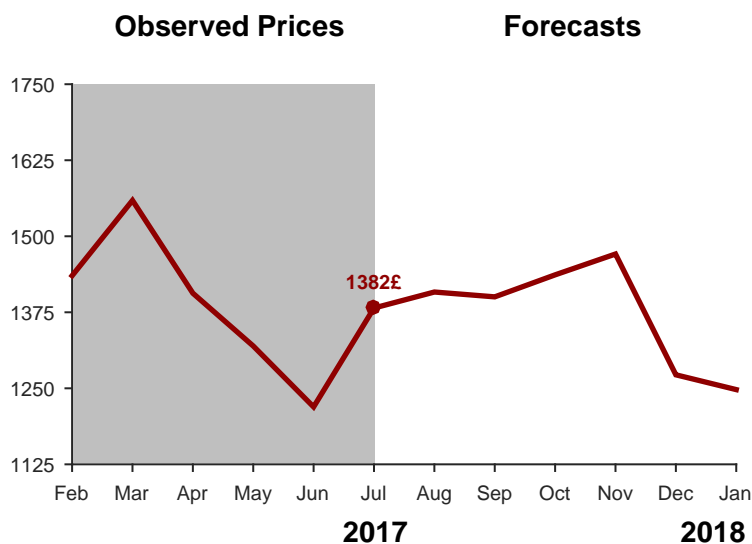


# Forecasting the Price of ABS

|                        |   |
|------------------------|---|
| <b>Commodity</b>       | ABS (Asia Spot CFR)   |
| <b>Forecast Period</b> | August 2017 – January 2018  |
| <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 |
|------------|----------|----------------|
| Aug. 2017  | 1408£    | 64 %           |
| Sep. 2017  | 1400£    | 54 %           |
| Oct. 2017  | 1437£    | 50 %           |
| Nov. 2017  | 1471£    | 66 %           |
| Dec. 2017  | 1272£    | 44 %           |
| Jan. 2018  | 1248£    | 48 %           |

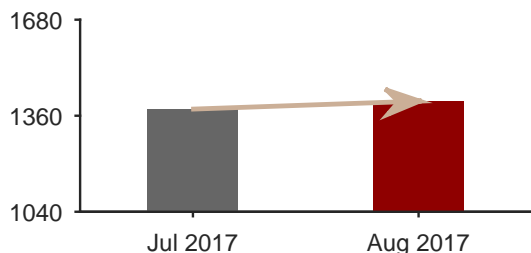
## Suggested Action for Procurement

| Purchase Limit Month | Suggested Action         |
|----------------------|--------------------------|
| August 2017          | Buy in July at 1382£     |
| September 2017       | Buy in July at 1382£     |
| October 2017         | Buy in July at 1382£     |
| November 2017        | Buy in July at 1382£     |
| December 2017        | Buy part of requirements |
| January 2018         | Buy part of requirements |

Disclaimer: This document was made for commercial purposes. All the contents of this document should be of the reader's consideration, so that none of the suggested actions represent incentives to act. Watson & Noble does not take responsibility for actions based on this document.

