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Argentinian Retail Coffee Market: Effects of Instability on Pricing

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Abstract

Coffee ranks among the most important drinks in the World. In Argentina it has an increasing place in the household consumption pattern. As in most foods markets, attributes play key roles in pricing but in a context of increasing inflation and exchange rate devaluations pricing becomes more complex. We analyze how micro-determinants affect the rate of price variation in the retail coffee sector under increasing inflation. We identify a predictable strong influence of black market and official exchange rate but also in diverse attributes such mainly brands and also processing, grain, and variant. We also present a detailed impact of the timing in pricing: weekly, monthly, yearly, and even lockdown effects are presented and discussed.

1. Introduction

Coffee is one of the most important drinks in almost any country's diet. The bean originates in Africa, and all the species planted around the World have this origin. It is produced throughout a chain value or network production (Grabs and Ponte, 2019; Bravo-Monroy, 2019; Raynolds, 2002). Several varieties of coffee have all derived from the three species of the Rubiaceae family: *Coffea Arabica*, *Coffea Canephora* (Robusta), and *Coffea Liberica* (Liberian). Coffee cherries or beans are roasted and then dried. At the retail point-of-purchase, the most popular presentations are ground coffee and instant coffee. While cooperation may emerge between producers (González-Pérez and Gutiérrez-Viana, 2012), Brazil, Vietnam, and Colombia are the greatest World producers although presenting a declining trend in the total rents obtained in the chain value of the sector (Talbot, 1997) and also dealing with environmental consequences (Rice, 2003).

Although Argentina is still far from countries such as Norway, Finland, or the United States, coffee consumption has shown sustained growth in recent years. Patterns have changed following the enormous technical development and professionalization of all links in the production and service chain driven by the explosion of what is known as the Third Wave or Third Generation of Coffee (Manzo, 2014). A worldwide study of coffee consumption patterns is in Samoggia and Riedel (2018). By 2014 Argentinians consumed an average of one kilo of coffee per year per capita. Seventy percent of consumers prefer to drink it in the morning, and half of the coffee drinkers drink up to three cups per day. In terms of tastes, Argentinians prefer milder coffees, while abroad, in countries like Italy, the aim is for darker roasts. The consumption of coffee-based beverages, such as hot and cold cappuccinos, specialty coffees, such as cold brew, grew in some years by 15%. In a more gourmet fashion, the sale of sightground coffees increases chosen by those who like to enjoy different blends in their homes (Cámara Argentina de Café, 2014). As a percentage of income, households spend .1% on instant coffee and .04% on ground coffee. This expenditure is less than three times smaller in comparison to a more traditional infusion such as the *yerba mate* (*Ilex paraguariensis*) that reaches .48% (INDEC, 2020).

Pricing under increasing *inflation* is a pressing issue for the private sector. At the same time, *attributes* may entice pricing options for products. The grain, the packaging, how is processed, the type, among others, are items to be accounted for when analyzing coffee prices. How these two factors interacted in the retail pricing decisions involving this product in Argentina? In this contribution, we analyze this market and we focus on key determinants explaining weekly price variations. This is sadly an endemic disease in the Argentinian economy (with inflation escaping international parameters since the 1950s) were even under the period of study relative coffee prices altered previous rankings. This way, the goal of this contribution is to explain statistically food sectorial pricing in Argentina.

The contribution follows with a section 2 where a literature review is performed. Section 3 is next with the methodology and estimations, section 4 presents the analysis of the results and section 5 ends with discussions.

2. Literature review

Coffee production initiates with small producers planting and harvesting green cherries or beans (Mehta and Chavas, 2008), followed by industrial roasting, roasted beans passing into ground coffee, or processing even further obtaining instant coffee. Prices of Arabica coffee variants at the farm gate in Latin America have been influenced by inflation, incomes, weather shocks, and production stocks (Aliaga Lordemann et al., 2021). Several contributions explicit this process in detail as Gibson and Newsham (2018: ch. 18), Gressel and Tickell (2002), and Giovannucci and Koekoek (2003). *Fair Trade* is a term that has emerged to differentiate the products by their production origin and retail from those in the mainstream commercial market, and to highlight the unfairness of many commercial interactions, especially given that the main coffee producers are undeveloped countries (Love, 1999). This term encompasses a process of informing consumers on the unfair production conditions of developing countries (de Ferran and Grunert, 2007; Lewin et al., 2004: 123; Gressel and Tickell, 2002; Raynolds, 2002; Durevall, 2015) that focus later on corporate social responsibility (Hejkrlík et al., 2013) and the ethical dimension of coffee consumers (Bird and Hughes, 1997). The label appeals to the moral and environmental values of consumers that even chose to pay premium prices (Yeoman and McMahon-Beattie, 2006: 325; Maciejewski et al., 2019). Diverse contributions also study how consumers change perceptions and pay disposition when the option is available (Schollenberg, 2012; Stratton and Werner, 2013). Argentina has recently adopted practices on Fair Trade labeling (*Comercio Justo*, as translated into Spanish) but not yet in coffee products.

