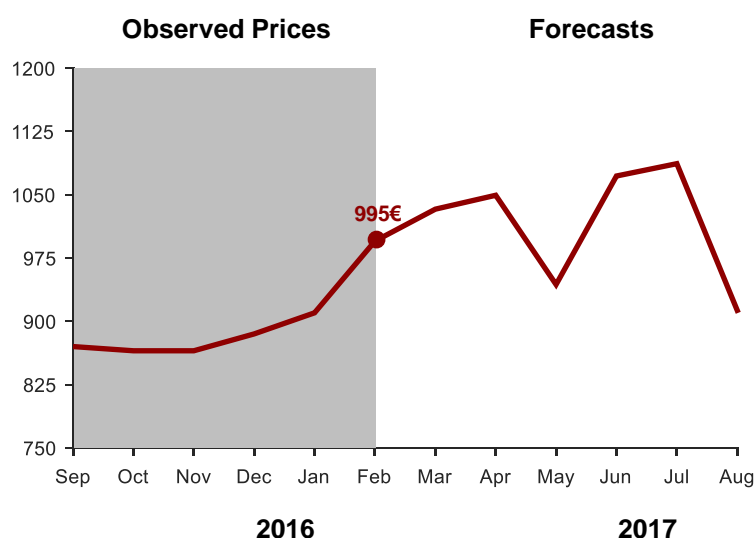


Forecasting the Price of PET

| | |
|------------------------|---|
| Commodity | PET Bottlegde (Spot FD W Europe) |
| Forecast Period | March 2017 – August 2017 |
| Currency | € |
| Unit | Metric Tonne |
| Observations | Monthly forecasts of the spot price in the first day of the month |



Forecasts



| Month/Year | Forecast | Prob. Of Raise |
|------------|----------|----------------|
| Mar. 2017 | 1033€ | 66% |
| Abr. 2017 | 1049€ | 66% |
| Mai. 2017 | 944€ | 46% |
| Jun. 2017 | 1072€ | 56% |
| Jul. 2017 | 1087€ | 54% |
| Aug. 2017 | 913€ | 49% |

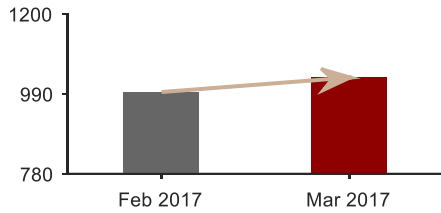
Suggested Action for Procurement

| Purchase Limit Month | Suggested Action |
|----------------------|--------------------------|
| March 2017 | Buy in February at 995€ |
| April 2017 | Buy in February at 995€ |
| May 2017 | Buy part of requirements |
| June 2017 | Buy part of requirements |
| July 2017 | Buy part of requirements |
| August 2017 | 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 in this document.

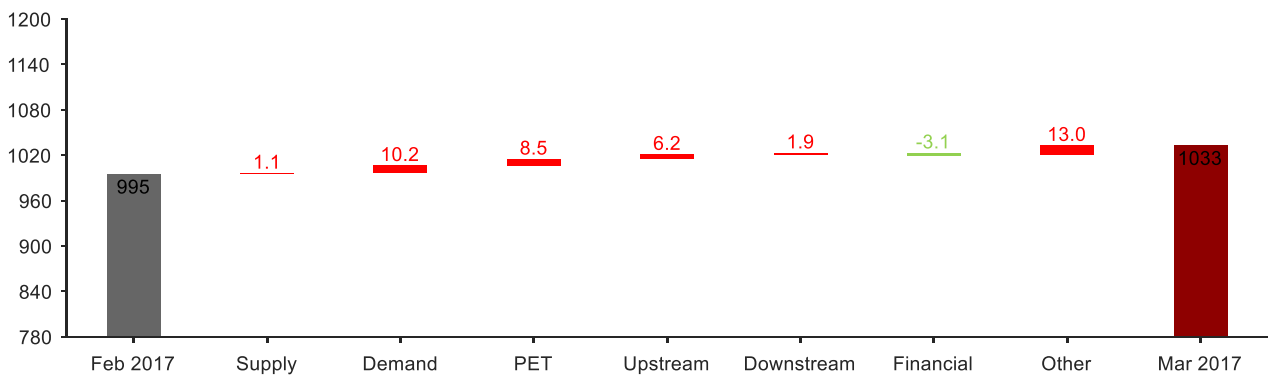
Forecasting the Price of PET

Impact Analysis: One Month Forecast



Our algorithm forecasts a higher price of PET in one month: it is expectable that the price increases 3,80% from 995€ to 1033€ until the beginning of March.

