

Sector & Company Insights

The impact of El Nino/La Nina

BSC RESEARCH

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Experts and Forecasts

Each year, experts from all fields, using sophisticated forecasting models (or their guessing) to make forecasts from long-term to a decade, but the funny thing that most expected accuracy rate even for a short time under 1 year are not high. This makes us wonder how many people thought terrorist event of the day 10/9/2001, how many people in 2006 who saw the financial crisis and subprime mortgage in the US ("The big short" film), and how many people in Sep 2014 saw oil prices plunge trend ... This makes us realize we know little about how the world we thought we knew perfectly well.

The stock market and the changes

There are very few sectors with great and immediately volatility due to all related information (or investors think it is related) as the securities. However there is always a certain distance between the base value of the business and stock price movements of such enterprise. One of the biggest changes, most unpredictable and most unexpected potential, may come from climate change.

Climate change and Stocks

Although science and technology develop, but the agriculture, forestry, fishery and part of the industries, the food is still very much depended on the weather and the environment. Climate change may cause a very favorable sector become difficult and reverse.

This report will mention climate change issues, the rotation of phenomenon as the El Nino & La Nina, and impacts to related industries such as:

- Direct: Sugar, milk, rubber, fisheries, animal feed, electricity;
- Indirect: Textile, Fertilizers.

Content

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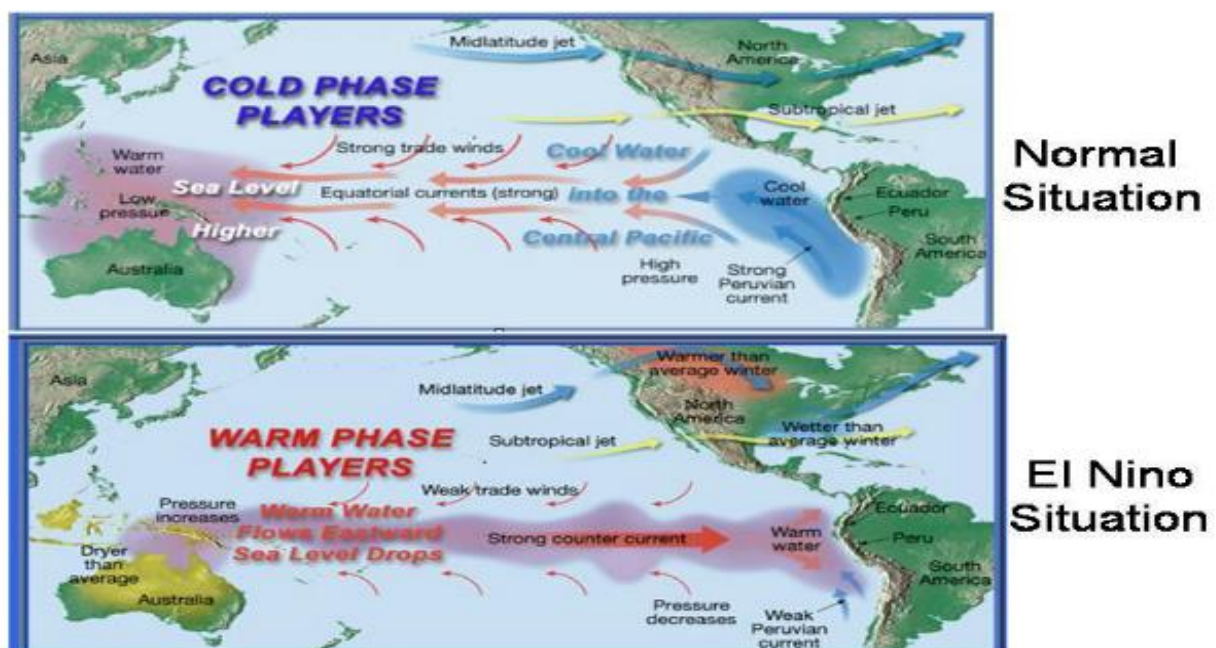
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Overview of El Nino/La Nina

