Dissecting Consumer Prices in Chile: From Globalization to Global Supply Chain Pressures

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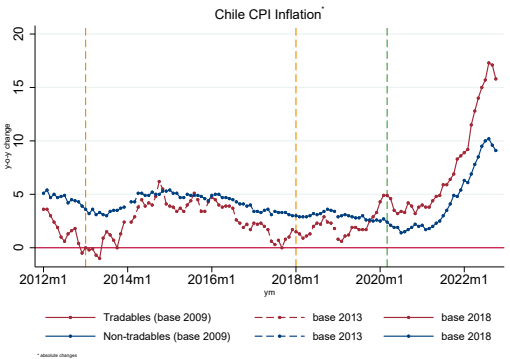
Overview

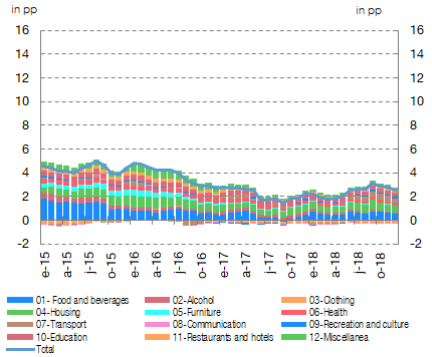
Motivation: From Contained Inflation to High Inflation

- The recent inflation surge requires a better understanding of price developments
- After many years of subdued inflation, mainly in tradable goods, price developments -not only- in Chile show a very different pattern $\Rightarrow$ Annual CPI inflation reached 13.7% in Sept./12.8% Oct.
- This work focus on **the role of trade openness and imported inflation**.



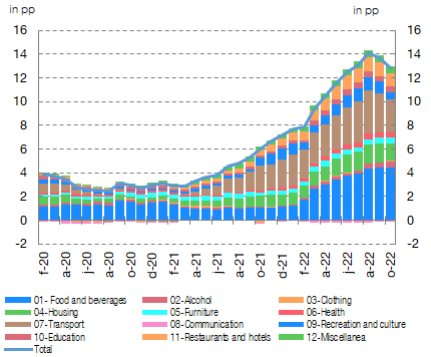
Contribution by Division to Aggregate CPI Dynamics

CONTRIBUTION TO CPI BY DIVISION
2015-2018



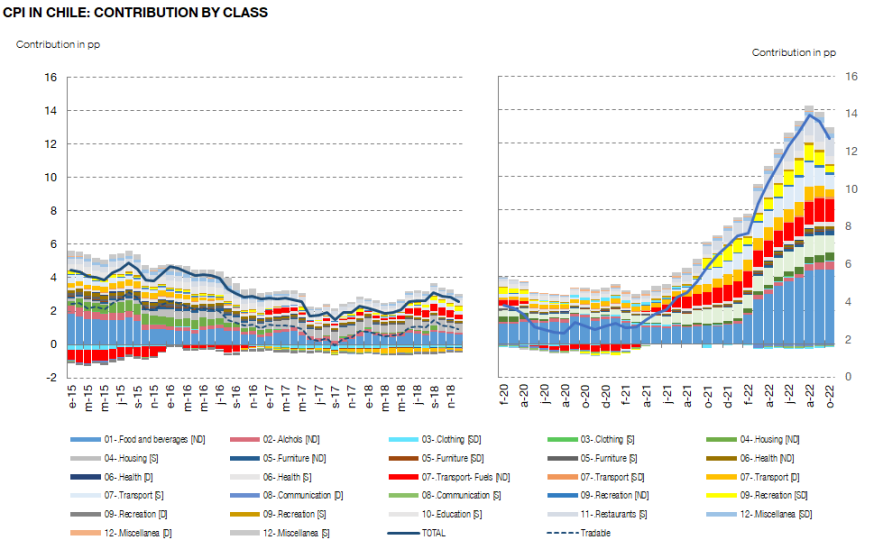
National Statistical Office

CONTRIBUTION TO CPI BY DIVISION
2020-2022



National Statistical Office

Contribution by COICOP Class to Aggregate CPI Dynamics



Our Contribution

- We use a large administrative dataset. This allows us to explore inflation developments with more detailed approach.
- The time span covered of this dataset, allows us to explore the role on prices of the emergence of Asia $\Rightarrow$ This region became an important supplier of intermediate inputs and final goods to the world economy, and Chile also benefited from it.
- **This paper:**
  1. What has been the impact of the emergence of Asia as a supplier of intermediate inputs and final goods on prices in the Chilean economy?
  2. How have changes in international trade due to the pandemic and recent global developments influenced inflation dynamics?

