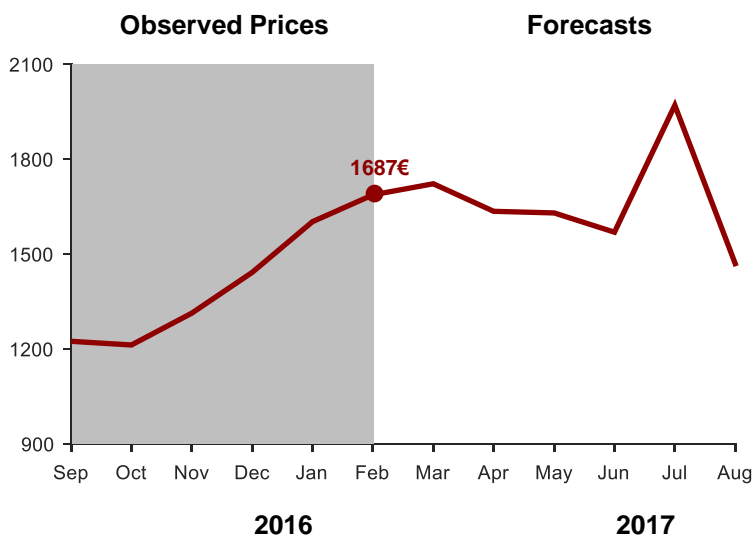


# Forecasting the Price of ABS

<b>Commodity</b>	ABS (Asia Spot CFR)
<b>Forecast Period</b>	March 2017 – August 2017
<b>Currency</b>	€
<b>Unit</b>	Metric Tonne
<b>Observations</b>	Monthly forecasts of the spot price in the first day of the month



## Forecasts



Month/Year	Forecast	Prob. Of Raise
Mar. 2017	1722€	53%
Abr. 2017	1635€	35%
Mai. 2017	1630€	48%
Jun. 2017	1569€	39%
Jul. 2017	1970€	51%
Aug. 2017	1470€	28%

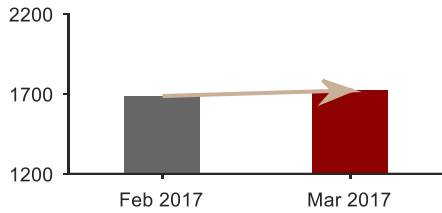
## Suggested Action for Procurement

Purchase Limit Month	Suggested Action
March 2017	Buy in February at 1687€
April 2017	Buy part of requirements
May 2017	Wait
June 2017	Wait
July 2017	Buy part of requirements
August 2017	Buy part of requirements

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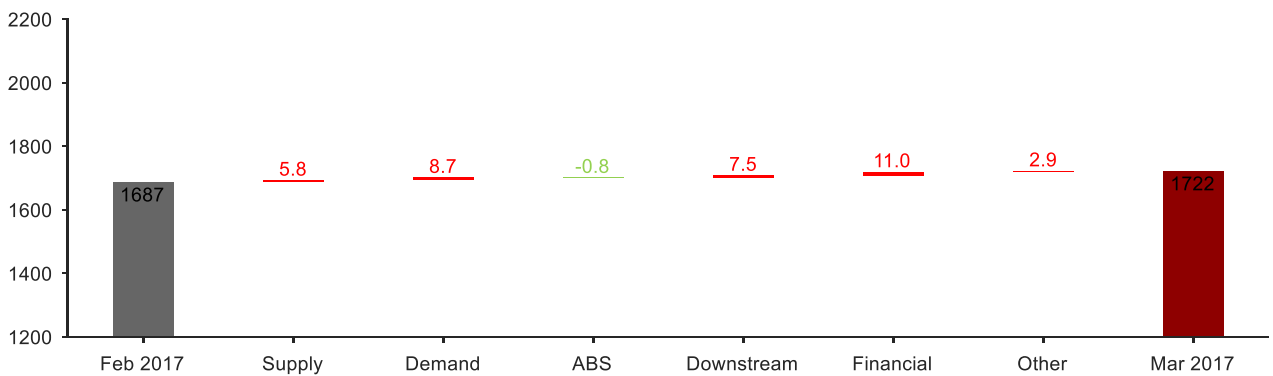
# Forecasting the Price of ABS

## Impact Analysis: One Month Forecast



Our algorithm forecasts a higher price of ABS in one month: it is expectable that the price increases 2,07% from 1687€ to 1722€ until the beginning of March.

