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Schroders
TalkingPoint

El Niño's economic impact: What the brokers say

A summary of brokers' El Niño research, assessing the effect the weather event could have on countries, companies, sectors, soft commodities and regional economies.

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Schroders

Summary

This report collates the analysis of some of the broker research that has been published about El Niño since 2014, when El Niño failed to materialise despite early warnings, to August 2015, when various meteorological offices from around the world indicate a strengthening El Niño that is likely to persist into the spring of 2016.

We summarise how an El Niño occurs and where its impacts are, before looking at the national level impacts (both from a physical and monetary level), impacts on soft commodities (production and price response) and the sectors (agricultural value chain, electricity generation, mining) and companies that may have exposure to it.

Our report finds that the impacts of El Niño at a national level will vary, predominantly determined by the contribution of primary industries (e.g. agriculture, mining) to a country's economy and that this can influence inflation and monetary policy as a result. At the soft commodity level most have demonstrated a price response to historical El Niño events; this is potentially greatest for palm oil given the geographical concentration of its production in the Pacific (though a substitution to soy oil tempers this impact). The global production of other agricultural crops will lessen the price impact and this may reduce the impact of El Niño on company margins within the food production value chain. The impact on utilities will depend on their geographical location, hydro generation will have the highest exposure which, in some countries, can cause increased demand for coal fired generation. There may also be impacts on the insurance and retail sectors.

Overall, though, it would appear that the major impacts are on palm oil production and the economies of some Pacific states.

However, as one broker notes, "history has warned that we shouldn't underestimate the influence of El Niño".

What is El Niño?

El Niño (and its converse La Niña) refers to a weather event caused by changes in oceanic water temperature within the Pacific Ocean. The first records of mankind observing these impacts dates back to the 1500s when Peruvian fisherman noticed that warmer waters off the coast of Peru were causing fish stocks to drop, whilst at the same time Peruvian farmers noticed increased levels of rainfall which boosted crop yields. However it wasn't until the 1960s that it was recognised that these impacts weren't just localised to Peru and had much wider impacts.

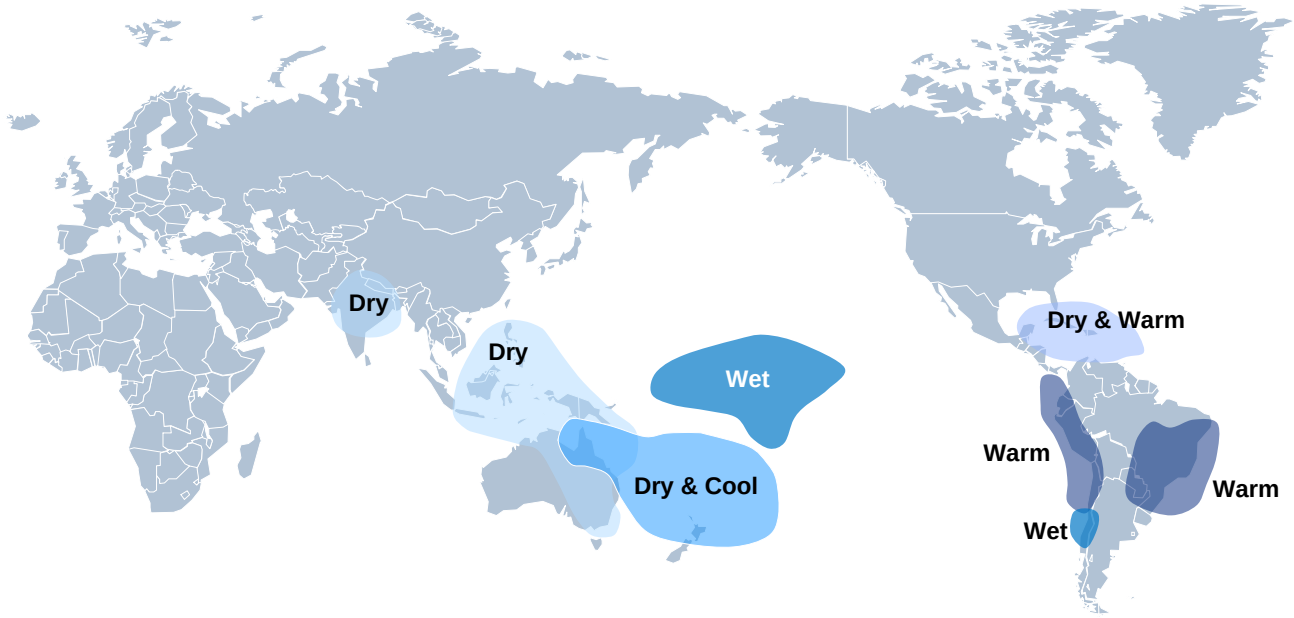
Today we know more about El Niño and its causes. Under normal conditions trade winds blow from east to west across the Pacific which creates a 0.5 metre sea level differentiation between Ecuador in the east and Indonesia in the west. The depressed water around Ecuador causes colder, deep sea water to rise to the surface. This cold water upwell, combined with trade winds blowing warmer water across the Pacific to Southeast Asia means that the waters in Southeast Asia are around 8°C warmer than those around Ecuador. This warm sea water evaporates, generating rain clouds which eventually bring moisture across the west pacific from July to October.

