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# Relations between coffee world market price and retail price in Belgium

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**Abstract—** The objective of this publication is to analyze how the variations observed at the coffee world market price level pass on the coffee retail price in Belgium. This research takes place in the framework of a coffee value chain analysis. The formation of the coffee price cycles seems to fade these last years at world market as well as retail price in Belgium levels and since the previous months, these prices rise strongly due to the speculators interest for the commodities market. We observe that when the world coffee price diminishes, this reduction passes on the retail coffee price in Belgium less rapidly than for an increase and moreover, the correlation is stronger when the world price grows than during the deceasing periods. We also notice that variability of the world coffee price from 1998 to 2007, which stretches to reduce itself these latter years, is clearly superior to the Belgian coffee retail price one.

**Keywords—** coffee world market price, coffee retail price in Belgium, transmission.

## I. INTRODUCTION

The objective of this publication is to analyze how the variations observed at the coffee world market price level pass on the coffee retail price in Belgium. This research takes place in the framework of a coffee value chain analysis.

## II. MATERIALS AND METHODS

In our analysis, we used the retail coffee price in Belgium, based on the data collection elaborated for the calculation of prices index. Every month, the price of coffee pack (250 g) is collected in representative cities and shops by agents of economics affairs ministry [1]. The world coffee price, namely the International Coffee Organization (ICO) Composite Indicator Price, is daily and monthly calculated from different groups prices (Colombian Milds, other

Milds, Brazilian Naturals and Robustas) according to a precise distribution [2].

We observed the time transmission of the world coffee price variations to the retail coffee price in Belgium and studied the correlation importance between the two prices series with the help of Pearson correlation coefficient. Moreover, we examined the variability of these prices through the coefficient of variation, a common statistic for measuring the variability of a data series [3].

## III. RESULTS AND DISCUSSION

### A. Coffee world market price recent trends

Important changes have occurred in international coffee trade during recent years. The end of the International Coffee Agreement (ICA) in 1989 has done away with the ICO's ability to set a price band [4]. Vietnam has appeared as a new actor in the international market: from 1989 to today, it increased more than tenfold his production, becoming the second largest world producer. At the same time, Brazil had developed new area for coffee production and intensified his production system. Despite the emergence of Vietnam as a coffee power, Brazil continues to dominate the global market.

Previous to 1997, the quantity of world stocks included an important quantity of stocks owned by roasters but after 2000, a bigger part of world stocks had become available due to the outsourcing roasters strategy of stock management and the move of a stock proportion from roasters to traders. Therefore, stocks that are immediately available on the market have increased and the impact of stocks on the international prices appears stronger than before [5].

### B. Coffee world market price cycles

The world coffee price (Fig. 1) is characterized by a cyclic behavior of five to seven years duration with brief volatile periods of high prices and long stable periods of low prices.

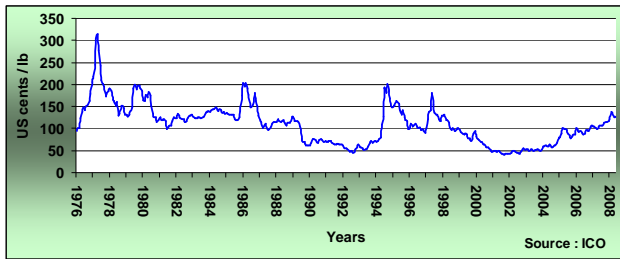


Fig. 1 Monthly ICO Composite Indicator Price

This trend is explained by the fact that falling prices led to a rapid drop in production because producers only gathered the most productive fields, neglected maintenance and even gave up all or part of their coffee plantations. Furthermore, a coffee plantation represents a serious investment and there is a tendency to try and survive a period of low prices rather than to change to other crops [6]. Conversely, when prices are high, the supply cannot immediately respond. Increasing prices led to a rise in supply after a three to five year gap, which resulted from the time taken to set up new coffee plantations or refit those that had been neglected during the low prices periods [7].

Nevertheless, the formation of the coffee price cycles seems to lessen since September 2001 (Fig. 1), when the ICO Composite Indicator Price was at his lowest level with 41.17 US cents/lb. Recent years have been characterized by an increase in coffee price and, since the beginning of this year, this price continues to rise strongly to attain 138.8 US cents/lb in February 2008. While an increase of the coffee price is usually caused by a bad harvest or an important imbalance of demand and supply as described above, this current raising would be the consequence of the speculators interest for the commodities market and their impact on value stocks.

