

# Wage and Price Setting: New Evidence from Uruguayan Firms

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Seventh BIS CCA Research Conference - Lima - May 2016

- The opinions expressed in this document are the sole responsibility of the authors and do not compromise nor represent the position of the Central Bank of Uruguay

# Outline

- Introduction - motivation
- The survey
- Price setting behavior
- Factors affecting pricing
- Prices and wages
- Firms reaction to unexpected shocks
- Final comments and future research

# Introduction

- In recent years there has been a large increase in the empirical literature on price behavior
- Understanding the microstructure of price setting is key to fight price rigidity and conduct a more efficient monetary and macroeconomic policy
- Few studies that analyze price setting from surveys that directly ask companies regarding price formation (New Zealand, US, Brazil,....)
- Different results from firm's surveys (Coibion, Gorodnichenko and Kumar 2015)

# Introduction

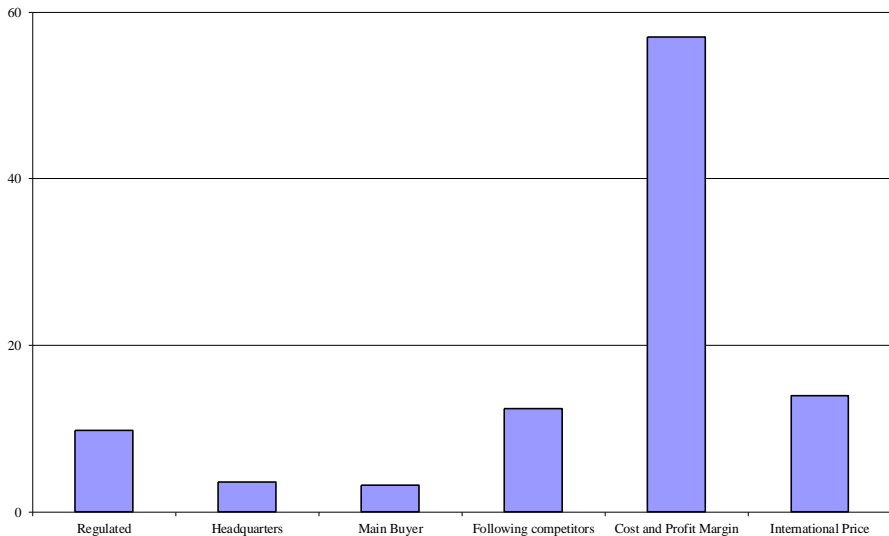
- In Uruguay despite recent progress for the retail sector there is no direct evidence on the price formation strategies by firms
- In this study we use a novel data set of a survey to +300 large Uruguayan firms on price setting

## The survey

- Stratified random sample
- Firms with 50 or more employees
- Strata:
  - *firm's size*: 50 to 99, 100 to 199 and 200+ employes
  - *sector*: all less agriculture. Industry (50%), Trade (15%), Trans. (12%), Other business (9%)
- Sample size: 630. Response rate: 58% (363)

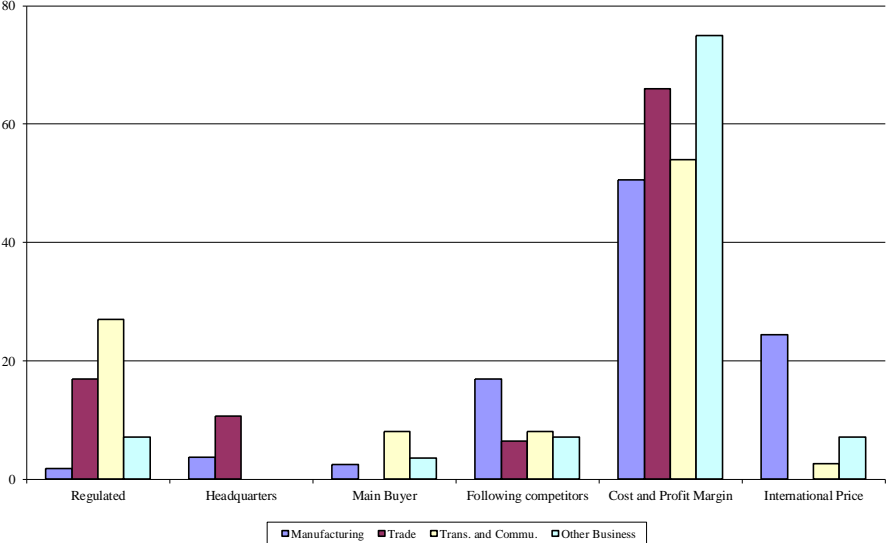
# Price Setting Behavior I

Figure 2a. Pricing of the Firm's Main Product (in %)