Under El Niño conditions, weak trade winds fail to create the difference in water levels between the west and east Pacific which means less cold water rises near Ecuador, as well as less warm surface water being blown across the Pacific. As a result, warm ocean waters (and the corresponding rain clouds) gather in the middle of the Pacific resulting in the west Pacific and India being drier than usual and warmer conditions in the east Pacific. La Niña is the opposite where stronger trade winds push more water to the west Pacific, bringing more rain than usual to that region of the world. El Niño events occur at irregular intervals of between two and nine years and can last between nine months and two years.

Figures 1 and 2 provide a visual summary of the global impacts of El Niño depending on whether it occurs during the summer or winter months (Table 1 provides a more granular breakdown of the impacts on three month intervals). The severity of these impacts depends on the strength of the conditions under which El Niño developed (e.g. the sustained difference between water temperatures or air pressure from the historical norm), but they can influence everything from the global water cycle and the spread of diseases to contributing to a rise in global conflict.

The unpredictability of El Niño was demonstrated in 2014 (when this paper was originally drafted), forecasters were predicting a 90% certainty that El Niño would occur; however, the looked for coupling between atmosphere and oceanic temperatures failed to follow the usual script and the shifts in regional weather didn't emerge. The latest forecast from 13 August 2015[1] predicts that there is a greater than 90% chance that a strong El Niño will continue through the Northern Hemisphere winter of 2015 – 16, and there is an 85% chance that it may last into the spring of 2016.

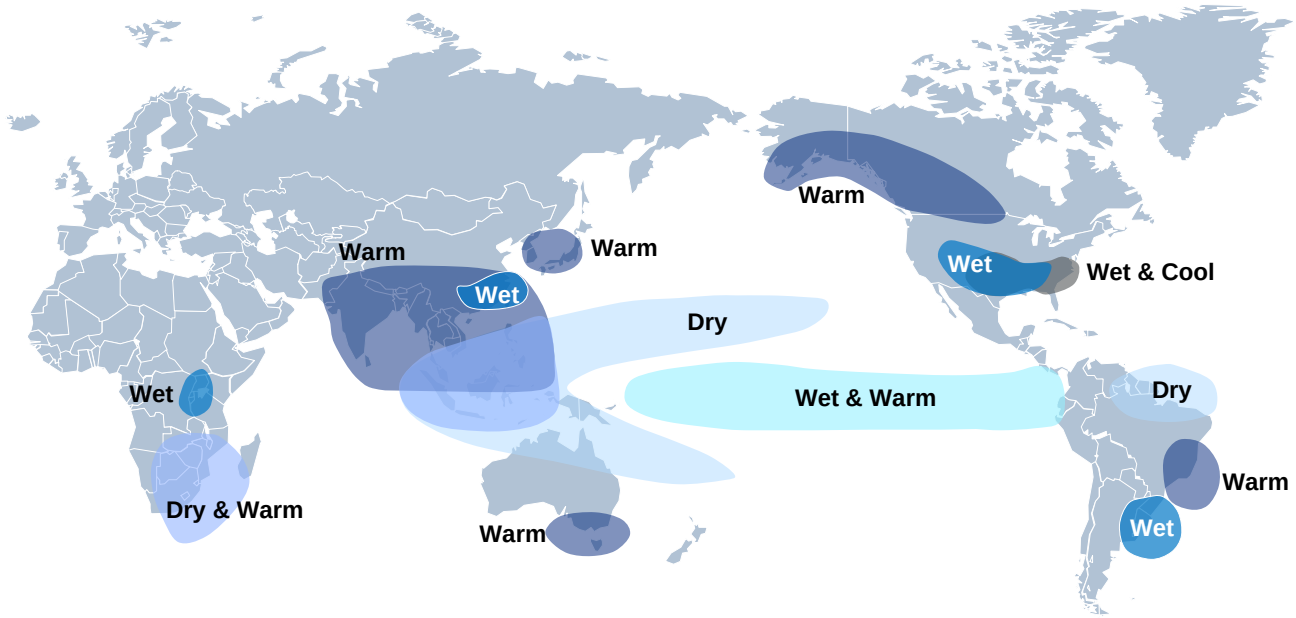
Figure 1: El Nino weather impacts from June to August



Source: "El Niño – the equity price disconnect", Barclays, 8 May 2014.

[1]Climate Prediction Centre, National Oceanic and Atmospheric Administration, 14 August 2015.

Figure 2: El Niño weather impacts from December to February



Source: "El Niño – the equity price disconnect", Barclays, 8 May 2014.

Table 1: El Niño effects depending on season

Months of El Niño occurrence	Impacts
March – May	Strongest effects are in the western Pacific ocean. Rainfall increases along the equator, but at 10 – 15 degrees north and south of the equator rainfall decreases. North Mexico and desert states of US get more rain. Northeast Brazil often stays drier than usual. Europe rains more on average
June – August	Eastern Indonesia often suffers droughts during El Niño. Rain zone moves east to islands along the equator in Pacific Ocean. Indian monsoon is often weaker (though not always)
September – November	Effects of El Niño tend to be strongest during this period. