BOX I.1:

Importance of demand and supply shocks in goods inflation

The significant increase in inflation in Chile since 2021 is strongly influenced by domestic demand factors, followed by supply factors. This Box presents an analysis that confirms this view. The analysis distinguishes the relevance of both types of shocks in the evolution of goods inflation. The results show that in recent months the effects associated with demand factors have been receding, in line with the adjustment of the economy, especially consumption. On the other hand, the decline in commodity prices and the moderation of problems in global supply chains have helped to stabilize supply factors.

Background and decomposition of CPI shocks on output

The last few Reports have presented a decomposition of the factors explaining the rise in inflation based on structural projection models, estimated using aggregate macroeconomic variables. In September, this decomposition showed that roughly two thirds of the increase in cumulative inflation since the beginning of 2021 was explained by internal factors and one third by external factors (figure II.8 in September 2022 MP Report). Among the former, the increase in consumer demand stood out, driven by the strong expansion of liquidity due to fiscal stimulus measures and pension fund withdrawals, as well as the idiosyncratic depreciation of the peso influenced by rising local uncertainty. It was also noted that external factors —mainly associated with supply-side elements— had gained in importance during 2022.

These estimates use aggregate variables. An alternative strategy to analyze the determinants of inflation is to distinguish the importance of demand and supply shocks at the disaggregate level (CPI products) and then aggregate the results to obtain a macro reading. This Box presents the results obtained with this methodology[1].

The factors that explain the increase in goods inflation in Chile

Our results indicate that the dynamics of core inflation of goods during the pandemic can be divided into three periods (figure I.19): the first, beginning in March 2020, includes the initial impact of the Covid-19 shutdown, which generated a supply shock that pushed up prices. At the same time, restrictions on mobility and precautionary savings caused a drop in demand that generated pressures in the opposite direction. In net terms, both effects tended to cancel each other out, which explains the small variation in price levels at the beginning of the pandemic.
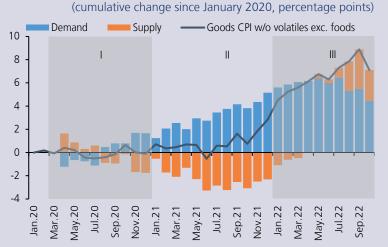
The second period covers all of 2021. During this period, supply normalized as companies adapted and supply chains were re-established. At the same time, the easing of confinement measures and liquidity injections to households generated a strong increase in the demand for goods —reflected in a demand shock that grew steadily throughout the year— which more than offset the normalization of supply, driving a significant acceleration in inflation.

[1] In general, digital invoice (DI) data are used to generate price and quantity indexes for just over 170 CPI items (56% of the basket), mostly goods. A VAR model is estimated for each item, using these indexes. Based on sign constraints, demand shocks are identified as those that generate quantity and price movements in the same direction, and supply shocks that generate movements of these variables in opposite directions. Finally, shocks are aggregated using the CPI basket weights. The analysis in this Box focuses on the aggregate of non-volatile goods excluding foods, for which a coverage of 78% is achieved with the DI. For details, see Carlomagno et al. (2022).

Finally, during 2022, in a context of high demand, the Russian invasion of Ukraine and the zero-Covid-19 policy in China caused a significant increase in commodity prices and a disruption of global supply chains, triggering supply shocks that compounded the already very high levels of inflation[2]/.

FIGURE I.19 STRUCTURAL DECOMPOSITION OF GOODS CPI W/O VOLATILES EXCLUDING FOODS (*)
(cumulative change since January 2020, percentage points)

(*) Historical decompositions of a VAR model with sign constraints for the 177 available Digital Invoive (DI) products. The full CPI basket comprises 303 items, of which 95 are non-volatile goods excluding foods, whose coverage with the DI is 78% (74 items). The black line represents the cumulative evolution from March 2020 to October 2022. Shaded areas denote the following periods: (I) March-December 2020, (II) January-December 2021, and (III) January-October 2022.
Source: Carlomagno *et al.* (2022) based on data from the National Statistics Institute (INE), Internal Revenue Service (SII), and Central Bank of Chile.

In recent months, demand pressures have begun to ease, in line with the macroeconomic and consumption adjustments (figure I.12). Meanwhile, supply pressures have begun to stabilize at the margin, in the face of the decline in commodity prices and the easing of international supply chain problems (figure I.12).

Conclusions

The large expansion of domestic demand that began in 2021 is the main cause of the high inflation the Chilean economy is now experiencing. This conclusion is robust to the estimation strategy used: structural models estimated with aggregate variables and highly disaggregate empirical models yield similar readings. The empirical analysis presented in this Box suggests that demand pressures on goods inflation have begun to ease in recent months, while supply pressures have stabilized at the margin. In turn, services inflation —not analyzed in this Box— has continued to increase and will show greater persistence due to price indexation. Accordingly, the recently observed moderation in inflation (figure I.6) is expected to continue in the coming months, provided that no new disruptive events occur.

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[2]/ It should be noted that, in this decomposition, supply shocks can represent "pure" supply shocks (e.g., cost shocks) or an exchange rate depreciation. In fact, an alternative identification strategy including exchange rate changes suggests that a portion of these supply shocks can be attributed to exchange rate movements.