Analytical Framework

Based on **Carluccio et al. (2018)**. Simple accounting framework that exploits customs granular data.

$$p_t = \beta_t p_t^T + (1 - \beta_t) p_t^{NT}$$

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$$p_t^T = \eta_t (p_t^F) + (1 - \eta_t) p_t^D$$

$$p_t^F = \gamma_t p_t^{LWC} + (1 - \gamma_t) p_t^{HWC}$$

Breaking down CPI

$$\Delta p_t = \underbrace{\beta_t \; \Delta \; \eta_t \; \gamma_t \; (p_t^{LWC} - p_t^{D})}_{\text{Substitution effect}} +$$

$$\underbrace{\beta_t \; \eta_t \; [\; \Delta \; \gamma_t \; (p_t^{LWC} - p_t^{HWC}) + \gamma_t \; (\pi_t^{LWC} - \pi_t^{HWC}) \;]}_{\text{Imported inflation channel}} +$$

$$\underbrace{\beta_t \; (1 - \; \eta_t \;) \; \pi_t^{D}}_{\text{Competition channel}} + \Lambda_t$$

- β_t: share of tradables in total consumption
- η_t: share of tradables that are imported
- γ_t: share of imports from LWC in total imports

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- Δp_t: is the y-o-y variation in Chilean CPI
- p_t^D: price level of domestic goods
- p_t^{LWC}: price level of imported goods from LWC
- p_t^{HWC}: price level of imported goods from HWC
- The role of FX: passed-through at the border 0,35 (by Giuliano and Luttini (2019)). Degree of pass through at the store?

Datasets I

- **Customs registries/declarations** Chilean Customs from 2003 - up to Sep 2022.
  $\Rightarrow$ We work on an annual frequency to smooth the series and avoid seasonal issues
- From each type of declaration (import/export) we use information of each transaction (1) the shipment value, (2) the country of origin/destination and (3) the product code. $\Rightarrow$ All transactions refer to goods.
- **Product correspondences:**
  - Each traded product is classified according to Harmonized System at 6 digit (HS-6).
  - We focus on Consumption goods based on the Broad Economic Categories (BEC)
  - Each consumption product is matched with the COICOP classification at the division-group-class level, which is the classification used to construct the Consumer Price Inflation (CPI). Based on Cavallo et. al (2019)
  - Merged with SII to obtain information as regard the firm involved in the transaction.

Datasets II

- We make use of the most up to date Inter-Country Input-Output (ICIO) tables from the OECD (2021 Release) to compute openness parameters.
- National Statistical Office to obtain official CPI, contributions and weights at the division/group/class level.

Basic Calculation on Prices

Unit values

- The proxy of the price of a good-variety i, invoiced in currency c, shipped from country x, at time t is:

$$p^{m,x}_{f,i,c,t} \approx uv^{m,x}_{f,i,c,t} = \frac{\text{value}_{f,i,c,t}}{\text{quantity}_{f,i,c,t}}$$

- For each type of transaction either an import (m) or an export (x) we compute uv payed/charged by each firm f, for each product i, for a country of origin/destination c at time t.
- Note that UV are an imprecise proxy for prices because there may be more than one distinct product within an HS6 digit code.

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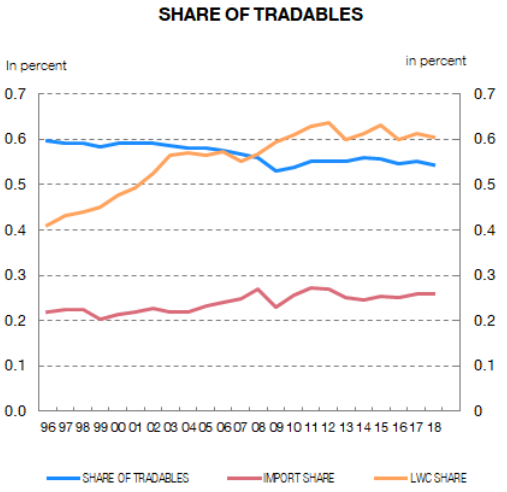
Price Indices

- Each COICOP category is weighted according to the National Statistical Office weights to construct aggregates.

$$P^T_{i,t} = \Pi_j P^{\omega_{ijt}}_{ijt}$$

- Where, the Price index of tradable P^T of product i at time t is the set of prices of domestic varieties is denoted by D and the foreign varieties by F.
- The share of of imports in total consumption of i is $\eta_{it} = \sum_{j \in F} \omega_{ijt}$.