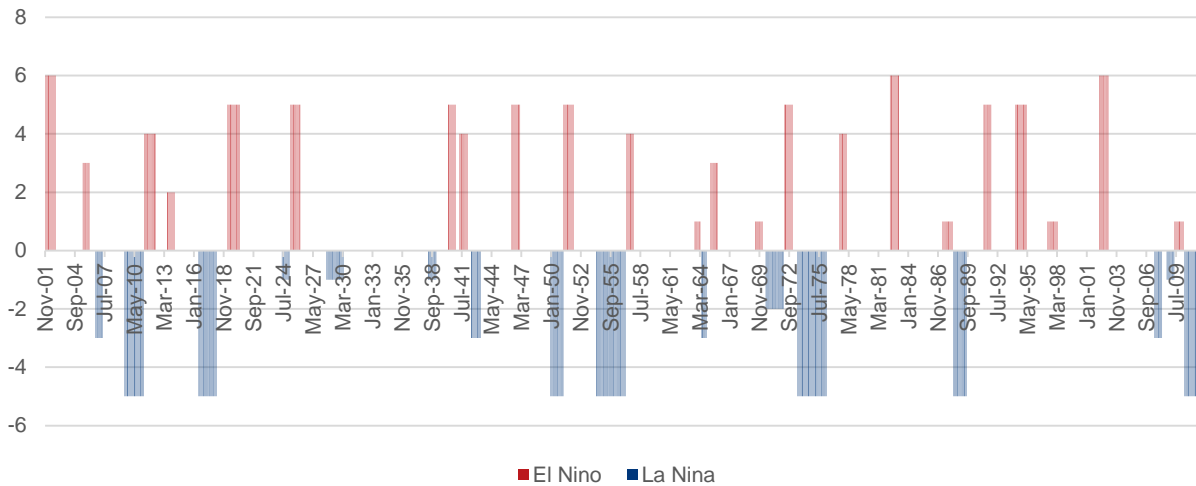
El Nino is the abnormal warming of the sea surface in the central and east-central equatorial Pacific, lasts 8-12 months or longer, occurs every 3-4 years but sometime frequently or more sparse.

La Nina is opposed to El Nino, known as the phenomenon which marine waters in the Pacific is abnormal cold due to the strength of the trade winds. La Nina may appear after El Nino or after neutral period. La Nina is formed from March to June and influences the most powerful in the end of year until February next year. La Nina usually lasts from 14 to 24 months.



In normal conditions, the trade winds (monsoon winds) blow from East to West and put hot water in the Western Pacific back. Due to sea level in Indonesia is 0.5 m higher than Ecuador. Sea surface temperature in the West is about 8°C higher than the east. In South America, the surface layer between warm water and cold water is not deep. This facilitates cold water beneath the surface floats to the surface. Cold water is rich in nutrients, promotes the development of primary production organism, makes diverse marine ecosystems and the fish catch quantity is increased. In this period, rainfall increases in warm sea areas (West Pacific) and decreases in the East Pacific.

