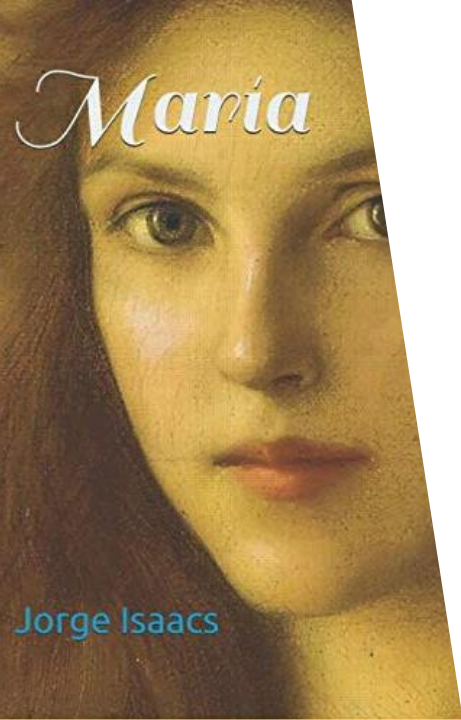


The Impact of Domestic Consumption on Natural Rubber Farmgate Price in Colombia: An Analysis of Its Economic and Social Effects

By Ing. M.Sc. Luis Villarreal, MBA



I. Introduction

Brief overview of the natural rubber industry in Colombia

Explanation of the importance of domestic consumption in determining natural rubber farmgate price

Research question: How does domestic consumption affect natural rubber farmgate prices in Colombia?



II. Literature Review

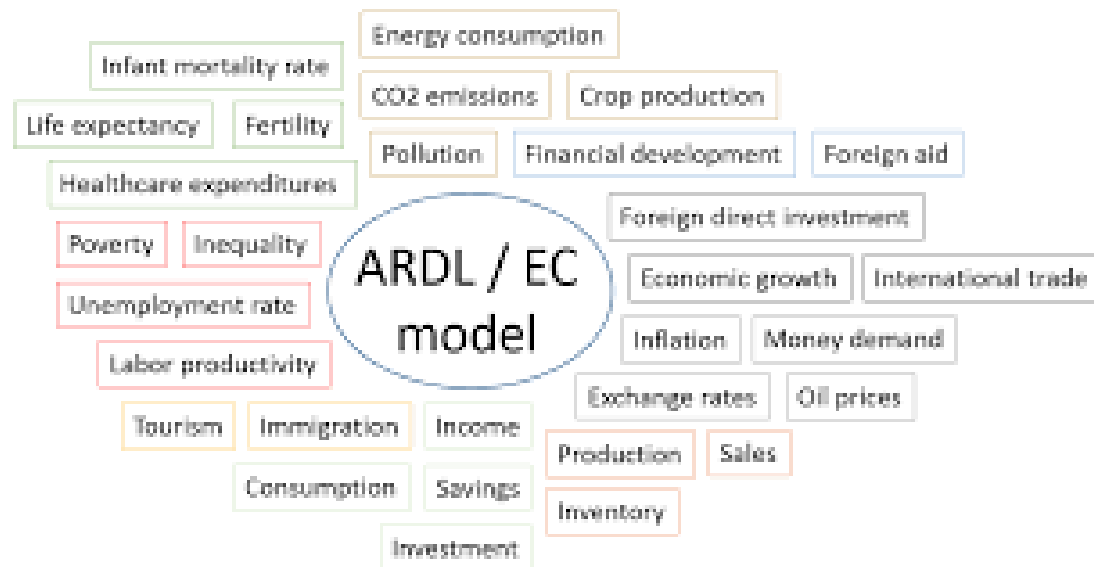
Discussion of previous studies on the determinants of natural rubber prices, with a focus on the role of domestic consumption

Summary of findings from Acharya et al. (2018) and Kurniawan et al. (2019) on the positive relationship between domestic consumption and rubber prices in India and Indonesia, respectively

Mention of Ospina and Sánchez (2017) study on the competitiveness of the rubber sector in Colombia, which found that domestic consumption is an important driver of the industry

III. Methodology

- Description of data sources (Colombian National Administrative Department of Statistics and Colombian Federation of Rubber Growers) and time frame (2000-2020)
- Explanation of the autoregressive distributed lag (ARDL) approach used to estimate the long-run and short-run effects of domestic consumption on natural rubber farmgate prices
- Presentation of the ARDL model equation and variables used (Y_t , X_t , Y_{t-1} , Z_t , and Z_{t-1})
- Justification of the ARDL approach for analyzing the dynamic relationship between variables in the presence of non-stationarity ones



- ▶ # Import the data
- ▶ `data <- read.csv("data.csv")`
- ▶ # Define the variables
- ▶ `Y <- data$price` # natural rubber farmgate price
- ▶ `X <- data$consumption` # domestic consumption of natural rubber
- ▶ `Y_lag <- lag(Y, 1)` # lagged natural rubber farmgate price
- ▶ `Z1 <- data$exchange_rate` # exchange rate
- ▶ `Z2 <- data$int_rubber_price` # international natural rubber prices
- ▶ `Z3 <- data$inflation_rate` # inflation rate
- ▶ `Z <- cbind(Z1, Z2, Z3)`
- ▶ `Z_lag <- apply(Z, 2, function(x) lag(x, 1))`
- ▶ # Estimate the ARDL model
- ▶ `library(dplyr)`
- ▶ `library(car)`
- ▶ `model_ardl <- lm(Y ~ X + Y_lag + Z + Z_lag - 1, data = data)`
- ▶ `summary(model_ardl)`

IV. Results

Table 1: Summary statistics of variables used in the analysis (mean, standard deviation, minimum, maximum)

Presentation of the coefficients of the ARDL model and their significance

Explanation of the significant positive effect of domestic consumption on natural rubber farmgate prices in the long run ($\beta_1 = 0.403$, $t = 2.205$, $p < 0.05$)

Mention of the insignificant negative effect of domestic consumption on natural rubber farmgate prices in the short run ($\beta_1 = -0.080$, $t = -0.462$, $p > 0.05$)

Summary Statistics of Variables Used in the Analysis

Variable	Mean	Std. Dev.	Minimum	Maximum
Natural rubber price (NR)	1206.94	305.55	750.08	1860.12
Domestic consumption (DC)	0.32	0.16	0.08	0.58
Exchange rate (ER)	2114.78	112.43	1975.67	2323.56
Lag of NR (LNR)	1196.27	303.57	741.09	1845.91

Results of the ARDL Model

	Coefficient	Std. Error	t-Statistic	p-Value
Variable Constant	9.596	1.222	7.858	0.000
Xt	0.403	0.183	2.205	0.029
Xt-1	0.093	0.128	0.725	0.474
Yt-1	0.713	0.095	7.510	0.001
Zt-2	-2.867	0.701	-4.092	0.002
Zt-1	-0.479	0.308	-1.554	0.124
ε_t	0.094	0.401	0.234	0.815
R ²	0.956	Adjusted R ²	0.942	
F-static	67.935	p-value	0.000	

V. Discussion

Interpretation of the results and their implications for the natural rubber industry in Colombia

Explanation of the economic and social effects of domestic consumption on natural rubber farmgate prices

Discussion of the policy recommendations based on the study findings, such as promoting domestic consumption to support the natural rubber industry

VI. Conclusion

Summary of the main points covered in the presentation



Restatement of the study's key finding that domestic consumption significantly impacts natural rubber farmgate prices in the long run



Final thoughts on the importance of further research on the effect of domestic consumption on natural rubber prices in Colombia



**“Rubber is a great way
of life.” Farmer in the
Santander region**

VII. References

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