# Price Setting Behavior II – by Sector

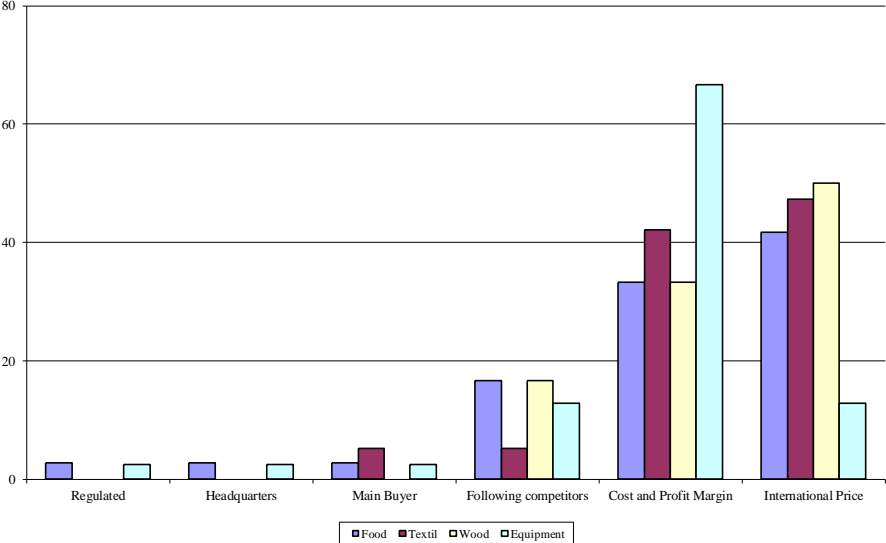
Figure 2b. Pricing of Firm's Main Product by Sector (in %)



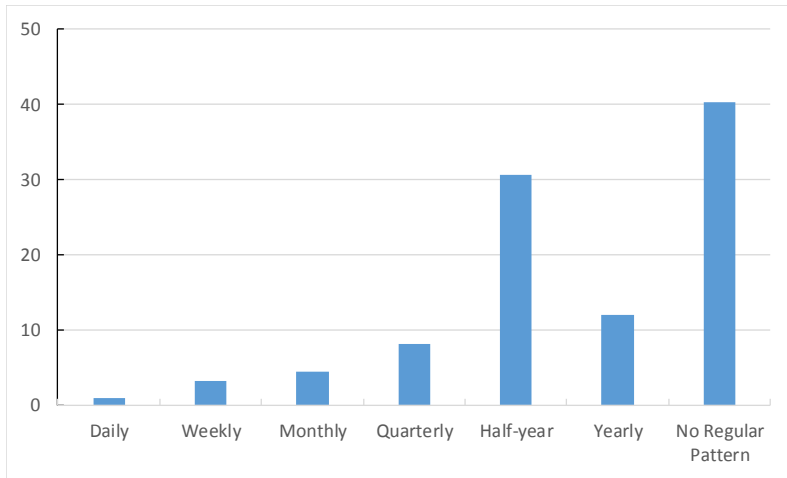


# Price Setting Behavior III – Industry

Figure 2c. Price Setting in the Manufacturing Industry by Subsector (in %)

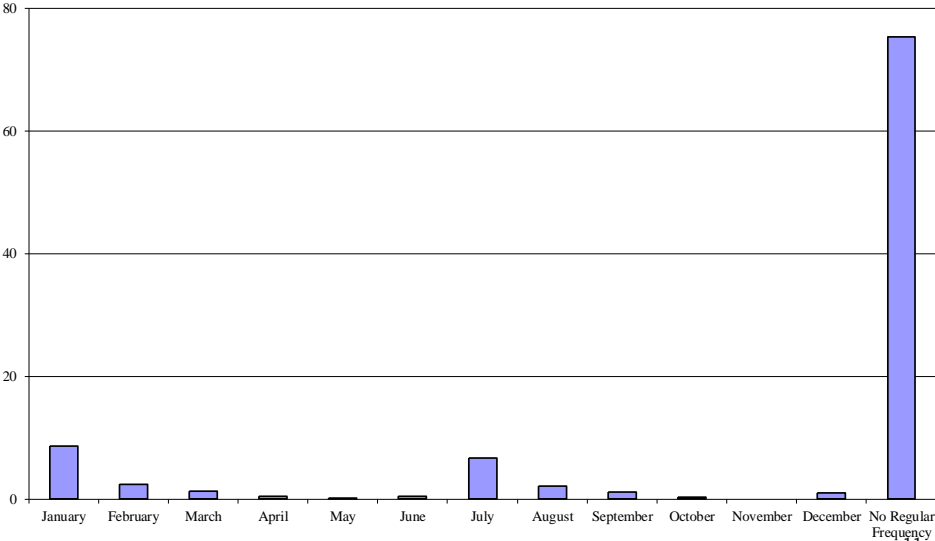


## Price Setting Behavior IV – Frequency of Price Changes



# Price Setting Behavior V – Frequency of Price Changes

Figure 5. Price Changes by Month (in %)

