Are nitrogen fertilizer prices still predictable?

UNDERSTANDING FERTILIZER MARKET DYNAMICS

Volatility of markets for agricultural commodities has become a concern for farmers and the agricultural industry as a whole, especially since the large variations observed in 2008. Market volatility represents an economic risk for farmers and can have a significant impact on income.

As a manufacturer of fertilizer and important actor in the market, Yara would like to to explain, simply and transparently, the mechanisms influencing market dynamics and pricing.

YARA

Knowledge grows

European production for European agriculture

Nowadays, nitrogen fertilizer consumption and production are largely dominated by Asia as the weight of former leaders such as United States and Europe is declining. However, European farmers benefit from a local nitrogen fertilizer production, attenuating price variations and ensuring product quality.

VOLATILE WORLDWIDE MARKETS

Today, the nitrogen market is dominated by Asia, representing roughly 2/3 of global production and consumption [14].World fertilizer markets have been shaped, over the past few years, by an increase in total fertilizer consumption. The world demand for nitrogen fertilizer is expected to grow at 1.7% per annum from 2011 to 2015. Most of this increase will be observed in Asia, while others regions contribute little to the worldwide growth.

The dynamics of fertilizer demand and global imbalances increase tensions in nitrogen fertilizer markets and accentuate price volatility.

LOCAL PRODUCTION, STABLE SUPPLY

European agriculture benefits from a specific situation with a local production and supply chain of nitrate-based fertilizers. Local European production stabilizes prices, ensures steady product quality as well as compliance with social and environmental standards. The European nitrate production thus provides an important long-term advantage for agriculture.

With plants and research centers all over Europe, Yara is a reliable supplier of high quality fertilizer. Yara's production sites set standards in environmental compliance and create agronomic and economic benefits for European farmers.

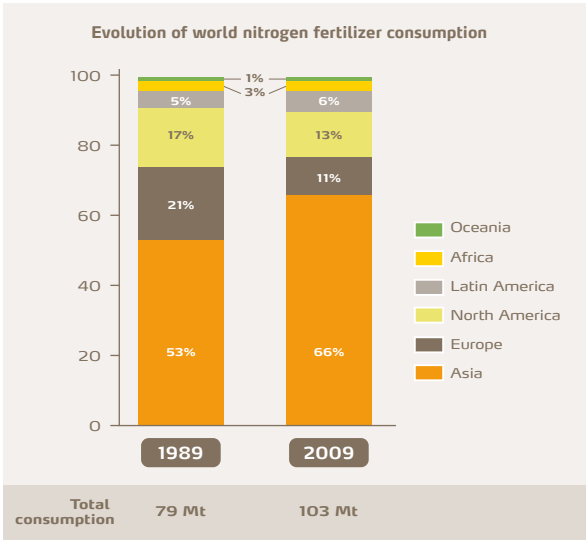


Figure 3: The Nitrogen market is dominated by Asia, representing more than 4 times the weight of Europe. The weight of Europe has continuously decreased from 21% in 1989 to 11% in 2009. France, Germany and Benelux represent today respectively 2.0%, 1.5% and 0.4% of the world consumption [14].

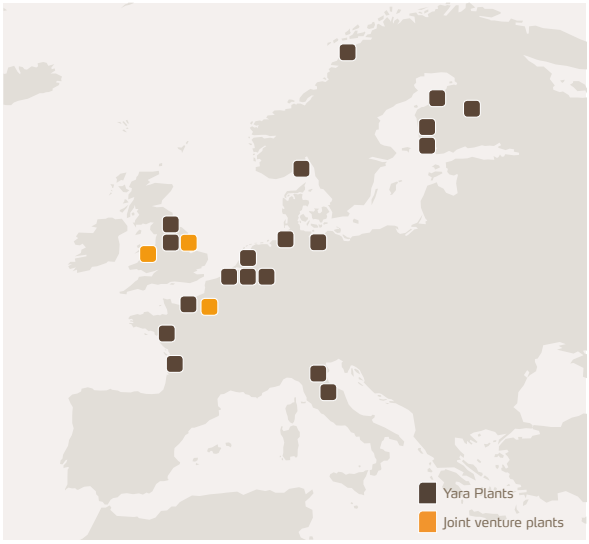


Figure 4: Yara's plants are located all across Europe, providing high quality fertilizers to European farmers.

Fertilizer supply and demand: **a global market**

The steep increase in fertilizer prices over the 2007-09 period, followed by their abrupt decline as a consequence of the economic crisis, only went to highlight the volatility suffered by the sector. This volatility, which can be explained by a combination of structural and conjunctional factors, has led farmers to raise some questions: Who are the players in this so-called worldwide market? How to explain the fluctuating prices? Can they be anticipated?