The schedule of El Nino and La Nina from 1900 to 2012

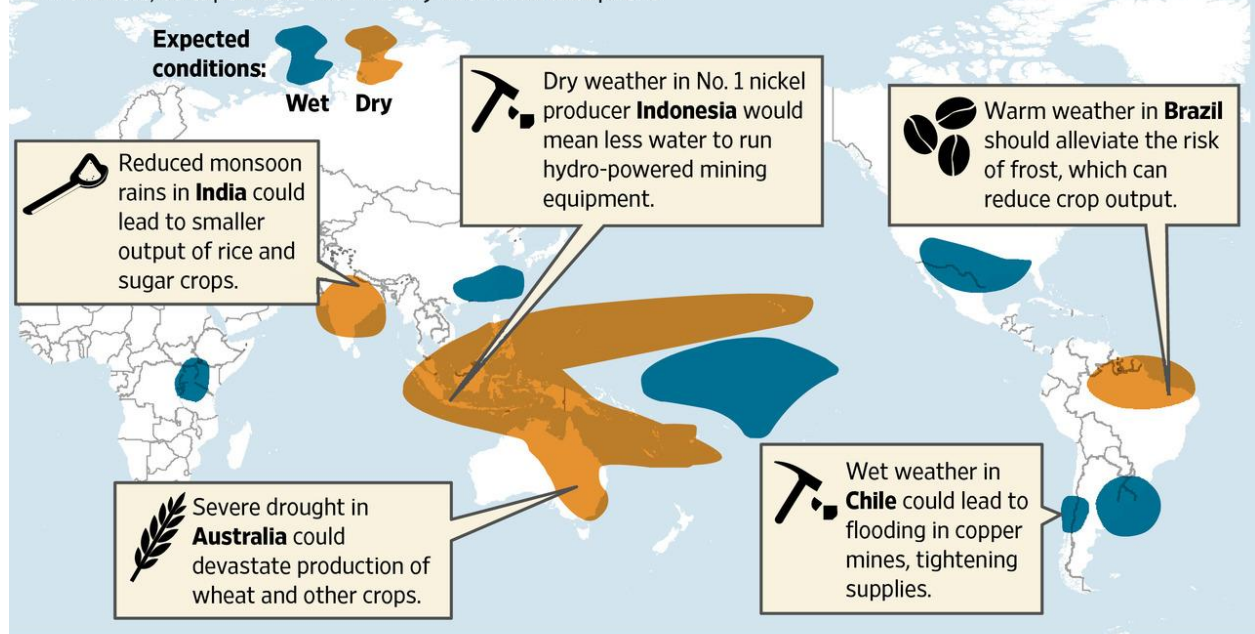


Source: Australian Bureau of Meteorology

When El Niño occurs, the trade wind will be weaker in central and East Pacific. The water spreads from the west coast to east coast of the Pacific. This process makes the interface layer between hot water above and cold water below down deeper therefore inhibits the emergence of the cold water, makes the East less production organisms and fish. Rainfall increases follow the hot water flow causes flooding in Peru and drought in Indonesia and Australia. For La Niña is the opposite.

Weather Woes

El Niño is here, so expect some commodity rises amid disruptions.



Sources: National Oceanic and Atmospheric Administration; commodities analysts

THE WALL STREET JOURNAL.

The impact of El Nino/La Nina on Vietnam

	Impacts of El Nino	Impacts of La Nina
Storm	Number of storms impacted on Vietnam in the East Sea is 27% less than usual and end earlier than usual.	Number of storms affected Vietnam in the East Sea is 38% more than usual and will end later than usual.
Frequency of cold fronts	End time of cold air activities in Vietnam is earlier than usual.	End time of cold air activities in Vietnam earlier than usual.
Temperature	Average temperature in months is higher, the difference between winter and summer is more pronounced, and the South is impacted rather than the North.	Average temperature in months is lower, the North affected than the South.
Rainfall	Rainfall declines by 20-50% in most regions of the country; the most obvious is the North Central.	Rainfall exceeds the average level in many years, especially in the coastal provinces of Central and South West
Rivers flow	Flow this year is 10-60% smaller than the average many years. In flood season, flow is higher than the average many years and in the dry season flow, volume of flow is 10-20% smaller than average.	The flow of the river is greater than the average of many years, may be 80-100% greater. Flood season flow is smaller than the average of many years and the dry season flow is 1-40% less than the average of many years.
Agricultural production	The average rice productivity in winter-spring crop downs from previous crop, especially in the North Central.	The average rice productivity of winter-spring crop and season crop increase compared with previous crop. The best winter-spring crop is in the North, and the best season crop is in the Mekong Delta.

Sources: BSC Research

El Nino/La Nina forecast

The major meteorological research organizations including World Meteorological Organization (WMO) and the Agency of Aeronautics and Space USA (NASA) have identified El Nino had peaked in January and 1/2016 is the hottest since 1980. These organizations also share the views that El Nino will weaken and moves to a neutral phase in late spring or early summer of 2016, then La Nina will form and appears in autumn 2016. For Vietnam, as assessed by the meteorological experts, the intensity of El Nino will reach peak in March and lasts until mid-2016.

El Nino/ La Nina forecast probability in 2016

Season	La Niña	Neutral	El Niño
Jan- Feb- Mar	0%	0%	100%
Feb- Mar- Apr	0%	2%	98%
Mar- Apr- May	1%	7%	92%
Apr- May- Jun	2%	27%	71%
May- Jun- Jul	10%	46%	44%
Jun- Jul- Aug	22%	51%	27%
Jul- Aug- Sep	37%	47%	16%
Aug- Sep- Oct	44%	44%	12%
Oct- Sep- Nov	50%	40%	10%

Source: International Research Institute for Climate and Society of Columbia University.

The impact of El Nino/La Nina on sectors

Electricity-Strong The operating of hydropower plant directly rely on the hydrological including rainfall and flow

The impact of El Nino

El Nino leads to the heavy deficit in rainfall and flow, which is difficult for hydropower production activities while the thermal power plants benefits indirectly. The reduce in hydropower plant's volume is an opportunity for thermal power plant to raise output volume and the price on Vietnam competitive generation market (due to the decrease in low price electricity source from hydropower plants)

The impact of La Nina

Due to La Nina, rainfall and river flows are higher than the average of many years, especially in the central and southern provinces where hydropower plants are located. Thus, the output of the hydropower plants will increase.