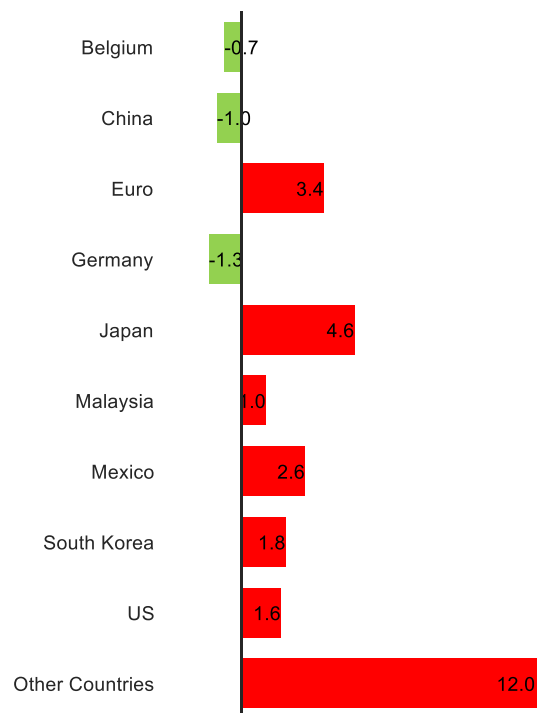
## Indices of Factors



### Interpretation

- **Decrease of Supply:** Positive pressure of the Supply index
- **Increase of Demand:** Positive pressure of the Demand index
- Slightly negative pressure of the index of ABS
- Positive pressure of the index of variables representing the market downstream
- Positive pressure of the financial index
- Positive pressure of other commodities and other factors
- Focus on Japan, Italy, and Turkey

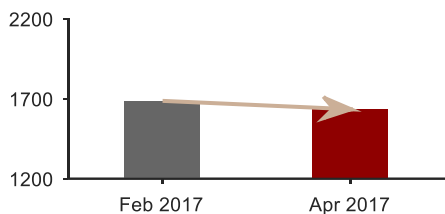
### Impact per Country



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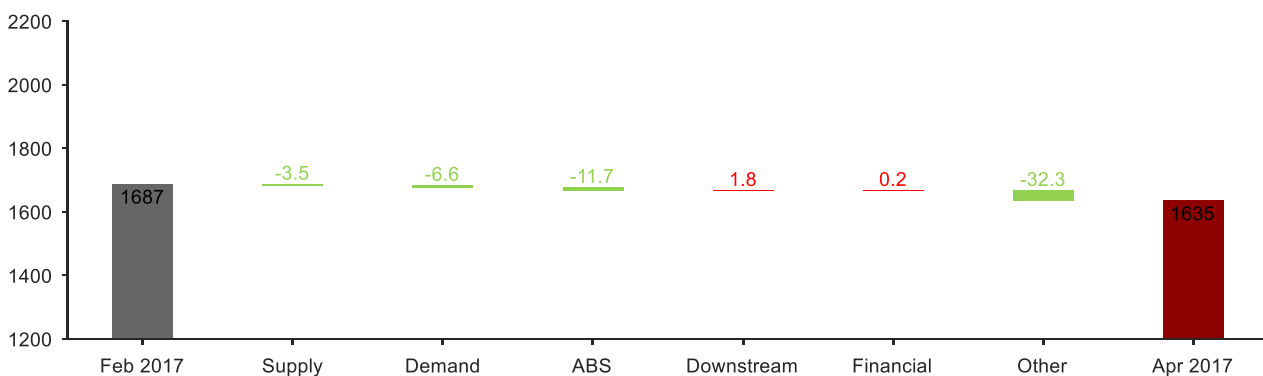
# Forecasting the Price of ABS

## Impact Analysis: Two Months Forecast



Our algorithm forecasts a lower price of ABS in two months: it is expected that the price decreases 3,09% from 1687€ to 1635€ until the beginning of April.