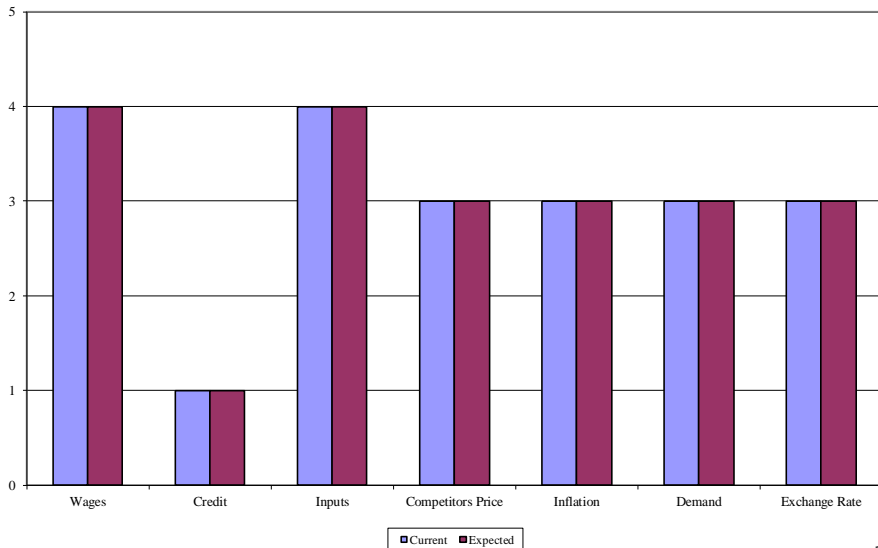


## Price Setting Behavior – Summary

- The majority of firms, regardless of sector, set their price with a mark-up over costs
- The lower response to competition in the food sector shows compared to wood is puzzling. Might be related to market segmentation in some strategically important food components (and/or government intervention)
- Prices are more rigid than in previous studies

# Factors Affecting Pricing I

Figure 6. Factors Affecting Price Increases (median response) 1=Not Relevant, 5=Very Relevant



## Factors Affecting Pricing II

**Table 3. Correlation of True Cost Structure and the Importance Declared by Employers of each Cost Factor**

|              | Wages    | Wages Share | Inputs | Inputs Share |
|--------------|----------|-------------|--------|--------------|
| Wages        | 1        |             |        |              |
| Wages Share  | 0.21***  | 1           |        |              |
| Inputs       | 0.54***  | 0.14***     | 1      |              |
| Inputs Share | -0.27*** | -0.66***    | -0.03  | 1            |
| *** p<0.01   |          |             |        |              |

## Factors Affecting Pricing III

- Temporal orientation of firm  $i$  in factor  $z$  in sector  $j$ :

$$\boxed{to_{z,i,j} = z_{i,j}^f - z_{i,j}^p} \quad (1) \quad (f=\text{future}, p=\text{past})$$

- $to_{z,i,j} > 0 \Rightarrow$  the firm is forward looking in factor  $z$
- $to_{z,i,j} < 0 \Rightarrow$  the firm is backward looking in factor  $z$
- $to_{z,i,j} = 0 \Rightarrow$  the firm is neutral in factor  $z$

## Factors Affecting Pricing IV

- Temporal orientation of firms:

$$to_{i,j} = \sum_{z=1}^7 to_{z,i,j} \quad (2)$$

- Sectoral aggregates:

$$to_{z,j} = \sum_{i=1}^N to_{z,i,j} \quad (3)$$

$$to_j = \sum_{z=1}^7 to_{z,j} \quad (4)$$

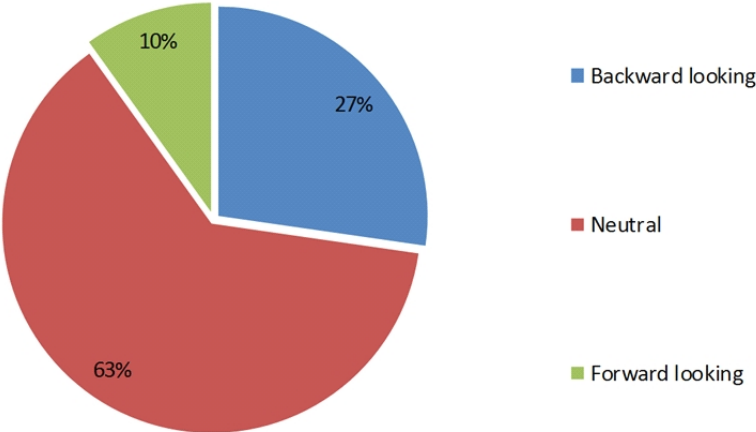
- Total aggregate:

$$to = \sum_{j=1}^{N_j} to_j \quad (5)$$



# Factors Affecting Pricing V

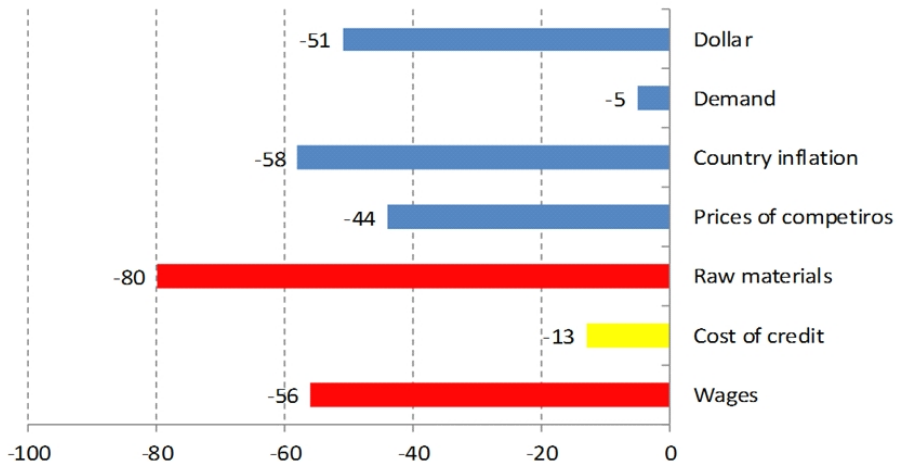
Temporal orientation of firms in the price setting process



Source: Price setting survey (INE).

# Factors Affecting Pricing VI

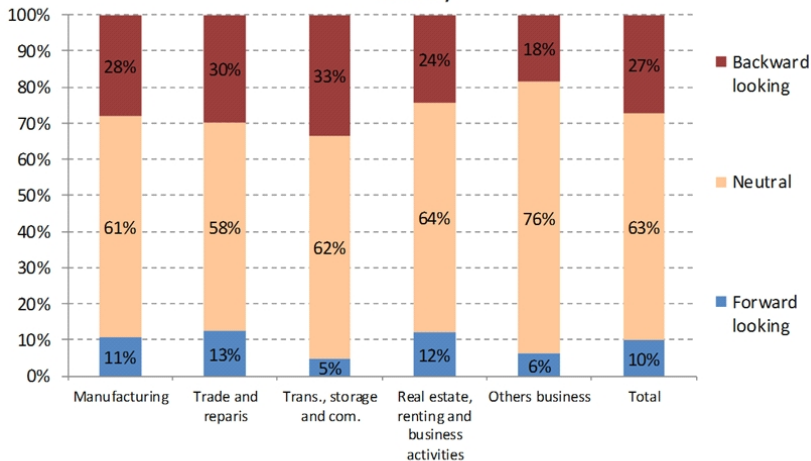
Aggregated temporal orientation by variable



Source: Price setting survey (INE) .

# Factors Affecting Pricing VII

Temporal orientation of firms in the price setting process by sector (ISIC Rev. 3.1)



Source: Price setting survey (INE).

# Factors Affecting Pricing VIII

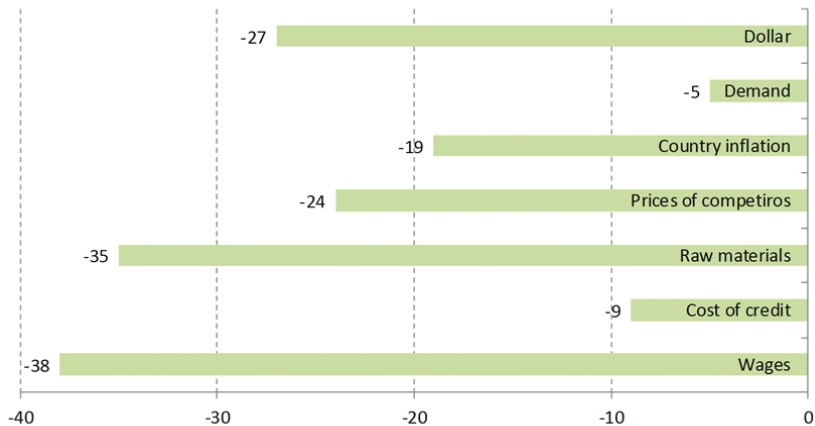
Relative temporal orientation of firms in the price setting process by sector  
(ISIC Rev. 3.1)



Source: Price setting survey (INE).