Hydroelectric power supplies that are cheaper. Therefore, when hydropower production, demand more abundant thermal mobilization will fall and the market price on competitive electricity and gas density decreases Cheap power increase.

Impacts on Vietnam enterprises

- In 2015, hydropower volume fell by 6% due to El Nino. In 2015, rainfall was 20-40% lower than the average of many years. Specifically, the rainfall in South Central region was 30-50% shorter than the average of many years, 20-70% shorter in the Central Highlands and South East. The river flow was 20-70% lower than the average of many years in the North, the Central and the Highland. In the South, the total river flow was 10-60% lower than the average of many
- The year 2016 may continue to be a difficult year for hydropower, especially in the dry season in central and southern due to the water priority for drinking and irrigation. As of 03/11/2016, there are 15/51 plants withdrew from competitive electricity market. Therefore, thermal power output volume increased strongly to compensate for the lack of volume from hydropower. In the first 2 months, the volume of NT2 grew by 7% while the volume of SHP and CHP declined 37% and 44% in respectively.
- The rainfall is forecasted to 25-50% lower than the average of many years in 2016. In the first 6 months, the rainfall in the North will be higher or approximate the average of many years while the rainfall in the Central, the Highland and the South will be 30-50% lower than the average of many years.
- The river flow in 2016 is forecasted to lower than the average of many years by 50-70% in the South, 60-80% in the Central. The river flow in the Highland and the South will be lower than the average of many years by 60-80% from Feb to Apr and 30-50% from May to Jun.
- In contrast, if La Nina occur in the end of 2016, this will be the opportunity to recover for hydropower plants thanks to the strong increase in rainfall and river flow in dry season.

Related stocks:

- Hydropower: CHP, SHP, SJD, TMP, TBC, VSH, SBA, GHC
- Thermal power: NT2, PPC, BTP

Fertilizers– Strong Fertilizer demand depends on temperature and rainfall. With the low temperature areas, organics is slowly resolved, the nutrient supplied from organics in soil and fertilizers is few, the plant should be applied more chemical fertilizers. In the high temperature areas, it is necessary to apply enough organic fertilizer to balance organics in soil. Phosphorus and Kali will raise the cold tolerance of plants and Nitro will reduce the cold tolerance of plants.

If it is drought, soil lacks of water. Hence, the organic fertilizer will be slowly resolved. In contrast, if it is much rainy, the fertilizer will be washed away.

After flooding, soil is alluvial and desalinated. Hence, the soil needs to apply phosphorus and Kali. In the next crop, it needs Nitro, Phosphorus and Kali, especially Phosphorus fertilizers.

The impact of El Nino

Due to El Nino, the decrease in rainfall and river flow as well as the salinization influence seriously on agricultural production activities. The narrowing arable areas and the lack of water will lead to the decline in fertilizer demand.

The impact of La Nina

La Nina usually causes flooding, waterlogging killing plants of farmers in Central, reduces demand for fertilizers. Meanwhile in the Southern and Northern – 2 main farming areas of Vietnam, more rain make fertilizer easily to be washed away, so the demand for fertilizers can increase.

Impacts on Vietnam enterprises

Under The impact of El Nino, the provinces in South Central, Highlands and the South East faced with the strongest drought in 40 years. 2015 is the year with the highest temperatures since 1971. Temperatures were 0.5 to 1.5°C higher than the average many years and 0.5°C higher than 2014. In addition, the difficulties in irrigation water, farmers faced with the serve salinization. During the winter-spring rice crop 2015-2016, 23% cultivated area in Mekong Delta were at risk of drought and salinization. As of May 3/2016, 11 provinces of Vietnam announced drought, saltwater intrusion emergency.

Due to the decline in domestic fertilizer demand and the down trend of global fertilizer prices due to oversupply in the first 2 months of 2016, prices of fertilizers in the country plummeted by about 14% in urea fertilizer and 10% in phosphate fertilizer.

Worldbank forecasts fertilizer price in 2016 will decrease by 2-5% compared to 2015, which Phosphorus prices fall the most of 5%, the other fertilizers fall by about 2%.

Related stocks: DPM, DCM, BFC, LAS, QBS, DDV, SFG

Fisheries– Strong

Vietnam with a dense network of rivers and longer 3,260 km of coastline, favorable development of aquaculture activities. For catfish: are freshwater fish species live throughout the Mekong river, where non-saline waters from the ocean. With this feature should the provinces located along the Tien river and Hau river are very favorable for raising catfish.