Among all the existing varieties, instant and ground coffee stand out because they have become commonplace in some countries. For instance, instant coffee has high acceptance in female consumers for all income groups and three-quarters of the demand is focused to coffee (ground) granules in the UK (Fitter and Kaplinsky, 2001: 75-76). On the other hand, roasted and ground coffee accounts for almost 90% of all coffee consumed in Sweden, while instant coffee accounts for 10% since the 1980s (Durevall, 2007). Quality is relatively high and uniform: the Arabica bean, mainly used in high-quality coffee, makes up close to 100% of bean imports, while Robusta, used in more low-quality coffee, espresso, and instant coffee, is not utilized in coffee roasted for local retailers. This is also a market with variable cost pass-through from green beans to roasted and ground coffee: market share is positively correlated with pass-through (Durevall, 2018) although in general transmission from producers to retailing is small (Mehta and Chavas, 2008). That was also observed in the Dutch (Bettendorf and Verboven, 2000) and the American coffee markets (Leibtag et al., 2007). However, India has a less concentrated instant coffee market (Deodhar and Pandey, 2008).

In China, the coffee market is emerging given cultural changes that accompanied increasing incomes (Ferreira and Ferreira, 2018). Multinational firms are strategically embracing 'sustainable coffee' to build a reputation and consumer trust (Elder et al., 2014). This was a trend among mass retailers that is transforming the social and environmental governance of coffee production and revealing several critical emerging areas of development studies research regarding the impact of big retail power.

Asymmetric pricing is studied in Gómez et al. (2009), where it is observed that at least in three countries it is easier for prices to increase than to decrease. The passing-through from wholesale cost to retail price is also analyzed in Bonnet et al. (2013) and Bonnet and Villas-Boas (2016): wholesale prices pass through increases, but not decreases, to retail pricing. However, in an inflationary context, asymmetric pricing is foreseeable. In our case, Argentina during this period was a country with persistent inflation (Cachanosky and Ferrelli Mazza, 2021). The purchasing power of income declines given these sudden increases are not matched and asymmetric pricing is present with high probability. In such a scenery, what role do attributes and marketing tactics play in determining price? How constrained was pricing by macroeconomic instability?

Economic literature often states that retailers are able to take advantage of consumers' biases in order to increase their benefits. For instance, it is reasonable to think that sellers in the United Kingdom used to exploit errors in price-weight-quality comparisons (McGoldrick and Marks, 1985) and lack of price awareness (McGoldrick and Marks, 1987; Le Boutillier et al., 1994). It was also proved that "psychological pricing points" affected both static coffee price setting and dynamics in Germany (Fengler and Winter, 2001; Herrmann and Moeser, 2006).

However, during inflation, consumers tend to change their behavior: they search for more information and evaluate more alternatives. Many studies rely on hedonic model correlating attributes with prices, but this is a picture of a point in time. If prices changes even altering relative prices, do the correlations remain? In a context of increasing inflation prices change periodically at fast pace. The act of buying becomes more thoughtful, and consumers are also more prone to switch between brands. While staying behind the rate of inflation might hurt income, undercutting seems sweeter down in the aisle. What determine changes in a framework of macroeconomic instability, like in the case of retail coffee in Argentina? We investigate the role of attributes on retail coffee price changes in the context of an inflationary economy like the Argentina. It must be taken into account that the country suffers monthly inflation rates similar to a yearly inflation of any other country.