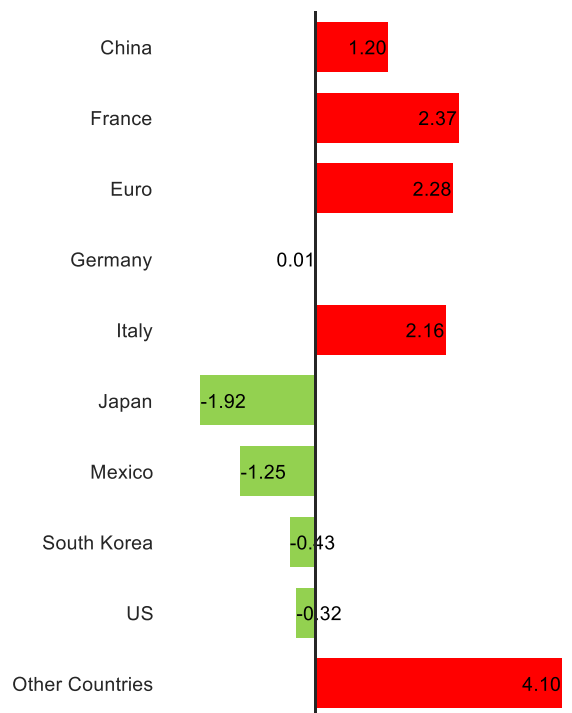
Indices of Factors



Interpretation

- Slight decrease of Supply: Positive pressure of the Supply index
- **Increase of Demand:** Positive pressure of the Demand index
- Positive pressure of the index of PET
- Positive pressure of the index of variables representing the market upstream
- Positive pressure of the index of variables representing the market downstream
- Negative pressure of the financial index
- **Considerably positive pressure of other commodities and other factors**
- Focus on Poland, France, and Euro

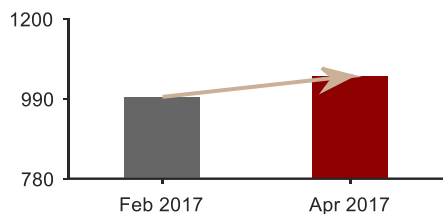
Impact per Country



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 in this document.

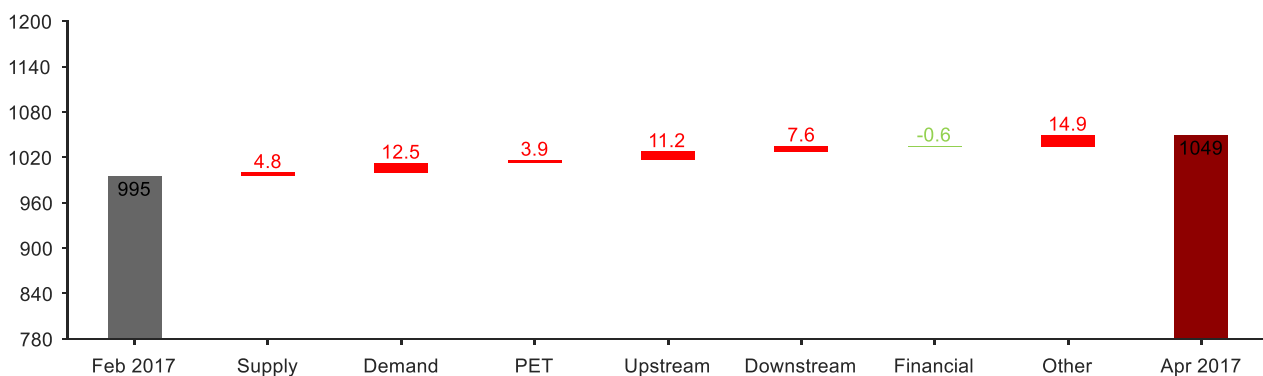
Forecasting the Price of PET

Impact Analysis: Two Months Forecast



Our algorithm forecasts a higher price of PET in two months: it is expectable that the price increases 5,46% from 995€ to 1049€ until the beginning of April.