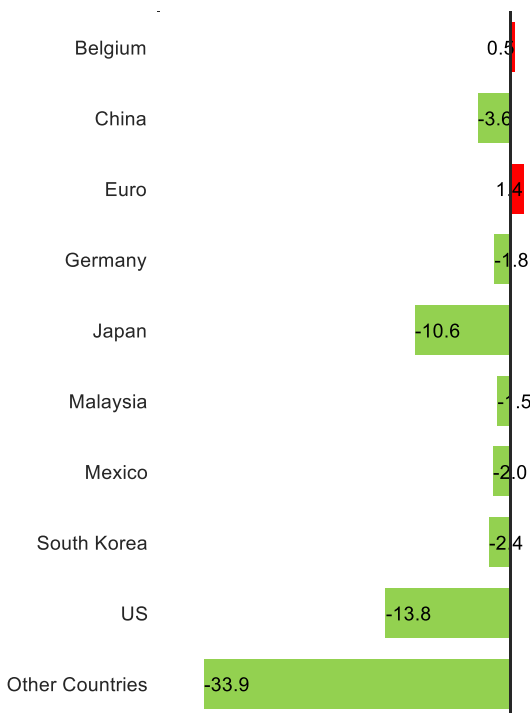
## Indices of Factors



### Interpretation

- **Increase of Supply:** Negative pressure of the Supply index
- **Decrease of Demand:** Negative pressure of the Demand index
- Negative pressure of the index of ABS
- Slightly positive pressure of the index of variables representing the market downstream
- Slightly positive pressure of the financial index
- **Considerably negative pressure of other commodities and other factors**
- Focus on US, Japan, and Thailand

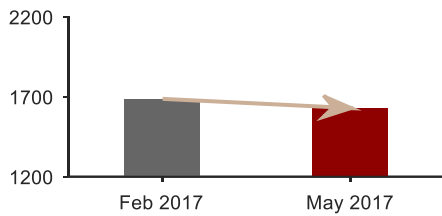
### Impact per Country



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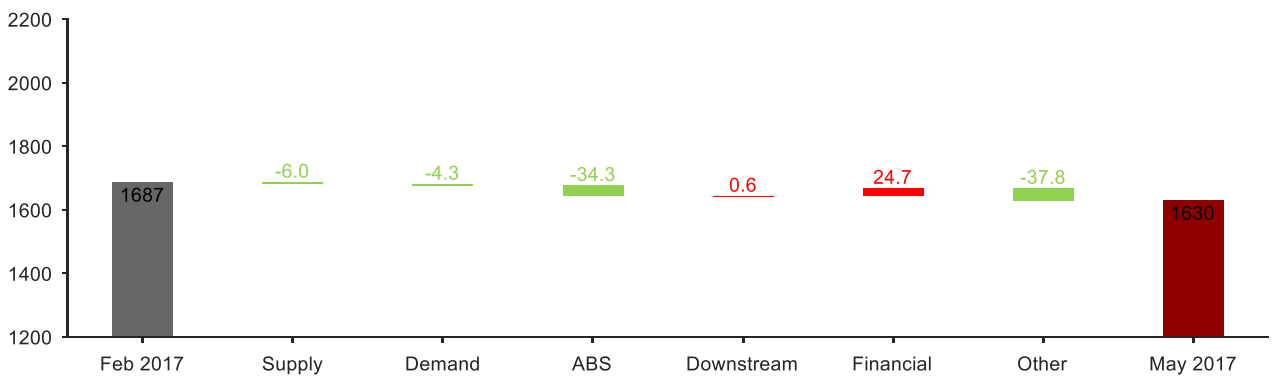
# Forecasting the Price of ABS

## Impact Analysis: Three Months Forecast



Our algorithm forecasts a lower price of ABS in three months: it is expected that the price decreases 3,38% from 1687€ to 1630€ until the beginning of May.