3. Methodology and Estimations

Data come from the IPC Online project (Uriarte et al., 2019). We gathered data from 57 brands of ground coffee and 21 brands of instant coffee. Price data were extracted from the websites dates back to the 1st week of December 2015 to the 4th week of February 2021 in a weekly frequency (another contribution using this data frequency is Guadagni and Little, 1983) where one week is defined from 1st-7th, 8th-14th, 15th-21st, and 22nd-28th day-windows of each month. This way, each month has at least four weeks for 63 months totaling 252 observations/weeks per series. Our results focus on very short-term periods where sensitivity should be interpreted as high inflation expectation if statistically significant. Prices came from mainstream retail (supermarkets and hypermarkets) websites.

Inflation accumulates 30 to 50% yearly over the period (Cachanosky and Ferrelli Mazza, 2021). Marketing decisions have to be made under constant changes in prices (Doyle, 1976). The purchasing power of incomes declines accordingly given these increases have not been matched on time. In sceneries like this, consumers tend to change their behavior. Buyers search for more information and evaluate more alternatives. The very act of buying becomes more thoughtful, and consumers are also more prone to switch between brands (Doyle, 1976). Even relative prices may be altered. Average prices are presented in Table 1. As observed, ground coffee was cheaper by kilo in 2016, but by the end of the period it had become the most expensive item.

Table 1. Arithmetic Average of Pesos per Kilo by Type of Coffee by Year

Type/Year	2016	2017	2018	2019	2020
Ground coffee	432.06	560.99	704.87	1,013.44	1,178.23
Instant coffee	567.09	691.06	853.60	858.05	920.28

Ground coffee: 57 brands; Instant coffee: 21 brands. Frequency: Weekly. Source: The Authors

We research our question via a random effects (RE, henceforth) panel data model and, given the presence of heteroscedasticity, a generalized least squares (GLS, from here on) model. In the regressions, the RE model is included as a control because many variables disappear if they are estimated by fixed effects (variables such as flavor or company, among others, are canceled with the transformation). The heteroscedasticity test in panels (Sosa Escudero and Bera, 2008) indicates the presence of heteroscedasticity, validating the GLS specification.

Consider a dynamic panel data model with units $i=1,2,\ldots,N$, and a fixed number of time periods $t=1,2,\ldots,T$, with $T\geq 2$.

$$p_{i,t}=\beta_0+\delta\, p_{i,t-j}+\beta_1 x_t^{'}+\beta_2 f_i^{'}+\varepsilon_{i,t}\,,\varepsilon_{i,t}=\alpha_i+\mu_{i,t}$$

where $x_t^{'}$ is a $K_x\times 1$ vector of time-varying variables. The initial observations of the dependent variable, y_{i0}, and the regressors, x_{i0}, are assumed to be observed. f_i is a $K_v\times 1$ vector of observed time-invariant variables that includes an overall regression constant, and α_i is an unobserved effect fixed effect of the i-th cross section and is allowed to be correlated with all of the explanatory variables x_t and f_i. It is also a random effect if it is independently distributed and correlated with the lagged dependent variable by construction.

We try to explain the retail coffee price dynamics in Argentine supermarkets. Therefore, we model the rate of variation of the price of a specific coffee packaging in a week. We need to decouple main coffee attributes departing from type, variant, grain, and packaging, among others.

We use panel data analysis for interpreting the relationship among variables. Variables represent information about prices, attributes, macroeconomic stability, time effects, and costs. We now describe the variables involved in the analysis.

3.1 *Explained variables*

We use as the explained variable the rate of variation per week of each coffee presentation:

- $y_{i,t}$: Weekly price variation of item *i* on time *t* (*t* runs from 1st week December, 2015 to 4th week February, 2021)

3.2 *Attributes*

We also control for specific product attributes: package weight, average price during the period, type, brand, processing, grain, packing and if it is promoted as imported.