# Factors Affecting Pricing IX

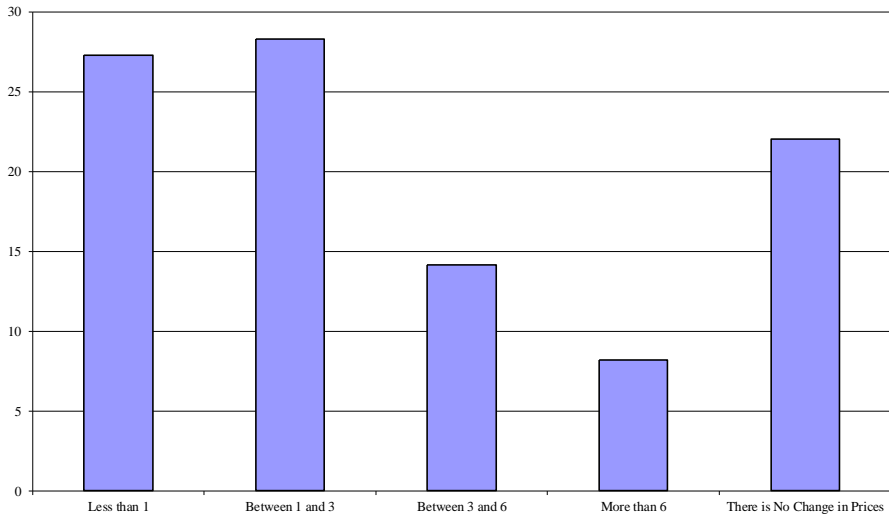
Temporal orientation of firms in the Manufacturing sector by variable



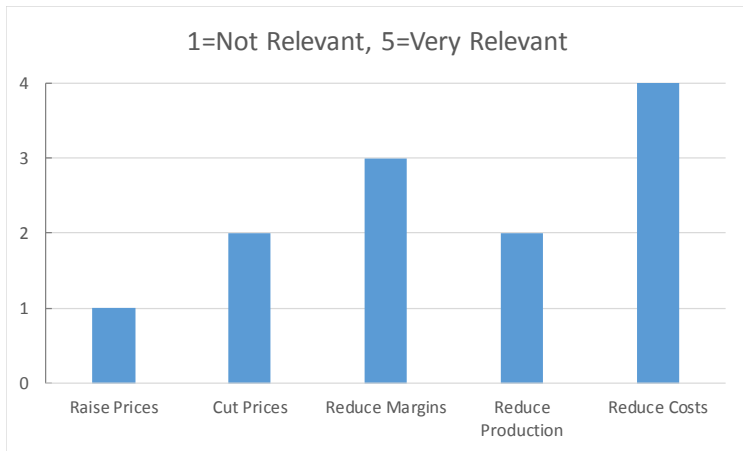
Source: Price setting survey (INE).

# Prices and Wages

**Figure 10. Months to Adjust Prices when Wages Change  
(In %)**



# Firms Reaction to Unexpected Shocks



## Firms Reaction to Unexpected Shocks

**Table 4. Correlation of Firms Strategies under a Sales Negative Shock**

|                   | Raise Prices | Cut Prices | Reduce Margins | Reduce Production | Reduce Costs |
|-------------------|--------------|------------|----------------|-------------------|--------------|
| Raise Prices      | 1            |            |                |                   |              |
| Cut Prices        | 0.22***      | 1          |                |                   |              |
| Reduce Margins    | 0.00         | 0.38***    | 1              |                   |              |
| Reduce Production | 0.04         | 0.27***    | 0.11***        | 1                 |              |
| Reduce Costs      | 0.01         | -0.02      | 0.16***        | 0.15***           | 1            |
| *** p<0.01        |              |            |                |                   |              |



## Final Comments and Future Research

- The results indicate that prices are more rigid than previously thought and indicate a relative low degree of competition in the markets
- 10% of the firms at the aggregate level are forward looking
- Some of the results cast doubt on the responses of the firms. Some answers turned on an alert signal on the analysis of firm's surveys. The design of the surveys should capture these contradictions in the answers
- Factors causing price stickiness?