A DELICATE BALANCE

In the main, prices of fertilizer and foodstuffs result of the balance between supply & demand in a now global market place. This balance is currently at its most fragile. The increased volatility in prices of agricultural produces and raw materials, such as fertilizer (see Figure 2), reflects the tensions in foodstuff production across the world. In addition, the evolution of fertilizer and foodstuff prices has become increasingly correlated to the world's economy. Farmers are seriously exposed to this new economic factor [1][15].

FERTILIZER DEMAND

Emerging countries such as China, India and Brazil have ever increasing demands for foodstuffs and energy. This trend is further accentuated by an increased demand for high-protein foods. The resulting increase in meat & dairy products leads inexorably to a higher demand for cereals. This general trend is further exacerbated by numerous governments across the industrialised nations encouraging the production of bio-fuels.

Over the last ten years, the global demand for foodstuffs (consumption) has increased faster than supply (production). Over the same period, global stocks have been reduced by, on average, half. The demand for fertilizers, led by agricultural production, has followed the same trend [2].

FERTILIZER SUPPLY

Over the last thirty years, global fertilizer industry has been shaped by an excess supply. Faced with an increasing demand, a lack of investment and a globalization of markets, supply today is barely keeping up with demand.

The market for nitrogen-based fertilizers is determined by the price for ammonia (NH_3) an intermediate for fertilizer production. Ammonia production requires high amounts of natural gas. In the end, natural gas represents more than 50% of the cost prices of nitrogen fertilizers production [3].

Gas price volatility increases the tension in the supply of fertilizers: in the short term, as gas price increases, some production plants are shut down. Over the longer term, it reduces the profitability of production plants and leads to a decrease in investment in new production capacity.

Low gas prices are a factor of competitiveness in the fertilizer industry. This is why, over the past few years, mineral fertilizer production plants have been relocated in resource-rich countries (Russia, Iran, Qatar, North Africa). Remoteness of production sites, along with geo-political instability, however, has increased uncertainty in terms of both production and procurement, stimulating volatility [4].

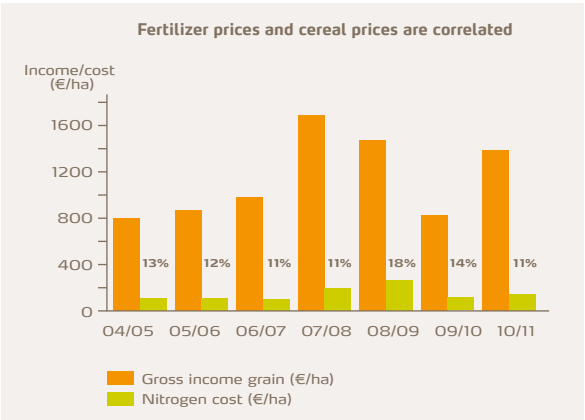


Figure 1: The increase in fertilizer prices is generally accompanied by a simultaneous increase in cereal prices. Fertilizer cost remains a fraction of gross farming income, even in inflationary periods [5].

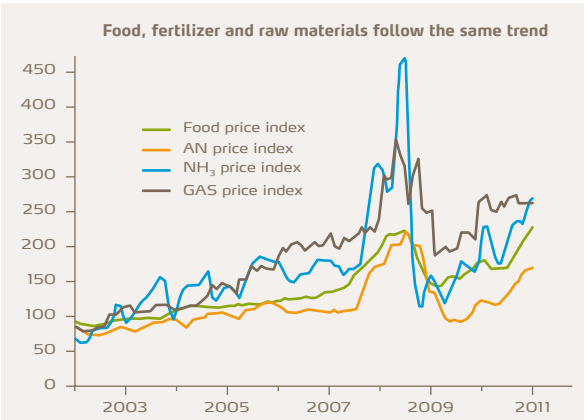


Figure 2: The prices of gas, ammonium nitrates & the FAO Food Price Index all tend to follow the same trends. The FAO Index is based on an average world market price for five product groups (meats, dairy products, cereals, oils/fats & sugar) [5].

IS THERE ENOUGH COMPETITION?

The nitrogen fertilizer market is shared by a great number of suppliers from all over the world. One of the most important of them is Yara, but even Yara represents only 6% of the world-wide nitrogen supplies.

The fragmentation of the nitrogen fertilizer market with its many suppliers ensures that prices are adjusted as a balance of demand and supply. The observed market volatility shows that prices cannot be controlled but are fixed by markets dynamics.

AND WHAT ABOUT SPECULATION?