But the depressed prices plaguing coffee growers are not simply the result of a cyclical glut. They are also caused by two systemic changes within the global coffee world: the collapse of the cartel that kept prices as sustainable levels for nearly three decades, and the development of new coffee-processing technology,

which prompted a shift away from high-quality Arabica beans to cheaper, lower-quality Robusta. The roasters, to reduce costs further, have significantly upped the percentage of Robusta in their blends, substituting it for Arabica they once purchased from small farmers in Latin America and Africa [8].

### C. Retail coffee price in Belgium

The retail coffee price in Belgium seems to observe a five to seven years cycle as well, characterized by short and high prices periods with high instability and more consequent low prices periods with clearly least variability (Fig. 2).

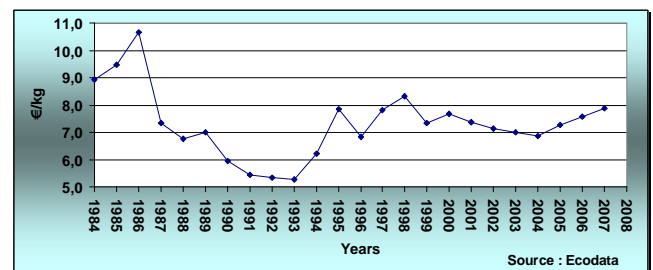


Fig. 2 Annual retail coffee price in Belgium

Actually, while the retail coffee price in Belgium attained 10.67 €/kg in 1986, it collapsed to attain his lowest level in 1993 with 5.26 €/kg, that is to say a 5.41 €/kg decrease. Nevertheless, it would seem that this price cyclic evolution becomes blurred these last years.

The monthly evolution of the Belgian retail price, given from 1998, allows a more precise observation of the price cycles amplitude reduction (Fig. 3). After a 1.55 €/kg decrease from January 1998 to February 2000, the retail coffee price is picked up to the rise but

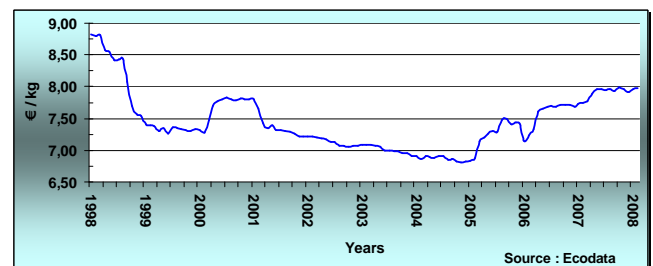


Fig. 3 Monthly retail coffee price in Belgium

from February 2001 to November 2004, it is fallen again to its lowest level at 6.80 €/kg.

Since, it raises in a progressive way to attain 7.96 €/kg in November 2007 while, the preceding years, the coffee retail price increases were observed on short periods followed by longer periods during which the prices diminished.

#### *D. Transmission of the world coffee price variations to the retail price in Belgium*

On the whole, the recorded peaks of the ICO Composite Indicator Price from 1998 to today (Fig. 4 and Table 1) passed on the retail coffee price in Belgium three to five months later. For instance, from September to December 1999, the Composite Indicator Price increased from 23.7 US cents per lb (+ 32.9 %). This rise seems to have passed on the retail coffee price in Belgium from February 2000, that is to say five months later, to July 2000 (+ 0.56 €/kg or + 7.75 %).

At the opposite, when the world coffee price diminishes, the transmission of this reduction to the retail coffee price is done less quickly than for an increase (Fig. 4 and Table 1). Indeed, it passes on with a delay of 8 months to more of a year. For example, the fall observed at the world level from December 1999 to September 2001 (-54.5 US cents per lb or - 56.9 %) seems to be passed 13 months later on the retail price (-0.59 €/kg or -7.52 %), with a stabilization period at a high price level during six months.

We notice equally that the variations, expressed in percentage, of the world coffee price are more important than for the retail price in Belgium.

We also observe clear continuity in the retail price decrease until February 2005 when the world price slightly grows from September 2001 to Augustus 2004 (Fig. 4). Moreover, low decreases recorded at the world price level do not generally pass on the price in Belgium.