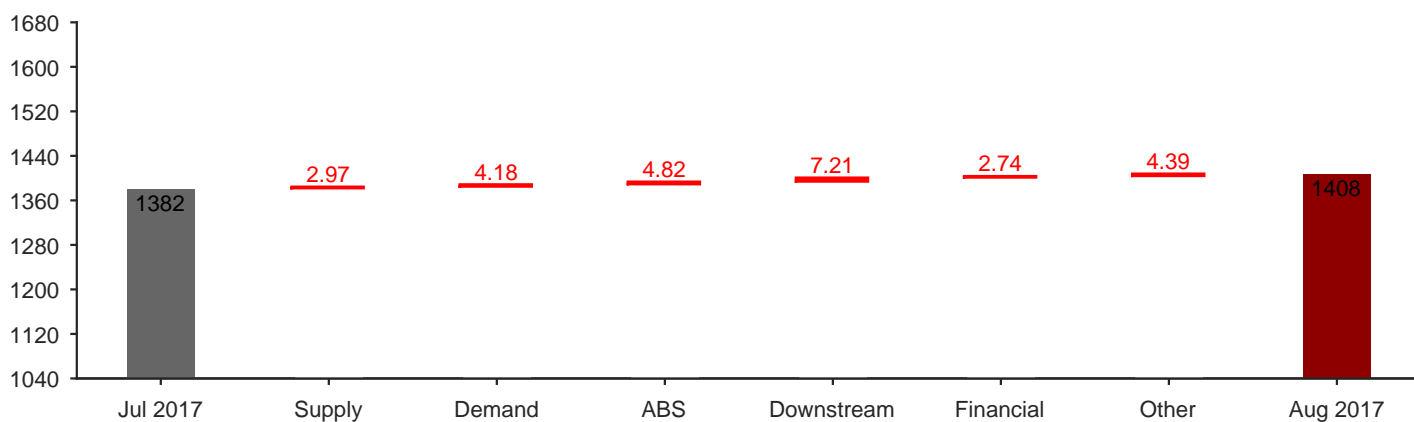
# Forecasting the Price of ABS

## Impact Analysis: One Month Forecast



Our algorithm forecasts a higher price of ABS in one month: it is expectable that the price increases 1.90% from 1382£ to 1408£ until the beginning of August.

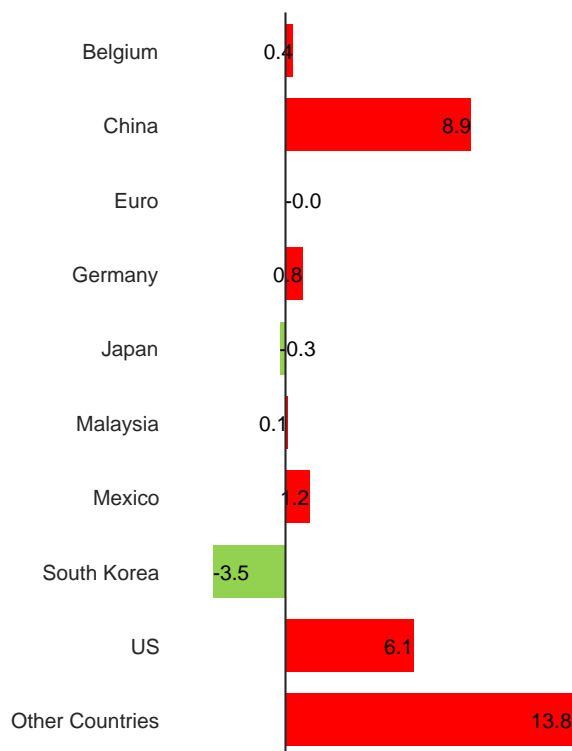
## Indices of Factors



### Interpretation

- **Decrease of Supply:** Positive pressure of the Supply index
- **Increase of Demand:** Positive pressure of the Demand index
- Positive 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 China, US, and South Korea

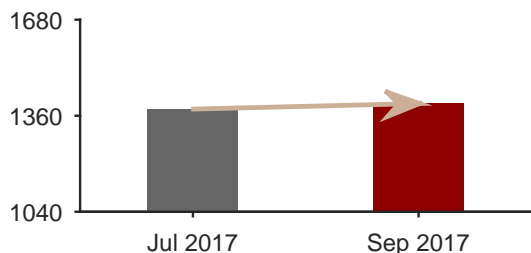
### Impact per Country



Disclaimer: This document was made for commercial purposes. All the contents of this document should be of the reader's consideration, so that none of the suggested actions represent incentives to act. Watson & Noble does not take responsibility for actions based on this document.