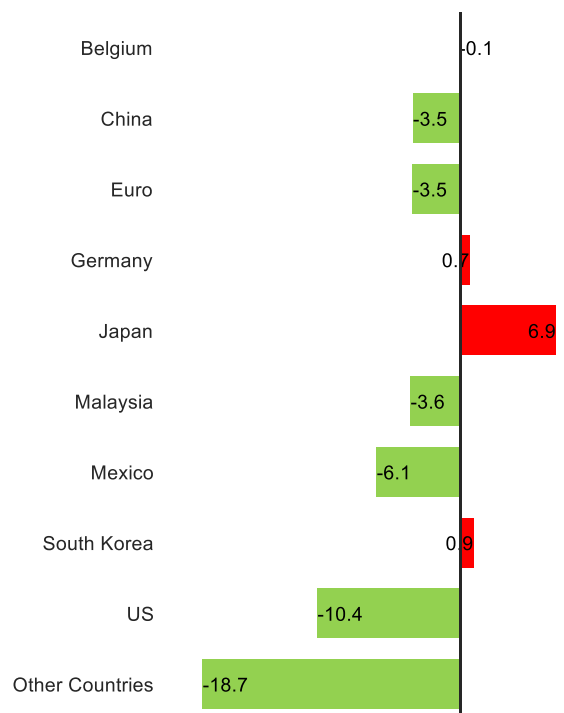
## Indices of Factors



### Interpretation

- **Increase of Supply:** Negative pressure of the Supply index
- Slight decrease of Demand: Negative pressure of the Demand index
- **Considerably negative pressure of the index of ABS**
- Slightly positive pressure of the index of variables representing the market downstream
- Positive pressure of the financial index
- **Considerably negative pressure of other commodities and other factors**
- Focus on US, Japan, and Mexico

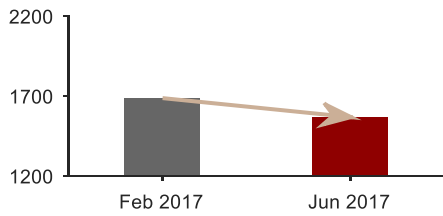
### Impact per Country



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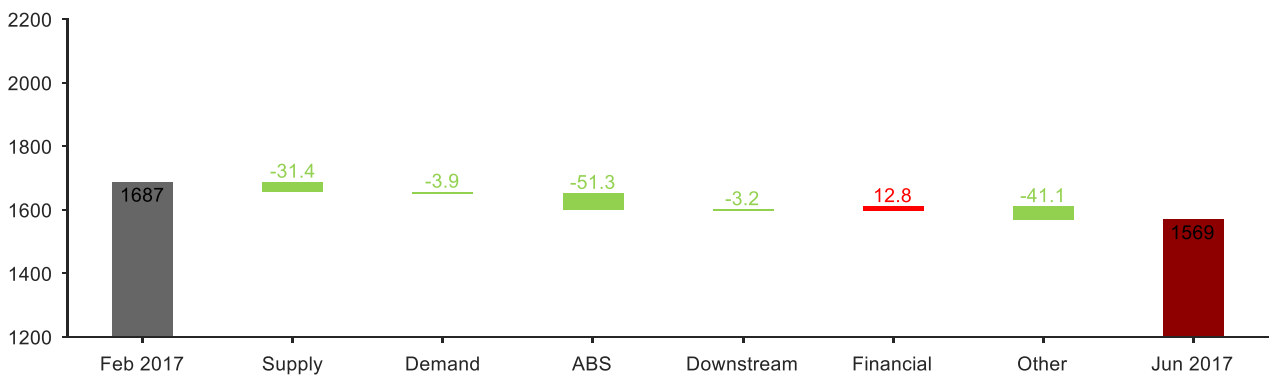
# Forecasting the Price of ABS

## Impact Analysis: Four Months Forecast



Our algorithm forecasts a lower price of ABS in four months: it is expected that the price decreases 6,99% from 1687€ to 1569€ until the beginning of June.