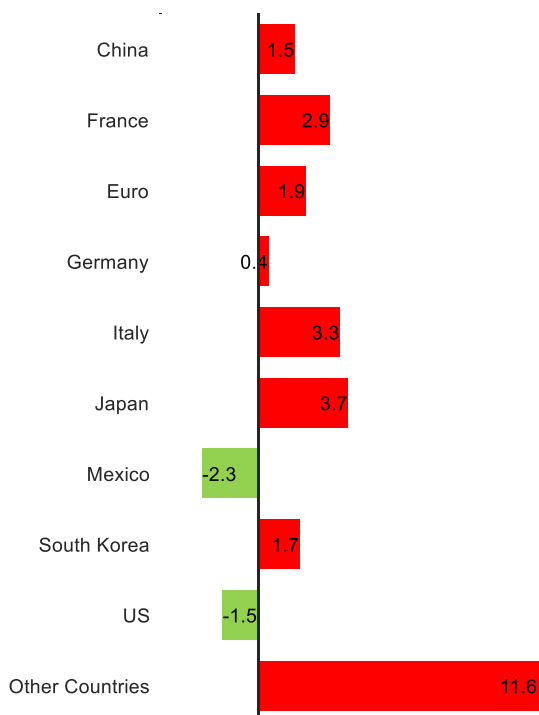
Indices of Factors



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 PET
- Positive pressure of the index of variables representing the market upstream
- Positive pressure of the index of variables representing the market downstream
- Slightly negative pressure of the financial index
- Positive pressure of other commodities and other factors
- Focus on Belgium, Japan, and UK

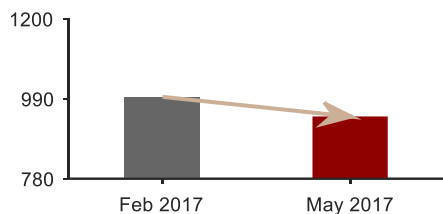
Impact per Country



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 in this document.

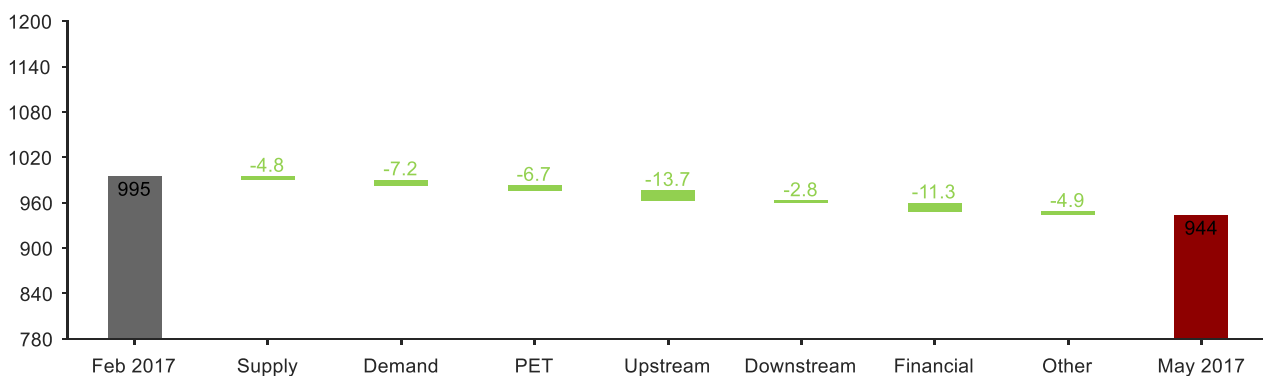
Forecasting the Price of PET

Impact Analysis: Three Months Forecast



Our algorithm forecasts a lower price of PET in three months: it is expectable that the price decreases 5,17% from 995€ to 944€ until the beginning of May.