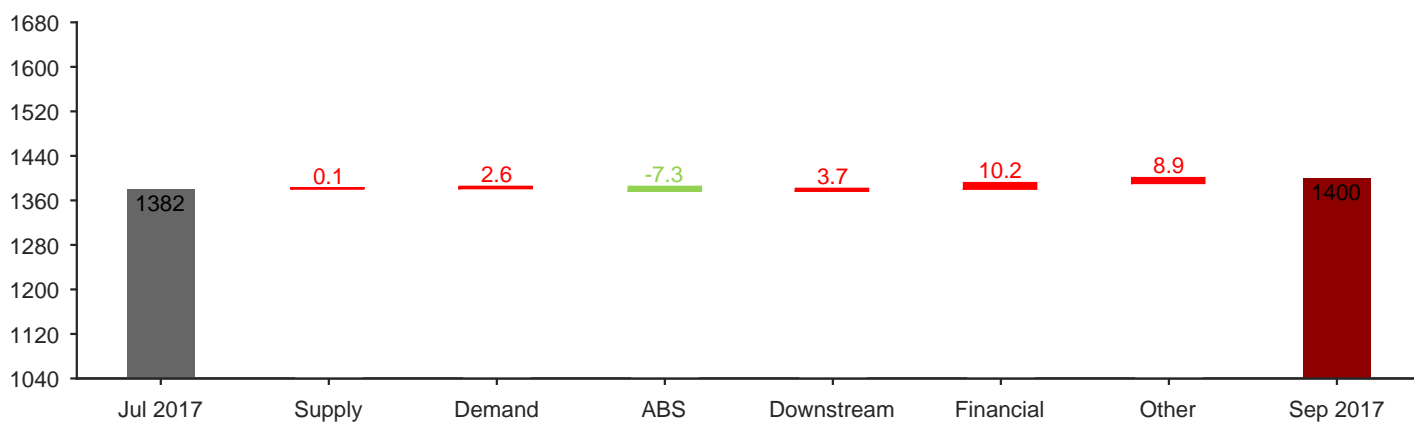
# Forecasting the Price of ABS

## Impact Analysis: Two Months Forecast



Our algorithm forecasts a higher price of ABS in two months: it is expectable that the price increases 1.32% from 1382£ to 1400£ until the beginning of September.

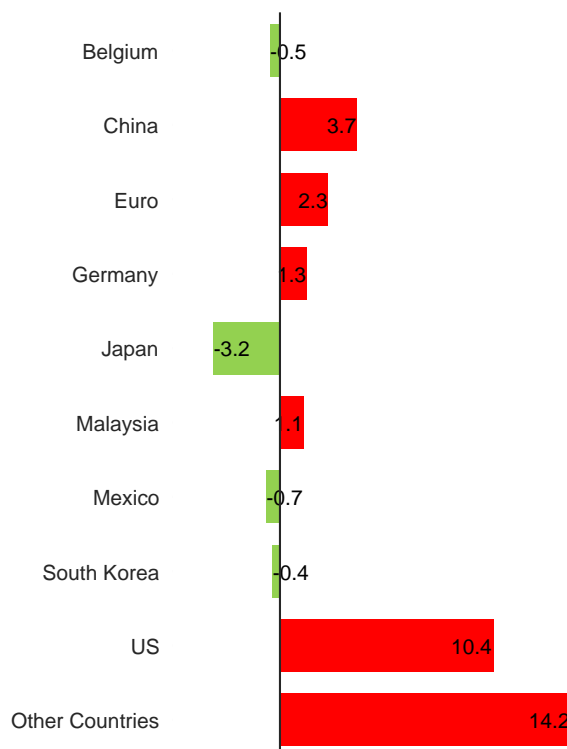
## Indices of Factors



### Interpretation

- Slight decrease of Supply: Positive pressure of the Supply index
- **Increase of Demand:** Positive pressure of the Demand index
- 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 US, India, and China

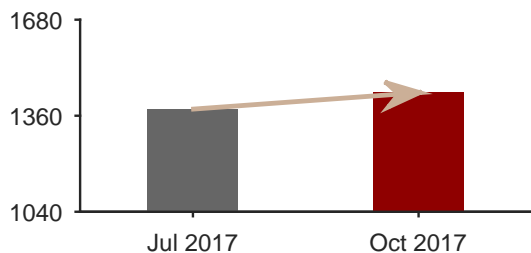
### Impact per Country



Disclaimer: This document was made for commercial purposes. All the contents of this document should be of the reader's consideration, so that none of the suggested actions represent incentives to act. Watson & Noble does not take responsibility for actions based on this document.