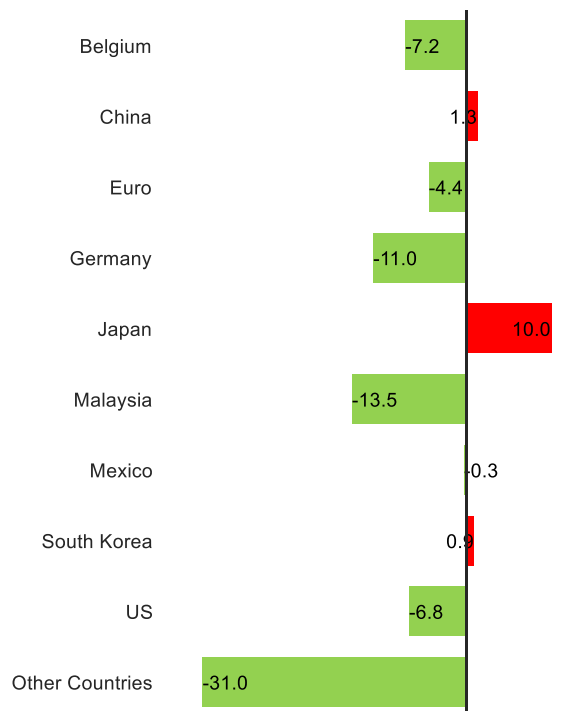
## Indices of Factors



### Interpretation

- **Considerable increase of Supply:** Negative pressure of the Supply index
- Slight decrease of Demand: Negative pressure of the Demand index
- **Considerably negative pressure of the index of ABS**
- Slightly negative pressure of the index of variables representing the market downstream
- Positive pressure of the financial index
- **Considerably negative pressure of other commodities and other factors**
- Focus on Malaysia, Germany, and Italy

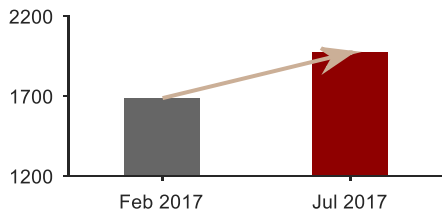
### Impact per Country



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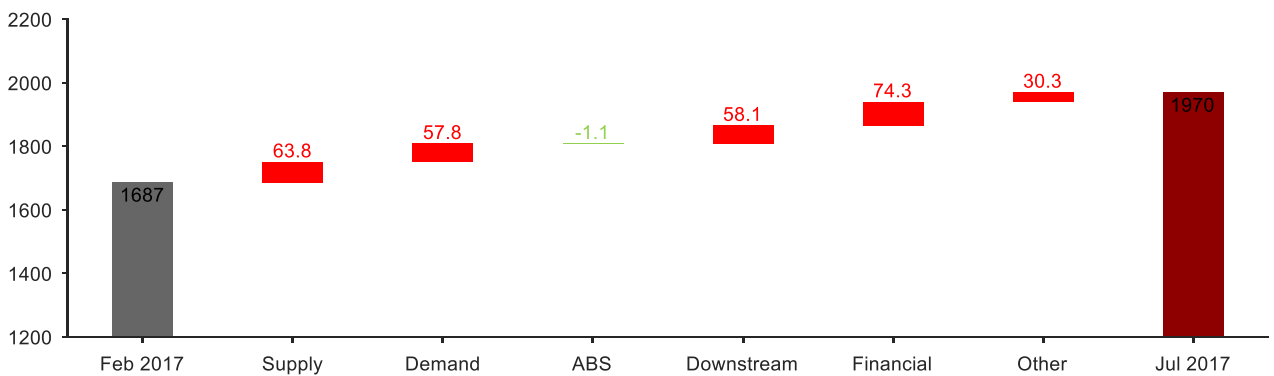
# Forecasting the Price of ABS

## Impact Analysis: Five Months Forecast



Our algorithm forecasts a higher price of ABS in five months: it is expected that the price increases 16,78% from 1687€ to 1970€ until the beginning of July.