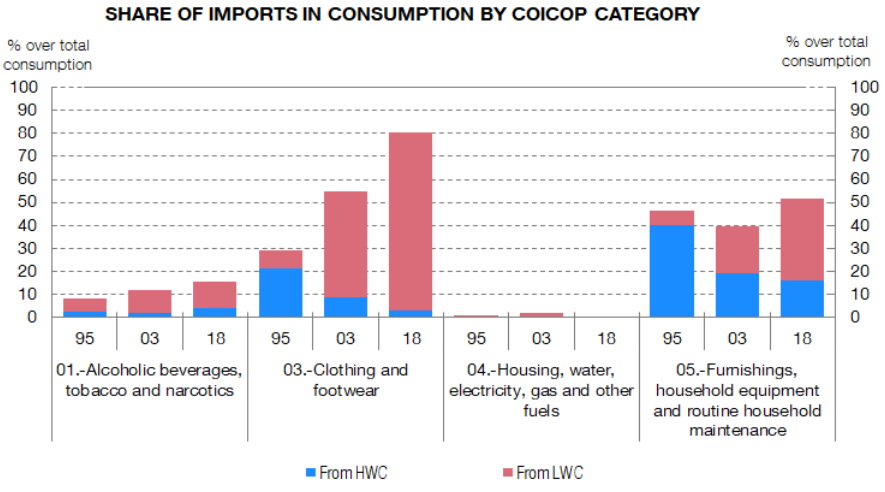
Trade Openness and Origin of Imports



The evolution of the three measures used to capture the exposure to imports:

- The (nominal) share of tradables over total consumption (β_t) $\Rightarrow$ along the period 1996-2018 on average 60%, showing a declning trend
- The share of imports over total consumption (η_t) $\Rightarrow$ stable at around 24%.
- The share of imports from LWC (γ_t) $\Rightarrow$ from 40% in 1996 to 60% in 2018

Import Intensity of CPI Divisions



Notes: Direct import content in Consumption. **Data source:** ▸ ICIO 2021 release

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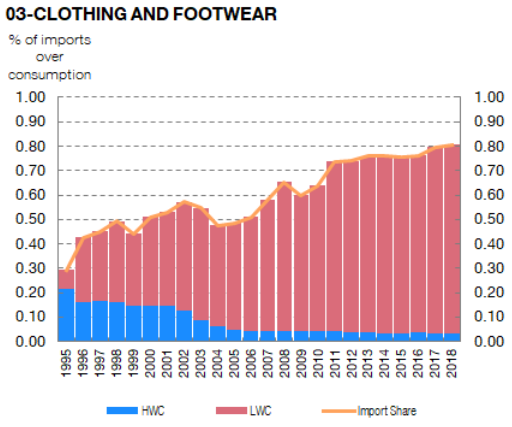

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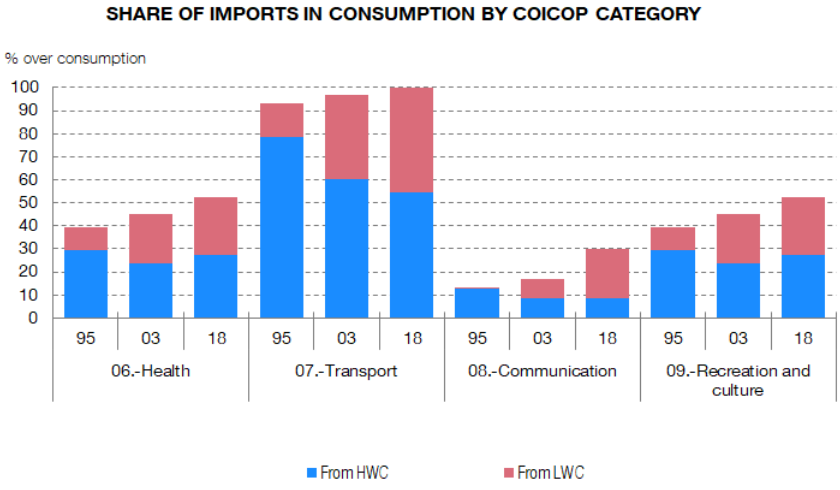
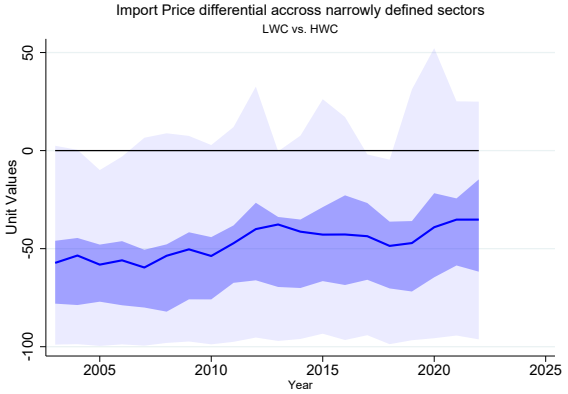