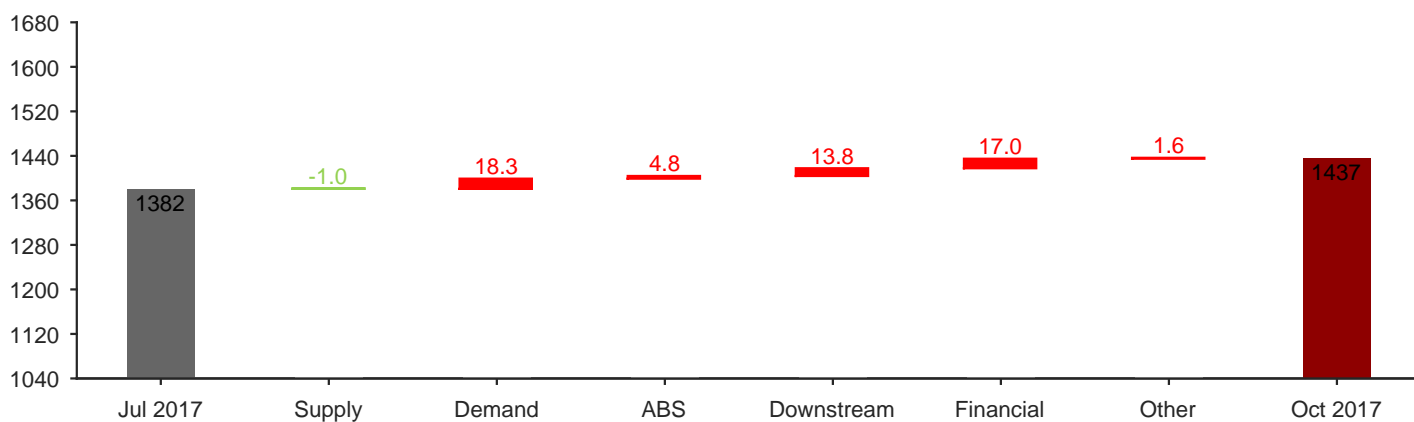
# Forecasting the Price of ABS

## Impact Analysis: Three Months Forecast



Our algorithm forecasts a higher price of ABS in three months: it is expectable that the price increases 3.94% from 1382£ to 1437£ until the beginning of October.

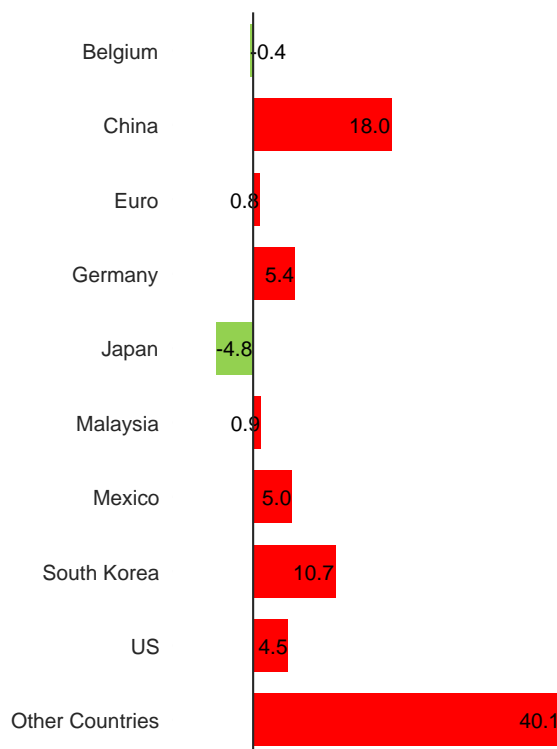
## Indices of Factors



### Interpretation

- Slight increase of Supply: Negative pressure of the Supply index
- **Increase of Demand:** Positive pressure of the Demand index
- Positive pressure of the index of ABS
- Positive pressure of the index of variables representing the market downstream
- Positive pressure of the financial index
- Slightly positive pressure of other commodities and other factors
- Focus on China, South Korea, and India

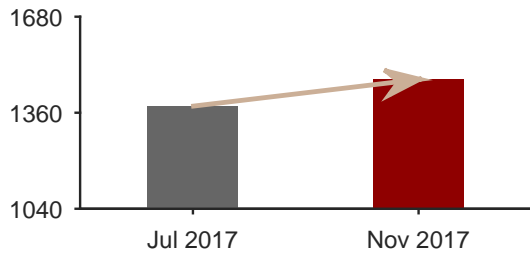
### Impact per Country



Disclaimer: This document was made for commercial purposes. All the contents of this document should be of the reader's consideration, so that none of the suggested actions represent incentives to act. Watson & Noble does not take responsibility for actions based on this document.