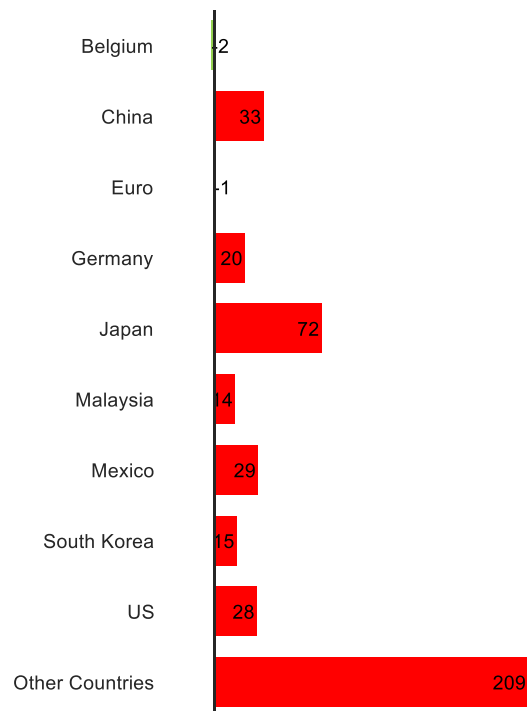
## Indices of Factors



### Interpretation

- **Considerable decrease of Supply:** Positive pressure of the Supply index
- **Considerable increase of Demand:** Positive pressure of the Demand index
- Slightly negative pressure of the index of ABS
- **Considerably positive pressure of the index of variables representing the market downstream**
- **Considerably positive pressure of the financial index**
- **Considerably positive pressure of other commodities and other factors**
- Focus on Japan, Netherlands, and India

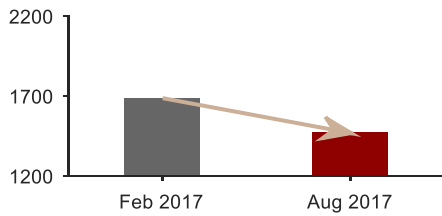
### Impact per Country



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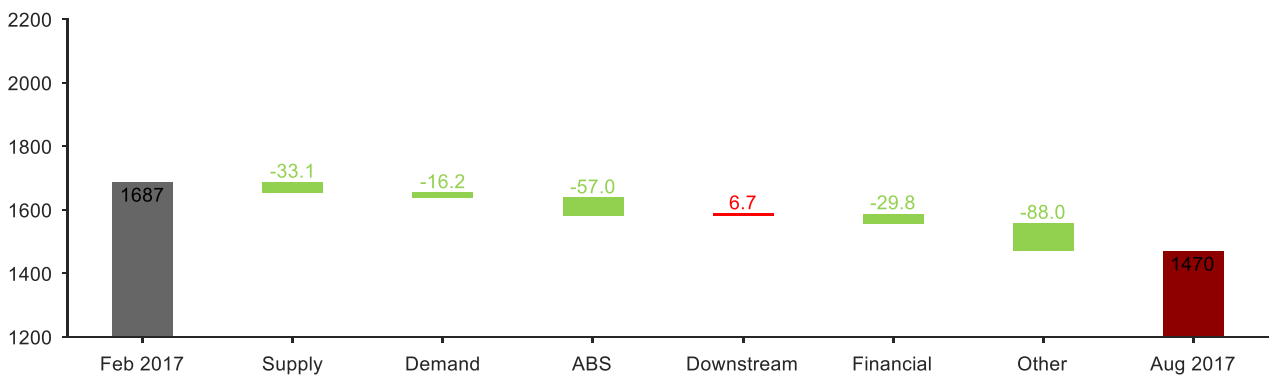
# Forecasting the Price of ABS

## Impact Analysis: Six Months Forecast



Our algorithm forecasts a lower price of ABS in six months: it is expectable that the price decreases 12,88% from 1687€ to 1470€ until the beginning of August.