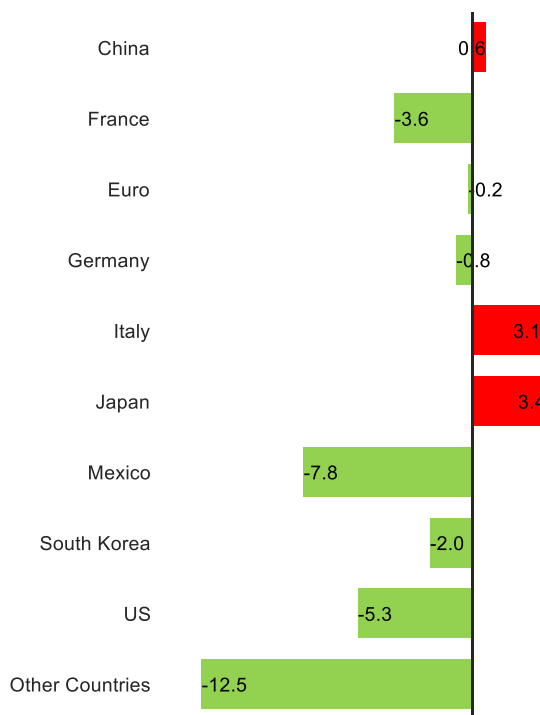
Indices of Factors



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 PET
- Negative pressure of the index of variables representing the market upstream
- Negative pressure of the index of variables representing the market downstream
- Negative pressure of the financial index
- Negative pressure of other commodities and other factors
- Focus on UK, Mexico, and US

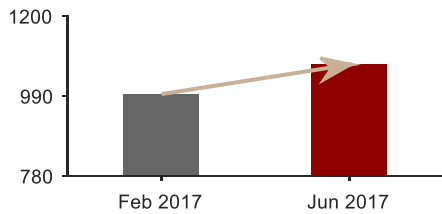
Impact per Country



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 in this document.

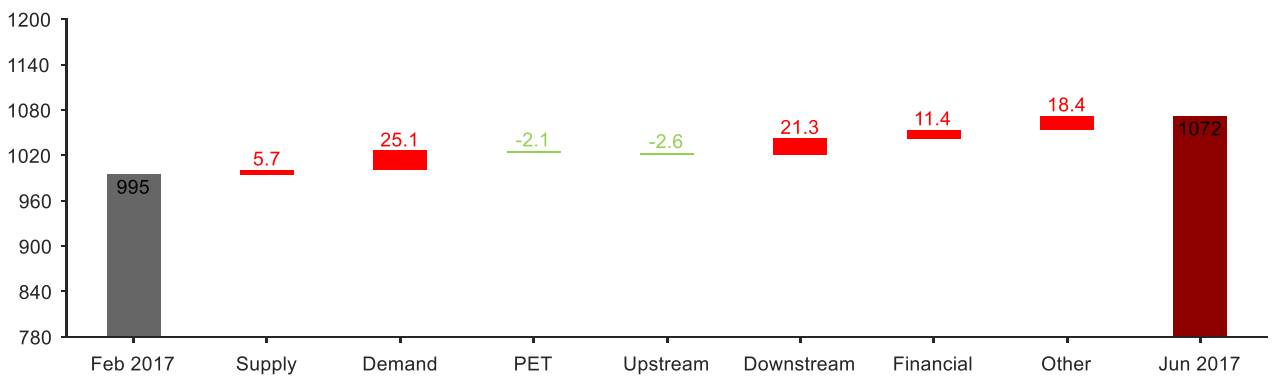
Forecasting the Price of PET

Impact Analysis: Four Months Forecast



Our algorithm forecasts a higher price of PET in four months: it is expectable that the price increases 7,75% from 995€ to 1072€ until the beginning of June.

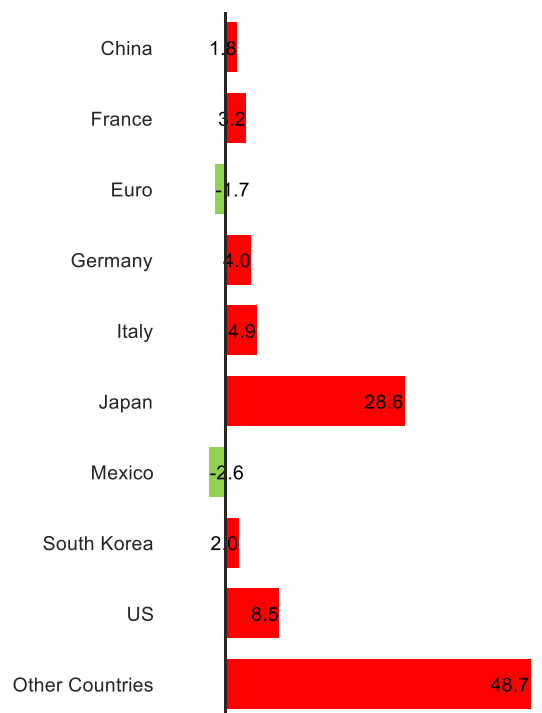
Indices of Factors



Interpretation

- **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 PET
- Slightly negative pressure of the index of variables representing the market upstream
- 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, US, and Belgium