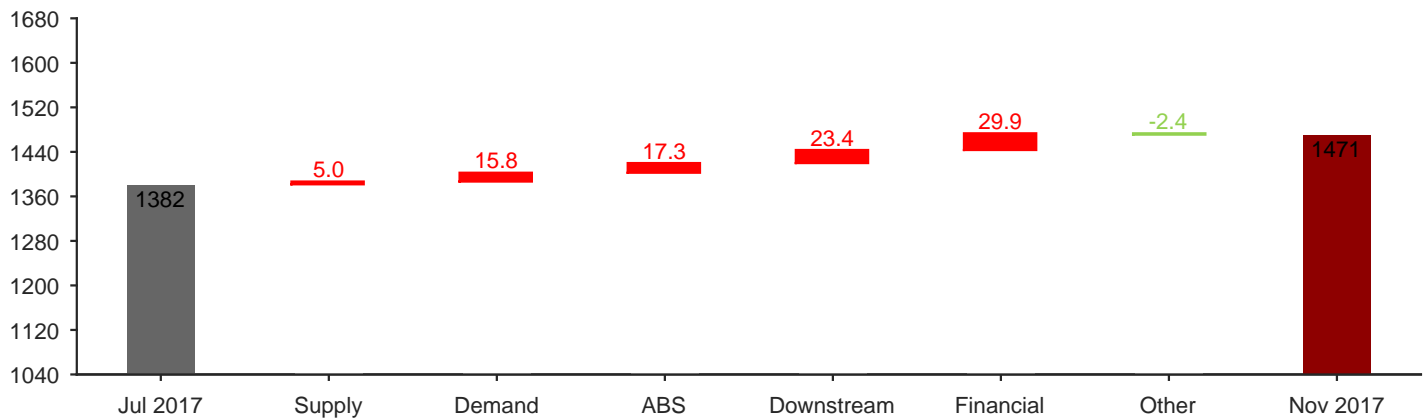
# Forecasting the Price of ABS

## Impact Analysis: Four Months Forecast



Our algorithm forecasts a higher price of ABS in four months: it is expectable that the price increases 6.42% from 1382£ to 1471£ until the beginning of November.

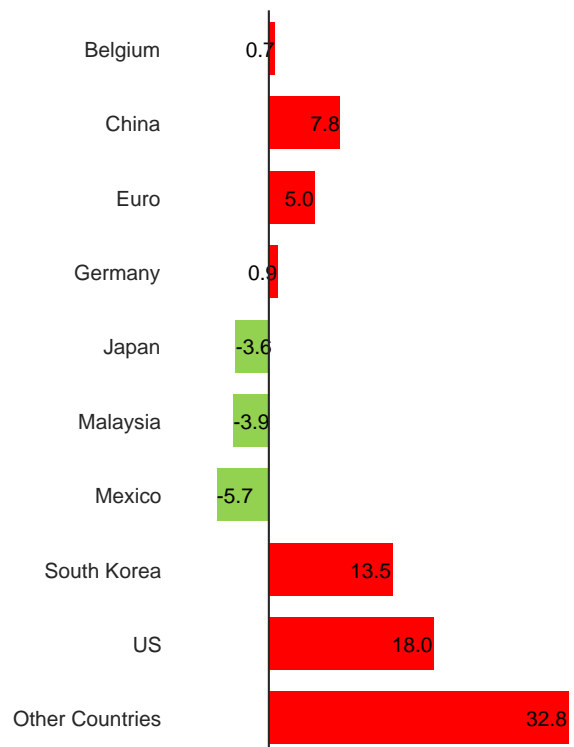
## Indices of Factors



### Interpretation

- **Decrease of Supply:** Positive pressure of the Supply index
- **Increase of Demand:** Positive pressure of the Demand index
- Positive 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**
- Slightly negative pressure of other commodities and other factors
- Focus on US, South Korea, and India

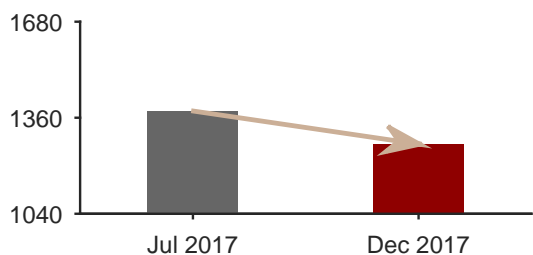
### Impact per Country



Disclaimer: This document was made for commercial purposes. All the contents of this document should be of the reader's consideration, so that none of the suggested actions represent incentives to act. Watson & Noble does not take responsibility for actions based on this document.