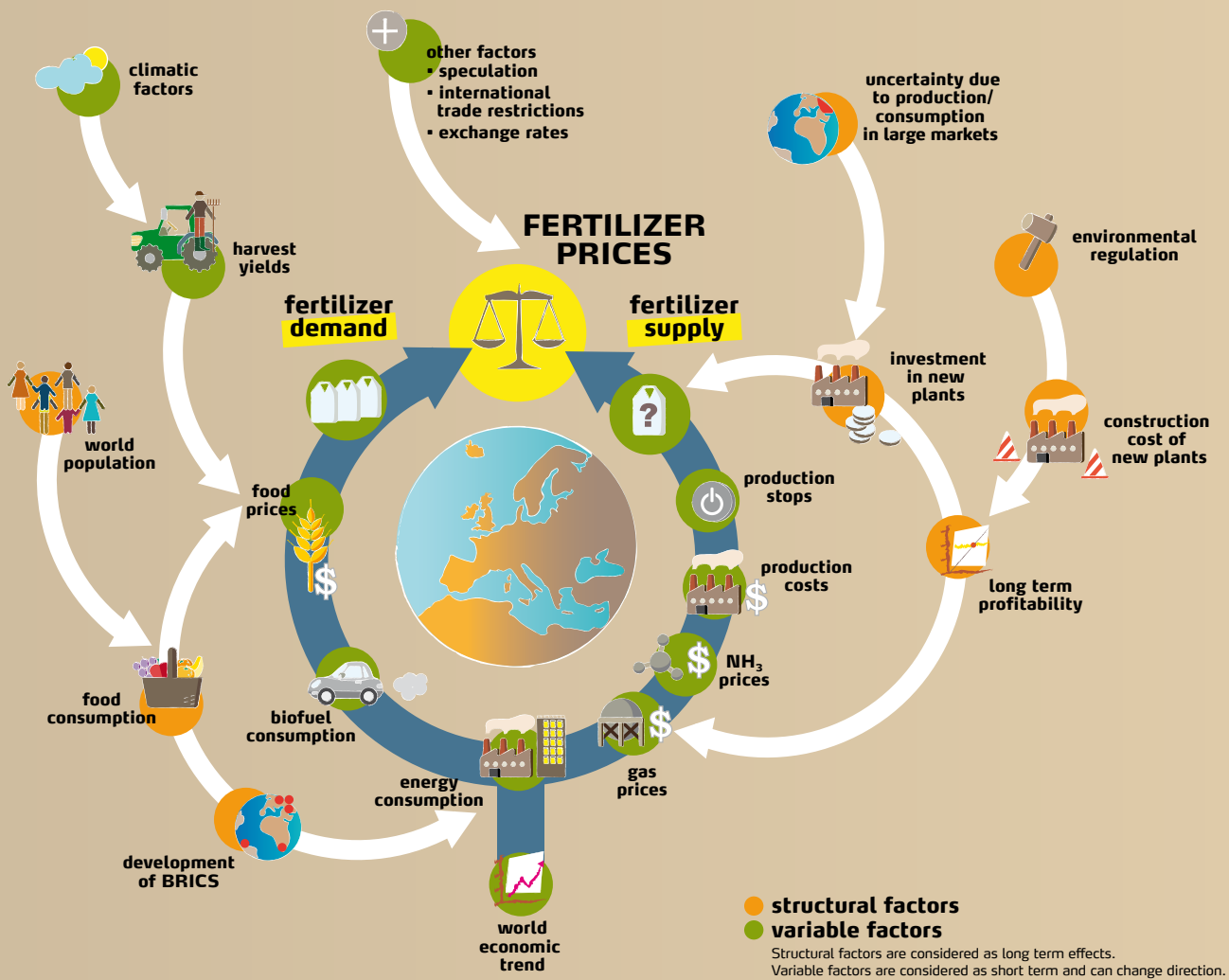
With the structural and conjunctional tensions in mind, the role of speculation arises. Market values are indeed no longer based solely on the difference between supply & demand, but are evolving exponentially.

For example: if less than 10% of world production is traded on the global commodity markets, a 2% decrease in production will be primarily deducted on exportations, creating a 20% shortage of globally traded volumes!

Thus, volatility arises from imbalance between supply & demand, and is further intensified by market globalization.

Financial instruments can accentuate or dampen this volatility. Initially created to cover a genuine risk inherent in agriculture (low yield harvest, drops in price), they were designed to stabilize prices. However, today's financial instruments are mostly disconnected from actual production.

In summary, volatility is caused by tight market situation which in turn encourages speculative actions [6].



FERTILIZER PRICE DYNAMICS

Climatic factors: Climatic factors such as drought, hail, rain and frost affect crop growth and have an unpredictable impact on harvest yields.

Harvest yield: Harvest yield expectations have an important impact on food prices.

Food prices: The combination of various structural and conjunctional factors, explained in the paragraphs above, has led to an increase in agricultural products prices. Between 2001 and 2012, cereal prices have increased by nearly 160% [12].