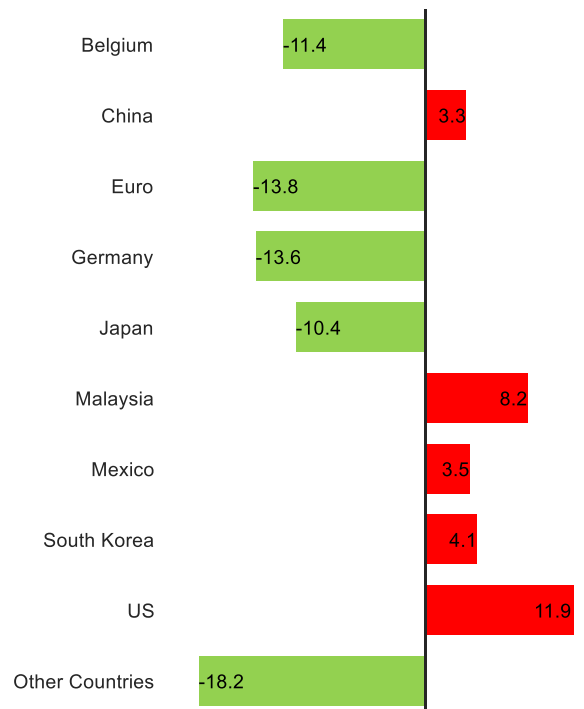
## Indices of Factors



### Interpretation

- **Considerable increase of Supply:** Negative pressure of the Supply index
- **Decrease of Demand:** Negative pressure of the Demand index
- **Considerably negative pressure of the index of ABS**
- Slightly positive pressure of the index of variables representing the market downstream
- **Considerably negative pressure of the financial index**
- **Considerably negative pressure of other commodities and other factors**
- Focus on Spain, Italy, and Euro

### Impact per Country



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# Forecasting the Price of ABS

## APPENDIX I – Technical Explanation of the Impact Analysis

In this appendix, we explain the impact analysis of the factors that most contribute for our forecasts.

This Impact Analysis is conducted individually for **each time horizon**, allowing for a distinction between the indices of variables that contribute for our forecasts at short and medium run.

For each time horizon, our analysis has **two components**: first, we present the impact of variables grouped by **indices of factors**; second we present the impact of variables grouped by **indices of countries**.

### Indices of Factors

**Indices of factors** are indices of the weighted contributions of the variables grouped in those factors.

**Supply Index**: composed of macroeconomic variables of the producing and exporting countries. It includes variables such as production, exchange rates, inflation, monetary policy, and wages. For example, an increase in wages implies higher production costs which should (in linear, general, and *ceteris paribus* terms) generate an incentive to increase prices;

**Demand index**: composed of macroeconomic variables of the consuming and importing countries. It includes variables such as production, exchange rates, inflation, monetary policy, and wages. For example, a decrease in a consumer confidence index should (in linear, general, and *ceteris paribus* terms) increase savings and decrease demand, leading to lower prices;

**ABS Index**: composed of variables related to ABS. It includes variables such as the price of ABS in different regions of the world and exports, imports, and producer prices of ABS in some countries. It also includes the price and microeconomic variables of Butadiene and Styrene. For example, an increase in the price of ABS in other region may imply an increase in the price of ABS in Europe due to arbitrage movements;

**Downstream index**: composed of variables related to downstream industries, such as Packaging, Construction and Electronics. It includes variables such as the exports, imports, and producer prices of the Plastic Industry in some countries. For example, an increase in the demand of Plastic should (in linear, general, and *ceteris paribus* terms) generate an increase in the price of Polypropylene;



# Forecasting the Price of ABS

## APPENDIX – Technical Explanation of the Impact Analysis

**Financial Variables Index:** composed of financial market variables. It includes the share price of companies that produce ABS. It also includes financial indices related to this sector. For example, a positive change in the share price of a ABS producer should (in linear, general, and *ceteris paribus* terms) imply an increase in expected profitability of the firm. This may signal an expectation of increase in the price of ABS;

**Other Variables Index:** composed of variables related to other commodities, such as Oil and Polystyrene. It includes the price, exports and imports of these commodities. For example, a positive change in the price of a substitute commodity, should (in linear, general, and *ceteris paribus* terms) imply an increase of demand of ABS, and thus, of the price of ABS.

## Country Indices

**Country Indices** are indices of the weighted contributions of the macroeconomic variables of each country. The countries we present are the most relevant countries in the production, consumption, and international commerce of ABS.

## Interpretation Warning

It is important to note that the contribution of individual variables and indices of variables is not linear. The interaction between variables and between variables of different factors may not be neglectable, which means that the importance of each variable and indices of variables is determined together with the importance of all other variables.

Furthermore, the analysis of changes in variables is not linear. This means that the same variable with the same change in different moments of time may have different impacts given its previous evolution. For example, the algorithm contrasts the change in a variable with its expected change. A positive change but inferior to the expected change may originate an effect of price correction.