- **Producer:** x_i^{fi}: Manufacturers are numbered as $x_i^{f1} \ldots x_i^{f9}$ present in the market. Producers largely overlap with brands in many estimations so they practically were discarded of the estimations.
- **Weight:** x_i^{lw}**:** represents the natural logarithm of the weight of the container, looking to observe if there exists any asymmetric pricing related to size (McManus, 2007).
- **Average price**: x_i^{lp}: represents the natural logarithm of the average price of the packaging during the period. The variable is tested based on the conjecture that top-tier brands may differ in pricing respect to lowest-tier brands.
- **Type**: x_i^{typ-1}: Ground; x_i^{typ-2}: Instant.
- **Brand**: Brands present in the market are numbered as $x_i^{bra1} \ldots x_i^{bra13}$, where x_i^{bra1}: 51; x_i^{bra2}: 5 Hispanos; x_i^{bra3}: Arlistán; x_i^{bra4}: Bonafide; x_i^{bra5}: Cabrales; x_i^{bra6}: Durban; x_i^{bra7}: La Morenita; x_i^{bra8}: La Virginia; x_i^{bra9}: Nescafé Coffee Mate; x_i^{bra10}: Nescafe Dolca; x_i^{bra11}: Nescafe Dolce Gosto; x_i^{bra12}: Nescafe Gold; x_i^{bra13}: Primer Precio;
- **Imported**: x_i^{imp}: Dummy for import. Coffee is not produced locally. This variable instead marks those brands that advertise themselves as imported from a high-quality producer, such as Colombia.
- **Processing:** x_i^{p-1}: Toasted; x_i^{p-2}: Roasted;
- **Grain:** x_i^{g-1}: Arabica; x_i^{g-2}: Robusta; x_i^{g-3}: Blend;
- **Packaging**: x_i^{pac-1}: bag; x_i^{pac-2}: capsule; x_i^{pac-3}: soft;
- **Variant**: x_i^{var-2}: capuccino; x_i^{var-3}: classic; x_i^{var-4}: intense;x_i^{var-5}: soft;

Table 2 presents frequency distributions of each attribute in the sample. As can be observed, the most frequent brand is Cabrales (22 products), whereas the mode of the weight of the container is .5 kg (19 products). It can also be found that, compared with toasted coffee (26 products), roasted coffee seems to exhibit a higher degree of differentiation (47 products). On the other hand, "soft" seems to be the most differentiated type of packaging (66 products against 4 goods in "bags" and 8 in "capsules"). Finally, the table shows that only 14 out of 78 products advertise themselves as imported from a high-quality producer.

Table 2. Variable Frequencies

Brand	Qty	Firm	Qty	Weight	Qty	Grain	Qty	Packaging	Qty
x_i^{bra1}	2	x_i^{f1}	2	0,087	1	x_i^{g-1}	24	x_i^{pac-1}	4
x_i^{bra2}	2	x_i^{f2}	2	0,09	11	x_i^{g-3}	4	x_i^{pac-2}	8
x_i^{bra3}	4	x_i^{f3}	11	0,1	16	NA	49	x_i^{pac-3}	66
x_i^{bra4}	11	x_i^{f4}	22	0,14	1	x_i^{g-2}	1		
x_i^{bra5}	22	x_i^{f5}	9	0,17	9				
x_i^{bra6}	1	x_i^{f6}	12	0,18	1	**Type**	**Qty**	**Import**	**Qty**
x_i^{bra7}	8	x_i^{f7}	4	0,25	16	NA	5	0	64
x_i^{bra8}	12	x_i^{f8}	15	0,5	19	x_i^{p-2}	47	1	14
x_i^{bra9}	1	x_i^{f9}	1	1	4	x_i^{p-1}	26		
x_i^{bra10}	4								
x_i^{bra11}	8								
x_i^{bra12}	2								
x_i^{bra13}	1								

3.3 *Financial variables*

We take a number of variables that represent the financial instability of the period. We expected to observe a pass-through effect from exchange rate (ER) to local prices (Nakamura and Zerom, 2010; Nakamura et al., 2011). Special interest then is given to the rate of exchange in Argentina where an official ER and a black market (called *blue* in Argentina) ER coexist: they will be notated as official (*ofc*) and blue (*blu*) exchange rates respectively. As a country with continuous inflation, local currency tends to depreciate constantly and the American dollar is the immediate alternative for keeping the value of money. Government by controlling the supply of the ER alter its availability so a black market (free market) emerges. So, we obtain data from Pullman[1] and the financial newspaper Ámbito[2] for obtaining online daily data for official and blue rates, respectively. We also add metrics related to exchange rate at the weekly frequency. For instance, intra-week volatility (standard deviation of the weekly ER variation), spread between selling and buying values of currency (as an expectation of devaluation), the quantity of changes in prices during a week as a sign of sharp expectation in the short-run, and finally, *kurtosis* and *skewness* of weekly ER variation. These last two metrics are measures related to the shape of the distribution of ER variations. The first portraits information related to a distribution being *platykurtic* (negative kurtosis) or *leptokurtic* (positive kurtosis). The second gives details about the distribution having negative or positive skewness. If the distribution is leptokurtic (positive kurtosis), then there is a high concentration in high variation values during the week fueling devaluation expectation, whereas if the distribution approximates to platykurtic (negative kurtosis), then changes are smoother across the week. On the other hand, if the distribution has negative skewness (high skewness), then the mean variation is lower than the median, anticipating also a higher probability of a devaluation. When adjusting models, we will not consider both types of exchange rates at once: one estimation will control for the official ER, while another one will adjust for the *blue* ER.