Notes: Direct import content in Consumption. **Data source:** ▸ ICIO 2021 release

Relative Prices: $(P^{LWC} - P^{HWC})$

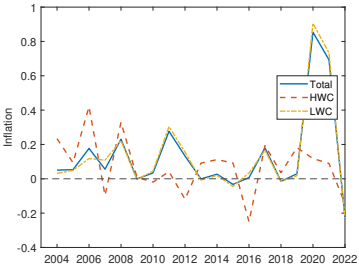


The price differential at the level HS6 between unit values from LWC origin with respect to HWC origin:

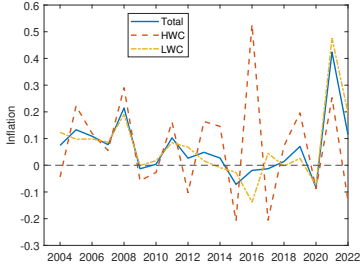
- Price differentials remained mostly unchanged
- Wide dispersion in price differential, no major changes observed from 2019 onward

Import Price Inflation: π^{LWC} vs. π^{HWC}

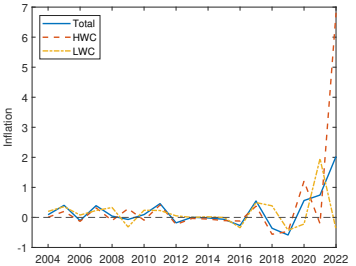
03.- Clothing and footwear



05.- Furniture



07.- Transport

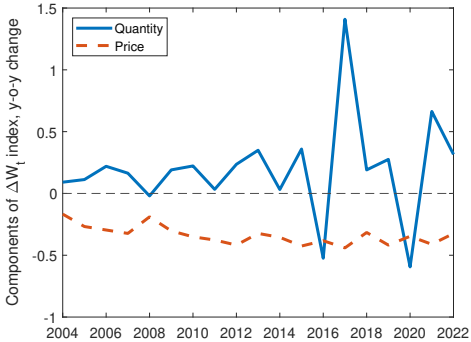


Note: Price inflation computed for each class. The Price Index are constructed using the multilateral GEKS that allows to account for the entry and exit of varieties. The yellow line is the import price inflation for goods produced in LWC. The orange line the price inflation for goods produced in HWC. The blue line accounts for the overall import price index.

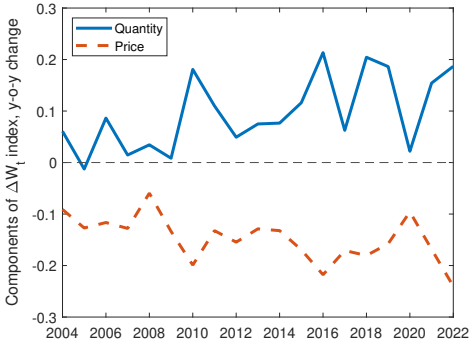
Expenditure Switching

▸ Div 03 ▸ Div 05

511.- Furniture

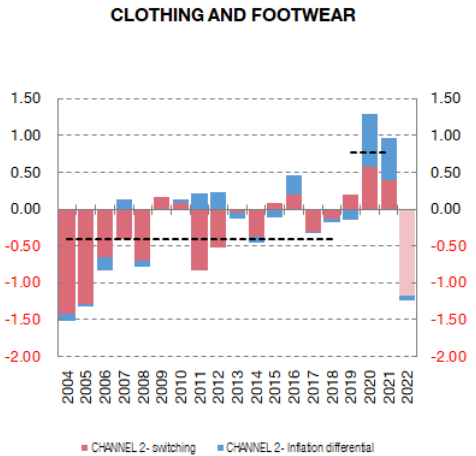


520.- HH textiles



Note: This figure reports price and quantity share indexes that measure y-o-y shifts in relative prices and consumed quantities between high/low unit value items within HS6-digit product groups. A negative value for the quantity index, defined as the quantity component of the index, implies a systematic shift in quantities consumed toward lower unit value items. A positive value for the price index, defined as the price component of the index, implies a systematic decrease in the relative price of lower unit value items. The reported indexes aggregate results for product groups using each group's share in total 03-Clothing and Footwear expenditures.