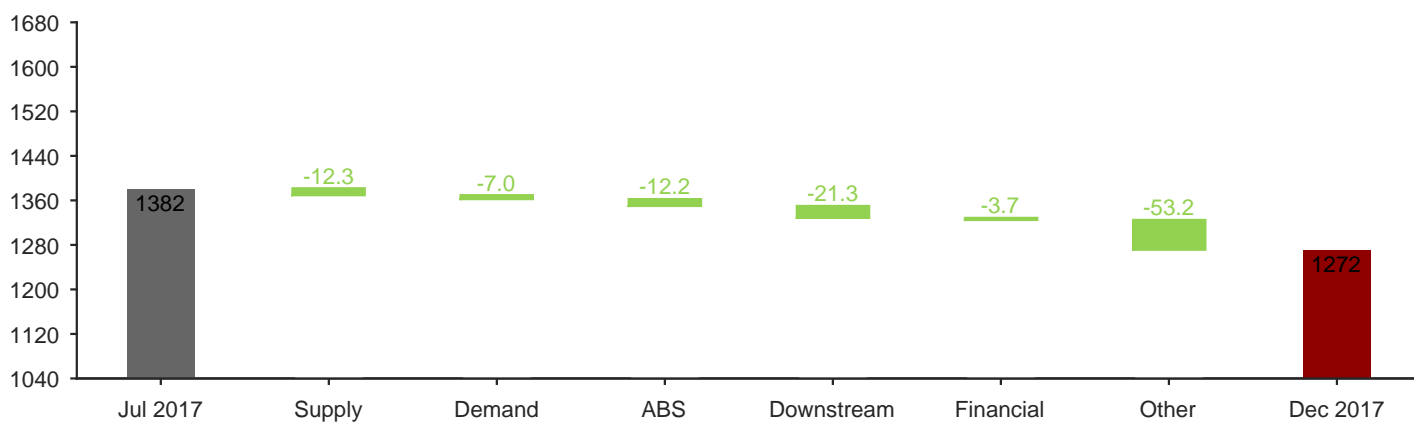
# Forecasting the Price of ABS

## Impact Analysis: Five Months Forecast



Our algorithm forecasts a lower price of ABS in five months: it is expectable that the price decreases 7.94% from 1382£ to 1272£ until the beginning of December.

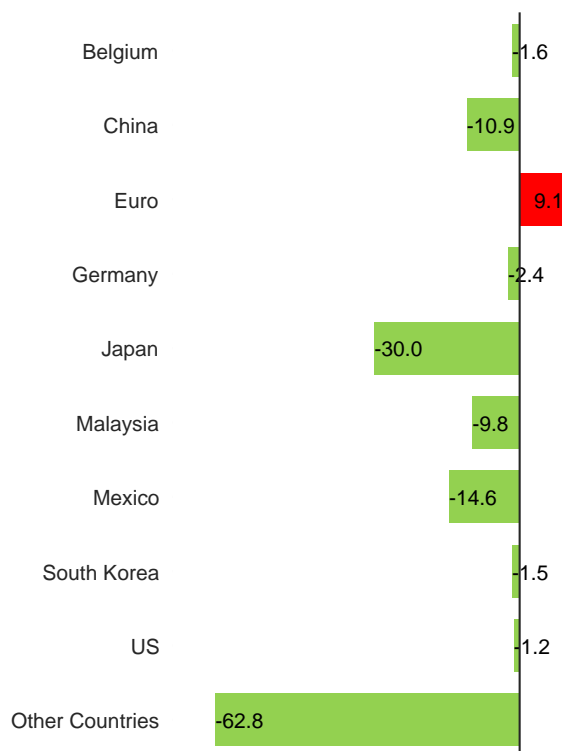
## Indices of Factors



### 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
- **Considerably negative pressure of the index of variables representing the market downstream**
- Slightly negative pressure of the financial index
- **Considerably negative pressure of other commodities and other factors**
- Focus on Japan, Mexico, and Indonesia

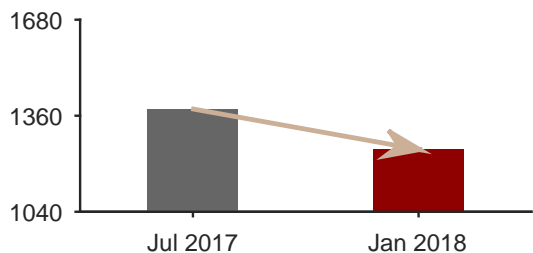
### Impact per Country



Disclaimer: This document was made for commercial purposes. All the contents of this document should be of the reader's consideration, so that none of the suggested actions represent incentives to act. Watson & Noble does not take responsibility for actions based on this document.