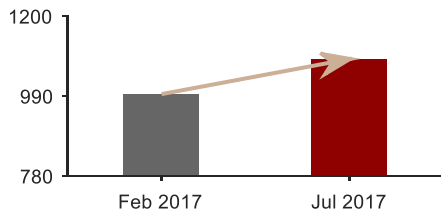
Impact per Country



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 in this document.

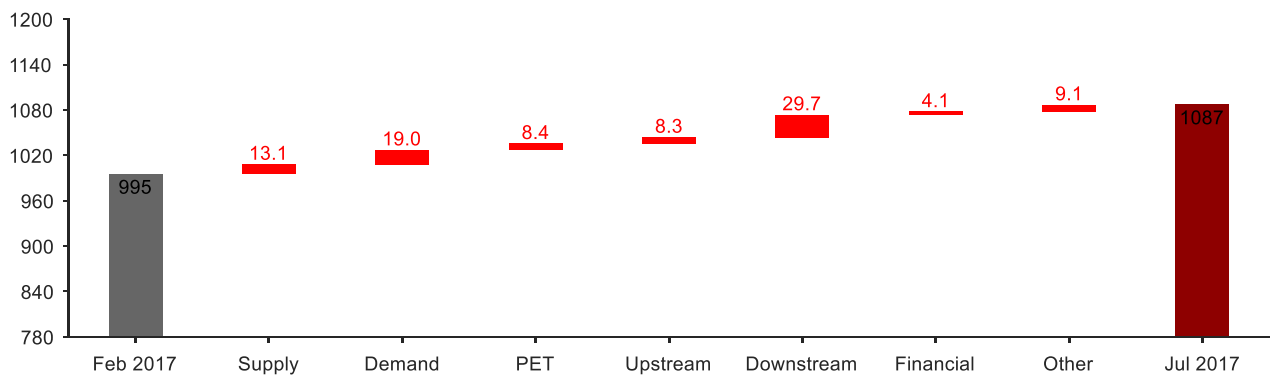
Forecasting the Price of PET

Impact Analysis: Five Months Forecast



Our algorithm forecasts a higher price of PET in five months: it is expectable that the price increases 9,22% from 995€ to 1087€ until the beginning of July.

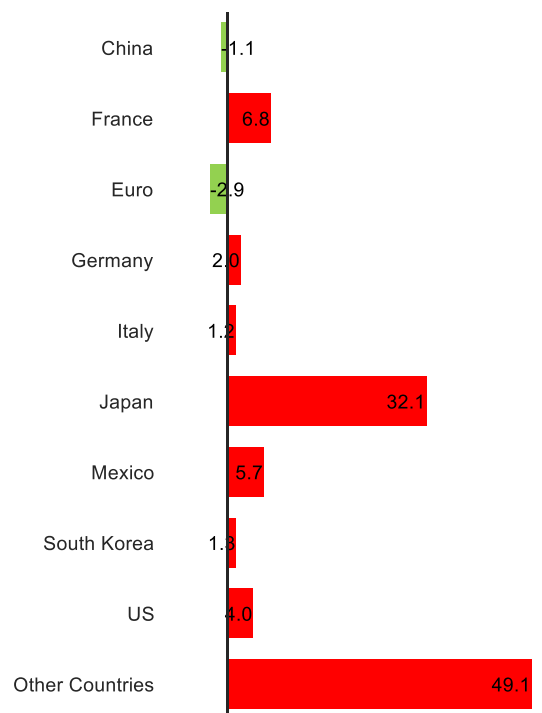
Indices of Factors



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 PET
- Positive pressure of the index of variables representing the market upstream
- **Considerably 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, France, and Russia

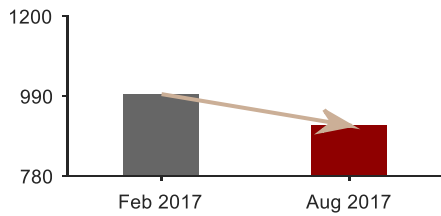
Impact per Country



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 in this document.

