Dynamics and Control*.
- Martínez, J. F., U. Peiris and D. Tsomocos. "Financial stability and macro-prudential policy in emerging countries: An application to Chile", forthcoming, *Latin American Journal of Central Banking*.
- Pastén, E., R. Schoenle, and M. Weber. "The Propagation of Monetary Policy Shocks in a Heterogeneous Production Economy," forthcoming, *Journal of Monetary Economics*.
- Pasten, E. "Prudential Policies and Bailouts – A Delicate Interaction," forthcoming, *Review of Economic Dynamics*.
- Pedersen, M., and Caputo, R. "The Changing Nature of the Real Exchange Rate: The Role of Central Bank Preferences," in press, *Economic Modelling*, Elsevier.

Recent working papers of the Central Bank of Chile

Number	Title	Authors	Date
898	Capital Flows and Emerging Markets Fluctuations	Jorge Lorca	January 2021
897	Financial Constraints: a Propagation Mechanism of Foreign Shocks	Rosario Aldunate	January 2021
896	Sovereign Default Risk, Macroeconomic Fluctuations and Monetary-Fiscal Stabilization	Markus Kirchner / Malte Rieth	December 2020
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894	The potential impact of financial portability measures on mortgage refinancing: Evidence from Chile	Carlos Madeira	December 2020
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891	Determinantes del rating soberano: el caso de Chile	Natalia Gallardo / Mauricio Hitschfeld	October 2020
890	The impact of the Covid public policies on the Chilean households	Carlos Madeira	October 2020
889	Michael Pedersen	Surveying the survey: What can we learn about the effects of monetary policy on inflation expectations?	Septiembre 2020
888	Does the Exposure to the Business Cycle Improve Consumer Perceptions for Forecasting? Microdata Evidence from Chile	Fernando Faure / Carlos Medel	September 2020
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885	Heterogeneous Paths of Industrialization	Federico Huneeus / Richard Rogerson	August 2020
884	Does the Commodity Super Cycle Matter?	Andrés Fernández / Stephanie Schmitt-Grohé / Martín Uribe	August 2020
883	Twitter-Based Economic Policy Uncertainty Index for Chile	Andrés Sagner/ Juan Sebastián Becerra	August 2020
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