World population: The population of the world today has passed the 7 billion mark, and is expected to exceed 9 billion by 2050 [7].

Food consumption: Population growth and changes to diets in emerging nations, in favour of dairy and meat products, lead to an increasing demand for agricultural products. This increase will reach 70% by 2050 [6].

Development of BRICS: The term 'BRICS' designates the five emerging world powers (Brazil, Russia, India, China & South Africa). These countries are growing rapidly, both in terms of demographics and economics. They can currently lay claim to 40% of the world's population and are likely to be responsible for 61% of global growth by 2015 [8].

Bio-fuel consumption: Bio-fuels use is stimulated by public authorities and by increasing cost of fossil fuels. Projections state that by 2020, 12% of the production of secondary cereal crops, 16% of vegetable oil and 33% of sugar production will be transformed into bio-fuel across the globe [11].

Energy consumption: The economic expansion of the BRICS countries accounts for two thirds of the increase in energy consumption across the world (+5.5% in 2010). Experts are expecting this demand to double by 2050 [9] [10].

World economic trend: The world economic context has a major impact on the fertilizer market, since both are closely linked to cost of energy.

Gas prices: Globalization of the liquefied natural gas market has increased price volatility.

NH_3 prices: Ammonia is a globaly traded raw material for fertilizer production and its price has a major impact on nitrogen fertilizer production cost.

Production costs: Natural gas, used as a raw material, represents, on its own, around 50% of the total cost of producing nitrogen-based fertilizers. Therefore, any increase in the cost of gas is inevitably followed by an increase in production costs [3].

Production stops: Due to the volatility in the price of gas, some fertilizer production plants are shut down when gas price is too high on the world market.

Environmental regulations: In developed countries the fertilizer industry is confronted with ever increasingly strict environmental standards.

Construction cost of new plants: Environmental requirements, combined to other factors, have significantly increased construction costs of new production plants.

Long-term profitability: Increasing construction costs and gas prices volatility has decreased the long-term profitability of projects.

Uncertainty due to production/consumption in large markets: Production of nitrogen-based fertilizers is dominated by large market countries, such as China. The majority of whose production is however currently reserved for internal consumption. Even small changes in import & export quotas play a primordial role in changing world markets. Faced with this lack of future visibility, any investment in new production capacity remains at risk.

Investment in new plants: Decreased project profitability, uncertainties about the export quotas of the larger producing nations and the credit crunch have led to a decrease in investment in new production capacity. To assure competitive prices and optimize the production chain, mineral fertilizer production plants are relocated to resource-rich countries, which in turn creates logistical and supply problems.

Speculation: Speculation tends to exacerbate price volatility.

International trade restrictions: Some countries increase export duties during the main growing season in order to secure domestic fertilizer supply for farmers. These taxes lead to higher global fertilizer prices.

Exchanges rates: Exchange rate swings play an important role in all markets including fertilizer markets. Countries relying on import to satisfy their fertilizer needs are exposed to price fluctuations.

Managing fertilizer price risk

Agricultural producers are subject to a wide range of risks including prices of agricultural produces and raw materials. Those prices are dependent on a multitude of factors and are difficult to anticipate. Price volatility should not however be a fatal issue. There are solutions available, designed to reduce risk and stabilize income for farmers.

MANAGING FERTILIZER COSTS

Mineral fertilizers represent an important share in the operating cost of a farm. Knowing that the price of fertilizer is mainly drawn by the cost of cereals, fertilization at the economic optimum always offers a decent return on investment. Applying fertilizers with highest nitrogen efficiency according to best agricultural practices and using precision farming technology further reduces fertilizer cost. The financial management of the operation, however, remains difficult due to short-term uncertainties in fertilizer prices. To ensure profitability, farmers need to protect their revenues against excessive changes.

Several methods are available. The easiest, called diversification, is to spread fertilizer purchase across the whole year. When purchasing 25% of annual requirements each quarter, potential variations are flattened out [13].

Fertilizer price volatility is a new phenomenon, concerning the whole supply chain, from production over trade and distribution to financing. Tools and services to reduce the impact of price volatility on farmers will need to be worked on by all stakeholders in the supply chain, including industry, distribution and financial institutions.

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For further information about nitrate fertilizers, get the complete nitrate fertilizer brochure from www.yara.com

For multimedia contents on farming, visit our YouTube Channel: www.youtube.com/yarainternationalasa

ABOUT YARA

Yara International ASA is an international company headquartered in Oslo, Norway. As the world's largest supplier of mineral fertilizers for more than a century, we help to provide food and renewable energy for a growing world population.

Yara provides quality products, knowledge and advice to farmers. Please do not hesitate to contact one of our local agronomists for further information.

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