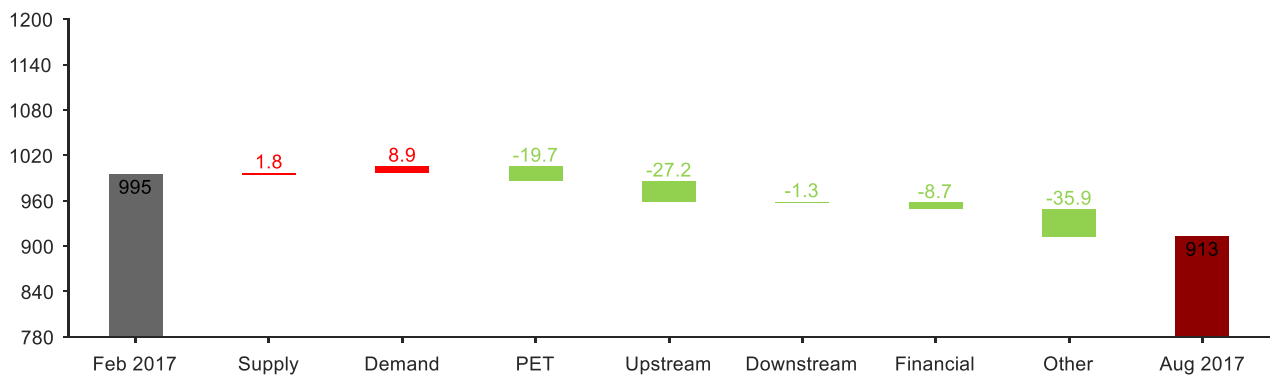
Forecasting the Price of PET

Impact Analysis: Six Months Forecast



Our algorithm forecasts a lower price of PET in six months: it is expectable that the price decreases 8,24% from 995€ to 913€ until the beginning of August.

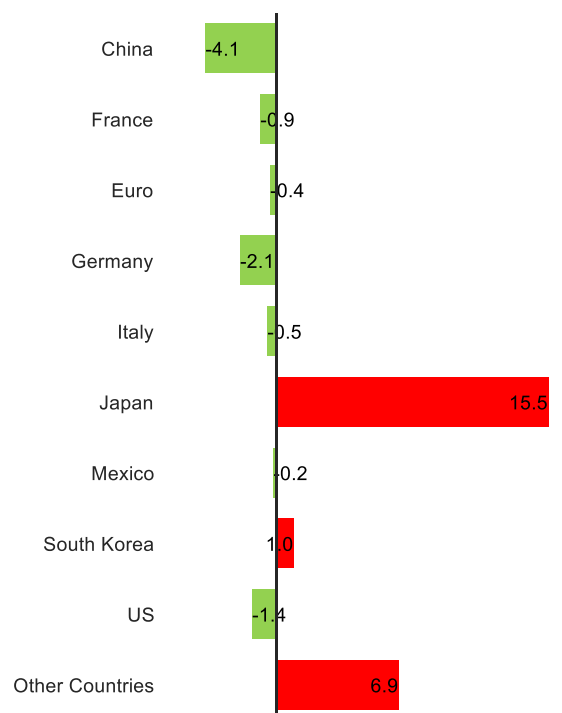
Indices of Factors



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 PET
- Negative pressure of the index of variables representing the market upstream
- Slightly negative pressure of the index of variables representing the market downstream
- Negative pressure of the financial index
- **Considerably negative pressure of other commodities and other factors**
- Focus on Japan, UK, 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 in this document.

Forecasting the Price of PET

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;

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

Upstream index: composed of variables related to Propylene, Oil, Natural Gas and Naphtha.. It includes variables such as the price and exports, imports, and producer prices of the inputs in some countries. For example, an increase in the price of Oil should (in linear, general, and *ceteris paribus* terms) generate an increase in the price of PET;

Forecasting the Price of PET

APPENDIX – Technical Explanation of the Impact Analysis

Downstream index: composed of variables related to downstream industries, such as Packaging and Textiles. 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;

Financial Variables Index: composed of financial market variables. It includes the share price of companies that produce PET. It also includes financial indices related to this sector. For example, a positive change in the share price of a PET 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 PET;

Other Variables Index: composed of variables related to other commodities, such as Ethylene and Benzene. 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 PET, and thus, of the price of PET.

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 PET.

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.