1 http://www.pullman.com.ar/

2 https://www.ambito.com/contenidos/dolar-informal-historico.html

- $f_t^{fin-ofc-sd}$,$f_t^{fin-blu-sd}$: weekly average variation of daily official/blue selling dollar
- $f_t^{fin-ofc-spr}$, $f_t^{fin-blu-spr}$: spread refers to the gap between official/blue buying-selling dollars to its average in Bahia Blanca/Argentina.
- $f_t^{fin-ofc-stdsd}$, $f_t^{fin-blu-stdsd}$: standard deviation of weekly official/blue selling dollar value variation
- $f_t^{fin-ofc-qo}$, $f_t^{fin-blu-qo}$: quantity of price changes in the official exchange rate during a week
- $f_t^{fin-ofc-ksld}$, $f_t^{fin-blu-ksld}$: kurtosis of $f_t^{fin-ofc-sd}$, $f_t^{fin-blu-sd}$
- $f_t^{fin-ofc-skwsd}$, $f_t^{fin-blu-skwsd}$: skewness of $f_t^{fin-ofc-sd}$, $f_t^{fin-blu-sd}$

3.4 *Cost and time variables*

Following Nazlioglu and Soytas (2012), we consider the potential pass-through effect of gasoline on prices and include the variation of gasoline prices jointly with variation in the food and beverages and general consumer price indices.

- $f_t^{cost-oil}$: weekly oil price variation
- $f_t^{cost-inf}$: weekly consumer price index variation

Finally, time control variables are considered in order to capture seasonal and cyclical effects. In addition to the traditional adding of the month and year effects we take into account weekly effects.

- **Week dummies**:f_t^{s1}: dummy for 1st week; f_t^{s2}: dummy for 2nd week; f_t^{s3}: dummy for 3rd week. The fourth week is out given a collinearity issue.
- **Month dummies:** f_t^{m12}: December; f_t^{m1}: January; f_t^{m2}: February; f_t^{m3}: March; f_t^{m4}: April; f_t^{m5}: May; f_t^{m6}: June; f_t^{m7}: July; f_t^{m8}: August; f_t^{m9}: September: f_t^{m10}: October. November is discarded by collinearity.
- **Year dummies:**f_t^{y16}: year 2016; f_t^{y17}: year 2017; f_t^{y18}: year 2018; f_t^{y19}: year 2019. 2015 and 2021 years (having one and two months each, respectively) were discarded.
- **Lockdown**: f_t^{lock}The time from March 2020 to November 2020 has been a strict lockdown period for the entire country given the Sars-Cov-2 pandemic (Larrosa, 2021). We create a dummy for this period to test its consequences on pricing (see also Jaravel and O'Connell, 2020).

Table 3. Selected Variable Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
$f_t^{cost-oil}$	0.007	0.020	-0.039	0.105
$f_t^{fin-ofc-bd}$	0.011	0.052	-0.101	0.614
$f_t^{fin-ofc-spr}$	2.397	2.054	0.106	8

$f_t^{fin-ofc-stdsd}$	0.341	0.712	-	5.097
$f_t^{fin-ofc-qo}$	11.127	5.883	4	45
$f_t^{fin-ofc-ksld}$	0.997	3.450	-3.901	19.400
$f_t^{fin-ofc-skwbuy}$	0.074	1.184	-4.407	2.828
$f_t^{fin-ofc-skwsd}$	0.066	1.180	-4.367	2.828
$f_t^{fin-blu-sd}$	0.009	0.033	-0.145	0.203
$f_t^{fin-blu-spr}$	2.145	2.496	0.150	10
$f_t^{fin-blu-qo}$	4.714	0.683	3	9
$f_t^{fin-blu-ksld}$	-0.320	2.278	-6	5
$f_t^{fin-blu-skwsd}$	0.050	1.012	-2.236	2.236
$f_t^{fin-blu-stdsd}$	0.715	1.349	0	9.985

4. **Estimation and Analysis**

As it was stated above, we research our question via panel data modeling. We estimate a RE panel data model and, given the presence of heteroscedasticity, a GLS model. In addition, each model is estimated considering in isolation each ER. This way, we estimate one model controlling by the official ER and another model controlling by the *blue* ER. Table 4 presents all the estimations with only the variables that at any estimation resulted significant.