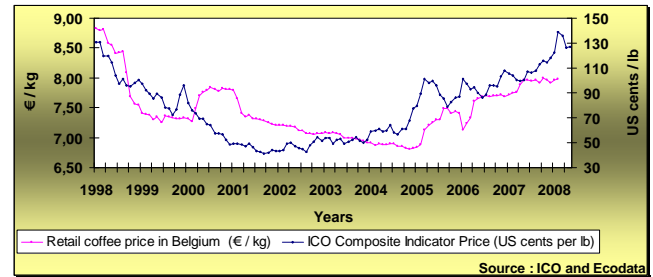


Fig.4 Monthly ICO Composite Indicator Price and Retail coffee price in Belgium

#### *E. Correlation between the world coffee price and the retail price in Belgium*

We notice that correlation between the ICO Composite Indicator Price and the retail coffee price in Belgium is significant ( $r = 0,644$ ) from 1998 to 2008. Nevertheless, the correlation is stronger when the world price rises than during the decreasing periods. Indeed, the correlation is lower ( $r = 0,602$ ) from January 1998 to September 2001, a world price decreasing period, than during the growth world price time ( $r = 0,758$ ) from September 2001 to today. However, [9] do not find robust evidence that coffee prices respond more to increases than to decreases.

Table 1 Increase/decrease periods of ICO Composite Indicator Price and retail coffee price in Belgium and observed time response

	ICO COMPOSITE INDICATOR PRICE			RETAIL COFFEE PRICE IN BELGIUM			TIME RESPONSE
	Periods	Variations		Periods	Variations		
		US cents/lb	%		€/kg	%	
INCREASE	09/1999 - 12/1999	+ 23.7	+ 32.9 %	02/2000 - 07/2000	+ 0.56	+ 7.75 %	5 months
	08/2004 - 03/2005	+ 44.5	+ 78.0 %	11/2004 - 09/2005	+ 0.69	+ 10.1 %	3 months
	09/2005 - 01/2006	+ 22.4	+ 28.4 %	01/2006 - 07/2006	+ 0.56	+ 7.88 %	4 months
DECREASE	12/1999 - 09/2001	- 54.5	- 56.9 %	01/2001 - 12/2001	- 0.59	- 7.52 %	13 months
	03/2005 - 10/2005	- 18.9	- 18.6 %	11/2005 - 01/2006	- 0.30	- 4.02 %	8 months

Source: Author calculation based on ICO and Ecodata data

### F. Variability of the world coffee price and the retail price in Belgium

We note that annual variability of the ICO Composite Indicator Price stretches to reduce itself these latter years (Fig. 5). In fact, coffee price variability is, since 2001, inferior to 10.0 % while it was at 29.3 % in 1989, 38.3 % in 1994 and 15.95 % in 2000.

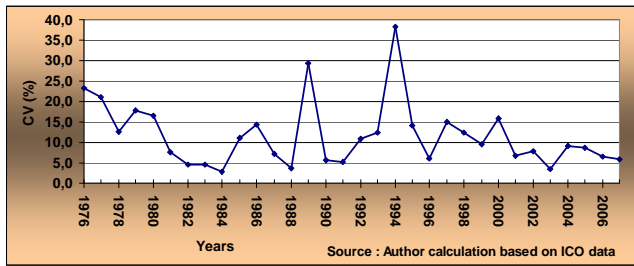


Fig.5 ICO Composite Indicator Price annual variability

Annual variability of the world coffee price from 1998 to 2007 is clearly higher to annual variability of the coffee retail price in Belgium (Fig. 6) which, since 1999, does not surpass the 3.0 %. On the other hand, we do not observe any significant correlation between these two annual variabilities even if they seem to follow a same trend.

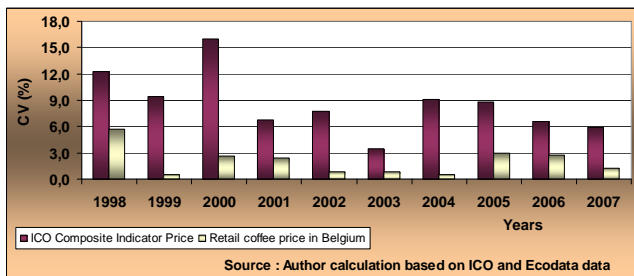


Fig.6 ICO Composite Indicator Price and retail coffee price in Belgium annual variability

## IV. CONCLUSIONS

The formation of the coffee price cycles seems to fade these last years at world market as well as retail price in Belgium levels and since the previous months, these prices rise strongly due to the speculators

interest for the commodities market. We observe that when the world coffee price diminishes, this reduction passes on the retail coffee price in Belgium less rapidly than for an increase and moreover, the correlation is stronger when the world price grows than during the decreasing periods. We also notice that variability of the world coffee price from 1998 to 2007, which stretches to reduce itself these latter years, is clearly superior to the Belgian coffee retail price one.

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