Impact on CPI: Clothing and Footwear



- In "Clothing and Footwear"...
- The **switching effect** had a higher impact at early stages.
- The **Inflation differential** played a moderate role

Note: Data in 2022 up to September/ high seasonality.

An International Comparison

Country	Period	Impact of LWC imports on Import Inflation	Source
Chile	2005-2022	xx pp	This study
Chile	2005-2015	-0.34 pp	Separata BCCh 2020
France	2000-2005	-0.74 pp	Carluccio et al (2018)
France	1995-2005	-0.48 pp	Carluccio et al (2018)
Portugal	1998-2006	-0.2 pp	Cardoso and Esteves (2008)
United Kingdom	2000-2005	-0.7 pp	Mac Coille (2008)
Austria	1995-2005	-0.66 pp	Glatzer et al. (2006)
Finland	1996-2005	-1 pp	Bank of Finland (2006)
Sweden	1996-2004	-1 to -2 pp	Sveriges Riksbank (2005)
United States	1993-2002	-0.8 to -1 pp	Kamin et al (2006)

Note: this table reports estimates of the contribution of LWC imports to import price inflation in different countries. These estimates are obtained using a similar methodology and correspond to "imported inflation effect" (channel 2). Differences in methodologies may come from the definitions of country categories and also from the level of product disaggregation.

Main Results and the Way Ahead

- We quantify the impact of imports on (short) Chilean CPI inflation
- **A look under the hood** $^{(copyright)}$ with a focus on the impact on π through trade. We explore the impact of changes in relative prices, inflation differentials and the impact on quantities
- We estimate to what extent imports from LWC contributed to bring down the cost of living/CPI, how this effect might have changed during the pandemia and subsequent shocks.
- We find heterogeneity across divisions and interesting facts at detailed product level.

The way ahead

- Explore Channel 3 $\rightarrow$ competition effects

Thanks!

Selected References

Albagli, E., Grigoli, F. Luttini, E. (2022) "Inflation expectations and the supply chain" *IMF Working Paper 161*.

Bems, R, and Di Giovanni, J (2016) "Income Induced Expenditure Switching" *AER 106(12):3898-3931*

Carluccio, J, E. Gautier and Guilloux-Nefussi, S. (2018) "Dissecting the Impact of Imports from Low-Wage Countries on Inflation" *Working Paper Series No. 331 / 2018, Banque de France*.

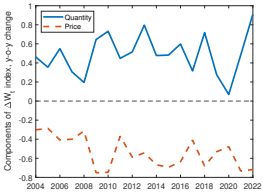
Cavallo, A., Gopinath, G., Neiman, B and J. Tang (2019) "Tariff Passthrough at the Border and at the Store: Evidence from US Trade Policy" *WP Harvard Business School* 20-041.

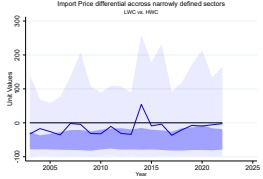
Giuliano, F. Luttini, E. (2019) "Import prices and invoice currency: evidence from Chile" *BIS Working Papers 784, Bank for International Settlements*.

Expenditure Switching

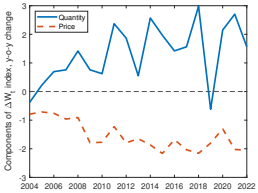
Back

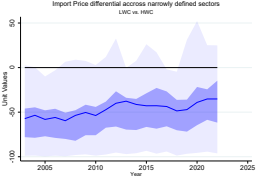
0.311.- Clothing materials (SD)





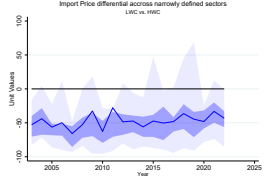
0312.-Garments (SD)





0313.- Other articles of clothing and clothing accessories (SD)

0321.- Shoes and other footwear (SD)



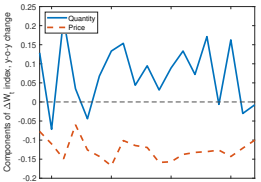
Expenditure Switching

Back

Furniture and furnishings (D)

Household textiles (SD)

Major household appliances whether electric or not (D)



Small electric household appliances (SD)