Table 4. Estimations of random effects and generalized least squares models

	Random Effects		Generalized Least Squares	
Variables	$y_{i,t}$	$y_{i,t}$	$y_{i,t}$	$y_{i,t}$
x_i^{imp}	0.00254**	0.00254**	0.000565	0.000571
	(0.00106)	(0.00106)	(0.000997)	(0.000996)
x_i^{lw}	0.00108**	0.00108**	0.000415	0.000417
	(0.000492)	(0.000492)	(0.000498)	(0.000496)
x_i^{p-2}	1.63e-05	1.63e-05	0.00253	0.00252
	(0.00174)	(0.00174)	(0.00159)	(0.00159)
x_i^{bra2}	-0.00438***	-0.00438***	-0.00200	-0.00200
	(0.00158)	(0.00158)	(0.00225)	(0.00225)
x_i^{bra3}	0.00416	0.00416	-0.000263	-0.000271
	(0.00380)	(0.00380)	(0.00264)	(0.00262)
x_i^{bra4}	-0.00258***	-0.00258***	-0.00239	-0.00239
	(0.000697)	(0.000697)	(0.00189)	(0.00188)
x_i^{bra5}	-0.00347***	-0.00347***	-0.00266	-0.00266
	(0.00109)	(0.00109)	(0.00189)	(0.00189)
x_i^{bra6}	-0.00684***	-0.00684***	-0.00393*	-0.00393*
	(0.00182)	(0.00182)	(0.00235)	(0.00235)
x_i^{bra7}	-0.00155	-0.00155	-0.00233	-0.00232

	(0.000997)	(0.000997)	(0.00201)	(0.00200)
x_i^{bra8}	-0.00297**	-0.00297**	-0.00274	-0.00274
	(0.00117)	(0.00117)	(0.00197)	(0.00197)
x_i^{bra9}	-0.00455***	-0.00455***	-0.00305	-0.00304
	(0.00157)	(0.00157)	(0.00285)	(0.00283)
x_i^{bra10}	0.00122	0.00122	7.15e-05	6.42e-05
	(0.00193)	(0.00193)	(0.00258)	(0.00256)
x_i^{bra11}	-0.00250*	-0.00250*	-0.00260	-0.00261
	(0.00135)	(0.00135)	(0.00248)	(0.00248)
x_i^{bra12}	-0.00437***	-0.00437***	-0.00269	-0.00269
	(0.00158)	(0.00158)	(0.00263)	(0.00261)
x_i^{bra13}	-0.000826	-0.000826	-0.00195	-0.00195
	(0.000784)	(0.000784)	(0.00288)	(0.00287)
x_i^{var-2}	0.000272**	0.000272**	0.000283	0.000283
	(0.000131)	(0.000131)	(0.00178)	(0.00177)
x_i^{var-4}	0.000950	0.000950	0.00131	0.00130
	(0.000787)	(0.000787)	(0.00103)	(0.00102)
x_i^{g-2}	0.000476**	0.000476**	0.000432	0.000432
	(0.000238)	(0.000238)	(0.00118)	(0.00116)
x_i^{g-3}	-0.00278**	-0.00278**	-0.000547	-0.000551
	(0.00142)	(0.00142)	(0.000730)	(0.000729)
f_t^{s1}	0.00305**	0.00442***	0.000424	0.00117*
	(0.00129)	(0.00140)	(0.000664)	(0.000679)
f_t^{s2}	0.00187	0.00231	-0.000168	0.000163
	(0.00139)	(0.00153)	(0.000627)	(0.000617)
f_t^{s3}	0.00303***	0.00259***	0.00249***	0.00249***
	(0.000762)	(0.000841)	(0.000628)	(0.000633)
f_t^{m12}	0.000921	8.05e-05	-0.000337	0.000107
	(0.00174)	(0.00178)	(0.00104)	(0.00105)
f_t^{m1}	0.00261**	0.00203*	0.00158	0.00213**
	(0.00106)	(0.00116)	(0.00103)	(0.00105)
f_t^{m2}	-0.00205	-0.00322*	-0.00178*	-0.00113
	(0.00125)	(0.00168)	(0.00106)	(0.00109)
f_t^{m3}	0.00139	0.00183	0.000688	0.00227**
	(0.00130)	(0.00141)	(0.00108)	(0.00109)
f_t^{m4}	-0.00715***	-0.00877***	-0.00648***	-0.00624***
	(0.00122)	(0.00201)	(0.00108)	(0.00111)
f_t^{m5}	0.00268*	0.00135	0.00213*	0.00147
	(0.00155)	(0.00184)	(0.00110)	(0.00108)
f_t^{m6}	-0.00290**	-0.00285**	-0.000615	0.000123
	(0.00130)	(0.00141)	(0.00110)	(0.00109)
f_t^{m7}	-0.00463***	-0.00559***	-0.00476***	-0.00441***
	(0.00132)	(0.00171)	(0.00107)	(0.00110)
f_t^{m8}	-0.00301**	-0.00510**	-0.00273**	-0.00340***