For the shrimp: the specie is compatible with the brackish waters near the sea. With this feature, Central, South Central (Khanh Hoa, Phu Yen, Ninh Thuan, Ba Ria - Vung Tau ...), the Mekong Delta (Long An, Tien Giang, Ben Tre, Tra Vinh, Soc Trang, Ca Mau and Kien Giang) are the most focused on shrimp production nationwide.

The impact of El Nino

El Nino complex movements are negatively impacts to aquaculture situation in the country. For catfish industry, due to raw material sources mainly coming from domestic, prolonging El Nino will led to the shortage of goods for export purposes. Specifically, the first two months of 2016, raw fish sector declined for the first time in 10 years as the fishery planting was not supplying enough raw materials for production. Apart from a few remaining fish production from 2015 passed, catfish of new crop in citizens and businesses only meet about 50% (about 500,000 tons) compared to the demand for processing and export throughout 2016 that is 1.2-1.4 million tons of material. Cause: (1) the price of catfish exports dropped as farmer has quitted field or changed to other aquatic products (2) El Nino increased diseases and reduced the area of aquaculture.

For the shrimp industry, although the input materials are mainly imported from countries such as India, Indonesia, El Nino prolonged negative impact on the industry. Output of white shrimp Long River Delta region the largest shrimp is estimated at 218 930 tones country-, down 9%, mainly due to adverse weather, prolonged heat and disease.

Impacts on Vietnam enterprises

HVG: HVG owns aquaculture areas which enough to ensure 70% of production materials. In 2015, sales volume spike bounces due to antibiotic residues above the permitted level, the density of HVG thick fish. With the possibility of El Nino and later La Nina, fish diseases complicated place

source of raw materials for production of HVG can be affected negatively: Number of returned goods may rise

VHC. VHC is one of few Vietnam seafood enterprises that are exempted from anti-dumping duty in the US. Appropriate stocking density of fish, about 200000-300000 tones / ha helps to reduce disease in fish. However, due to the characteristics of aquaculture depends on the weather, fish production inputs will also adversely affected if the La Nina occurs.

The impact of La Nina

Typically, La Nina will be followed El Nino, increased precipitation and decreased average temperatures. Due to the majority of the aquaculture farm located near the sea, brackish water, abnormal movements of the floods would cause a negative impact to aquaculture areas, especially Central. In addition, the continuous water flow changes caused by the heavy rains likely to develop disease resistance and reduce aquaculture such as white shrimp, shrimp and catfish. In addition, heavy rain will reduce yields of corn, wheat, the main raw material of the fishery

The possibility of salinization, prolonged flooding can go deep sea to the mainland; catfish farming areas will be adversely affected.

- Rubber** – Rubber trees are hydrophilic, but cannot tolerate waterlog and wind. The trees can withstand up to 4 months of drought, although with lower harvest yield. Rubber tree tapping season is usually 9 months per year, and must be in dry weather conditions, to ensure quality of latex.

Strong

The impact of El Nino

El-Nino phenomenon leads to drought in some major producing countries such as Indonesia, Thailand and India, thereby decreases the rubber output. In addition, dry weather indirectly created haze for Malaysia and Indonesia, which caused a lack of sunshine and negatively affect the quality of latex.

The impact of La Nina

La-nina phenomenon is expected to occur in late 2016, and is likely to have significant impact on rubber production. According to the La-nina in 2011, rainfall caused floods in Thailand, resulting in rubber supply shortages and pushed rubber prices to a history high level. In addition, the increased rainfall will negatively affect the quality of latex, and reduce the amount of rubber tapping days of the year.

Impacts on Vietnam enterprises

The improvement in rubber prices will benefit domestic rubber companies. However, Vietnam's rubber-growing provinces like Tay Ninh, Binh Phuoc, Binh Duong are expected to suffer a severe drought this year, which will affect the productivity and output of the rubber industry.

Related stocks: DPR, PHR, TRC, TNC; HRC

Dairy

Medium

Dairy cows have temperate origin and are often grazed on the grassland. They need to be met their demand of fresh water, nutrient grass and suitable temperature (-4°C to 22°C) for high milk yield.

The impact of El Nino

When El Nino occurs, the average temperature in the most dairy producing and exporting countries such as Australia, New Zealand ... increases, the prolonged drought will affect the growth of fresh grass and make the cow more stressful, which will reduce production yield. The impact of El Nino to grazing areas in Vietnam is similar.

Currently, dairy supply exceeds demand by 25%, milk powder prices continue to decline. In 2015, the price of milk powder fell -45% yoy with SMP and -34% yoy with WMP. El Nino occur is expected to cut down the oversupply, contributing to balance the milk market.

Impacts on Vietnam enterprises

Dairy firms in Vietnam will be benefited when the world milk powder price is expected to keep declining under either phenomenon. VNM also be affected from the domestic material area (more than 90,000 cows currently) while HNM has begun to build material area.

Related stocks: VNM, HNM.

The impact of La Nina

La Nina makes the average rainfall in Australia, New Zealand ... and in Vietnam increase, which will help the grass grow better, increase nutritional food source for cows. The decrease of average temperature also help cows more pleasant and therefore, milk production can increase slightly. Note that, in an environment of high humidity, insects such as flies, mosquitoes, ticks,.. will attack the cows, which will damage directly to the health of cows.

La Nina may cause milk supply increasing, making raw milk powder prices continue to decline.

Sugar-Medium

Sugar canes are water-intensive crops but they are horrified by waterlogging. The growth stage of sugar cane requires the rainfall from 100 to 170mm per month but need dry when they are ripe in order to have a high percentage of sugar.

The impact of El Nino

El Nino is expected to continue in 2016, which will make sugarcane areas for 2015-2016 crop continue to decline, especially in Mekong Delta region. For 2015/16 crop, an area of about 6.000 to 8.000 ha of sugarcane is expected to decrease (down 2-2.5%) compared to the 2014/15 crop year, partly because El Nino prolonged making sugarcane areas dry, partly because people switch to other crops with higher economic value. The decline in sugarcane areas contributes to the lower sugar supply than demand in the 2015/16 crop, making price rise about 10-12% compared to the previous crop.

The impact of La Nina

In the case La Nina happens, the average rainfall will be higher than normal, which may cause inundated and reduce percentage of sugar. The number of storm is also expected to increase with stronger intensity, which may spill large area of sugarcane, reducing sugarcane production.

Thus, sugar supply is forecasted to fall, while sugar demand grows well (forecasted growth of 6.7% in the 2015/16) could help sugar prices recover.

Impacts on Vietnam enterprises

When one phenomenon occurs, the sugarcane areas is expected to fall, making sugar companies not run at full capacity and not benefit from by-products, or need to import raw sugar for refining with a low margin. However, the forecasted sugar prices recovering may reduce adverse impacts from the reduction of the sugarcane areas above.

Related stocks: SBT, BHS, LSS, SLS, KTS

Textile-Low

Cotton plant has tropical origin with high demand of heat and sunshine, has high drought tolerant but needs proper water to ensure high yield and good fiber quality. The main producing countries are China, India and the United States.

The impact of El Nino

El Nino causes the rainfall increasing in the US's cotton areas and reduces the rainfall in India and Australia. Depending on the severity of the phenomenon, yield and quality of cotton will drop more or less.

The impact of La Nina

La Nina caused drought in most agricultural areas in the US, as well as causes heavy rains, floods and landslides in China and India. Therefore, yield and quality of cotton will be reduced.

Impacts on Vietnam enterprises

Either phenomenon has negligible impact on cotton prices because the supply continues to exceed demand approximately 1.8 times, inventory is still large, and artificial fibers price is currently more attractive as oil prices continue to remain very low. Cotton price in the 2015/16 crop is forecasted by USDA to decrease by 7.6% compared to the previous season.

Related stocks: TCM, TNG, GIL, KMR, GMC, NPS, TET, G20.

Animal Feed-

Main materials manufacturing animal feeds including corn, soybean, and wheat were imported from South American such as Brazil, Argentina.

Weak

Ảnh hưởng của El Nino

El Nino bring cooler and wetter weather to American. The weather impact positive on output of corn, soybean and wheat in these countries.

The impact of La Nina

Hotter weather and drought in American because of La Nina decrease output of corn, soybean, wheat down. Therefore, price of these agriculture products go up. However, the price increase slightly because of high carry-in stock. International Grains Council forecast that stock in 2015/2016 season is 213 million MT for wheat (30% of production), 206 million MT for corn (21% of production) and 44 million MT for soybean (14% of production).

Impacts on Vietnam enterprises

The increase/decrease in material price will expanse/shrink manufacturing expense of animal feed firms. DBC's operating profit margin is unchanged because the company adjust selling discount following the change of material price.

Related stocks: DBC

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