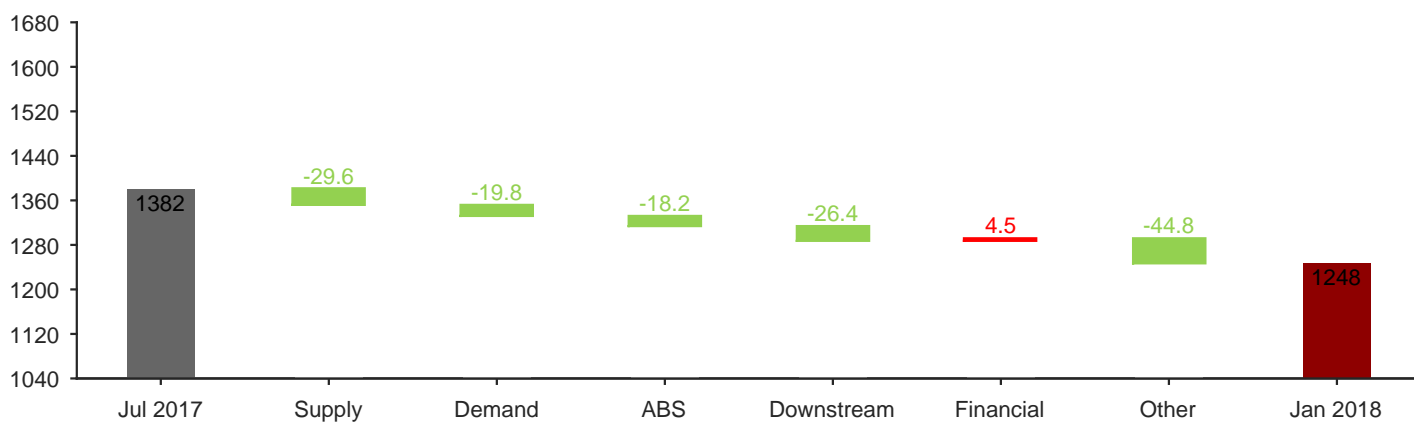
# Forecasting the Price of ABS

## Impact Analysis: Six Months Forecast



Our algorithm forecasts a lower price of ABS in six months: it is expectable that the price decreases 9.70% from 1382£ to 1248£ until the beginning of January.

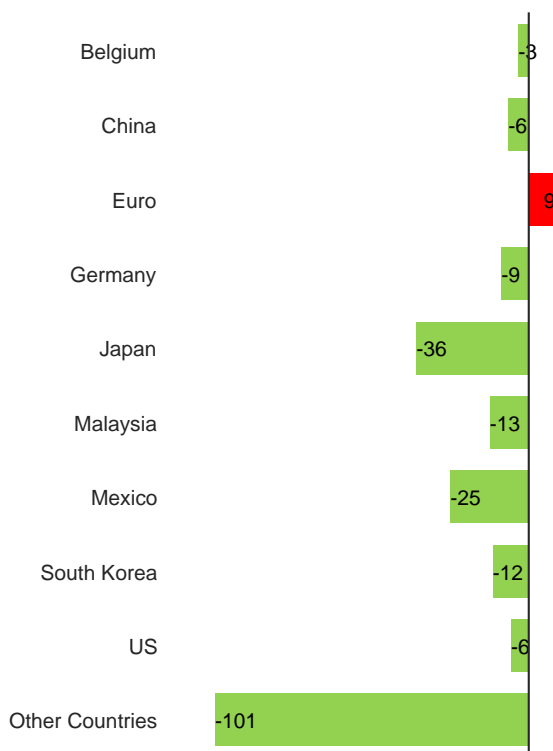
## Indices of Factors



### Interpretation

- **Considerable 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
- **Considerably negative 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 Japan, Mexico, and Malaysia

### Impact per Country



Disclaimer: This document was made for commercial purposes. All the contents of this document should be of the reader's consideration, so that none of the suggested actions represent incentives to act. Watson & Noble does not take responsibility for actions based on this document.

# Forecasting the Price of ABS

## APPENDIX – 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 Plastic, Packaging, Construction, and Electronics. It includes variables such as the exports, imports, and producer prices of these industries 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 ABS;



# Forecasting the Price of ABS

## APPENDIX – Technical Explanation of the Impact Analysis (II)

**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 producer of ABS 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 other polymers. 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.

## Indices of Countries

**Indices of Countries:** 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.