	(0.00142)	(0.00210)	(0.00108)	(0.00110)
f_t^{m9}	0.00132	0.000397	-0.00101	-0.000619
	(0.00205)	(0.00221)	(0.00107)	(0.00111)
f_t^{m10}	-0.00419	-0.00651**	-0.00998***	-0.0108***
	(0.00383)	(0.00274)	(0.00107)	(0.00109)
f_t^{y16}	0.00246**	0.00615***	0.00388***	0.0102***
	(0.00124)	(0.00224)	(0.00129)	(0.00116)
f_t^{y17}	0.00147	0.00530**	0.000734	0.00717***
	(0.00135)	(0.00219)	(0.00129)	(0.00116)
f_t^{y18}	0.000764	0.00528***	0.00134	0.00804***
	(0.00105)	(0.00184)	(0.00117)	(0.00109)
f_t^{y19}	0.00271**	0.00415***	0.00444***	0.00674***
	(0.00120)	(0.00153)	(0.000994)	(0.000987)
f_t^{y21}	0.00697***	0.00890***	0.00737***	0.00748***
	(0.00141)	(0.00193)	(0.00144)	(0.00146)
f_t^{lock}	0.0102***	0.0122***	0.00486***	0.00439***
	(0.00318)	(0.00415)	(0.00106)	(0.00124)
$f_t^{fin-ofc-sd}$	-0.00163		-0.00597*	
	(0.00531)		(0.00362)	
$f_t^{fin-ofc-spr}$	-0.00131***		-0.00138***	
	(0.000189)		(0.000209)	
$f_t^{fin-ofc-stdsd}$	-0.000774		-0.000545	
	(0.000477)		(0.000373)	
$f_t^{fin-ofc-qo}$	-7.13e-05		-0.000175***	
	(5.86e-05)		(4.64e-05)	
$f_t^{fin-ofc-ksld}$	-0.000474***		-0.000550***	
	(0.000101)		(6.89e-05)	
$f_t^{fin-ofc-skwsd}$	-0.00167***		-0.00167***	
	(0.000309)		(0.000209)	
$f_t^{cost-oil}$	0.00765	0.0236	0.0159	0.0424***
	(0.0215)	(0.0226)	(0.0128)	(0.0128)
$f_t^{cost-inf}$	0.133*	0.0802	0.207***	0.154***
	(0.0795)	(0.0675)	(0.0389)	(0.0387)
$f_t^{fin-blu-sd}$		0.0253		-0.00909
		(0.0255)		(0.00764)
$f_t^{fin-blu-spr}$		-0.000425		0.000150
		(0.000582)		(0.000192)
$f_t^{fin-blu-stdsd}$		1.85e-05		0.000709***
		(0.000348)		(0.000233)
$f_t^{fin-blu-qo}$		-0.00179**		-0.000621*
		(0.000758)		(0.000332)
$f_t^{fin-blu-ksld}$		0.000555*		0.000419***
		(0.000310)		(9.91e-05)

$f_t^{fin-blu-skwsd}$		-0.00326***		-0.00263***
		(0.000689)		(0.000243)
β_0	0.00661**	0.00934	0.00911**	0.00103
	(0.00320)	(0.00699)	(0.00367)	(0.00388)
Observations	19,656	19,656	19,656	19,656
Items	78	78	78	78

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Brands and firms are mostly overlapped, with the result that estimations excluded most of them from calculus. Accordingly, we only present information on significant brands. Those correlated with a negative rate of price variation in pricing are *5 Hispanos, Bonafide, Cabrales, Durban, Nescafe Caffe Mate*, and *Nescafe Gold* while considering the RE model. Once controlled for heteroscedasticity, only Dunbar maintains its sign. Besides, none brand consistently increased prices beyond average. In terms of other attributes, *imported* advertised brand, *blend* grains, and the package weight are correlated to increasing prices but that might be an estimation biased by heteroscedasticity. On the other hand, *Robusta* grain is associated with quality and the price variation is above average.

Timing in pricing is robustly positive on the 3rd week. This is one week before the end of the month, perhaps preparing new prices for the upcoming month where new wages are paid. The first week might be also be a point in time where prices increase but the evidence may be biased by heteroscedasticity. In terms of seasonality, months of decrease pricing are February, April, July, August, and October. Increasing are observed on January, March, and May. Finally, when observing the year effect, 2016, 2019, 2021 were years of robust positive effect independently of the effect of ER considered. However, 2017 and 2018 are associated also to positive changes in the rate of variation of prices if considered the blue ER as control. Besides this, Argentina suffered one of the stricter and more extensive lockdowns given the SARS-CoV-2 pandemics of 2020 (Larrosa, 2021). The effect on coffee pricing were robustly positive. In terms of costs, gasoline price only presents correlation when controlling by the blue ER, in a way of devaluation expectation affecting coffee pricing. Weekly inflation is, as expected, positively related to tea price changes in the GLS modeling approach.

Finally, variables related to macroeconomic instability are the most significant among all. In terms of ER, variations in the official ER metrics seem to be more significant. While the official and blue exchange variation rates do not show correlation to pricing, the spread between selling and buying official dollar is negatively related to weekly pricing. This gap reveals a differential between supply and demand of the official ER and it may implies that a negative price variation may be required for obtaining short-run liquidity. The same direction is observed in kurtosis and skewness in intra-weekly official ER variations, all pointing towards that a more positive kurtosis (leptokurtic) affects by diminishing the rate of variation in pricing, that is not expected since more positive kurtosis would imply a higher probability of devaluation. The expected case is observed in the blue ER, where kurtosis and pricing are positively related, anticipating that devaluation expectation might induce higher prices. In the case of skewness, both ER behave similarly: a higher skewness implies a higher probability of devaluation and affects pricing positively.

5. Conclusions

Coffee has increased its participation in daily consumption in Argentina. It has struggled with well-established *yerba mate* and locally produced tea in the infusions market. The drink has newer variants and packaging focus on presently exploited segments. In the last five years, brands and attributes have played an important role, but with the general economic instability black market ER have become highly influential in coffee pricing. Seasonal and cycle effects are usually important economic forces behind those decisions too, so they add complexity to that interesting scenario we have described.

Our contribution presents expected evidence on the pass-through effect from ER to prices, but it also shows the relevance of timing and attributes on pricing. We could have used the data for estimating a classical hedonic model, but we would lose the highly important dynamic dimension in such a particular context. By considering cross-section and dynamics we expose relationships that emerge even under turbulent times.

Pricing retail coffee by surfing increasing inflation has revealed a rich topic. Several brands and attributes are associated with significant while not robust negative and positive pricing during the period. The third week emerges as a significant and robust period for increasing prices, perhaps while sellers are waiting for the price updating of the first week in the following month. Next, there is a month cycle longing in the second and third quarter with decreasing prices. Yearly, it is clear that after the profound devaluations of 2018, prices increase in the following periods even during an exceptional period such as the lockdown. Strangely enough, both ER evolution induced negative changes in pricing. However, we observe different effects depending on whether the variations come from official ER or the *blue* ER.

Further analysis will consider how specific presentations, variants, and brands compete under inflation. Do brands compete by using promotions? Do they compete by slowing down price rebinding for appearing cheaper? These questions require proper analysis.

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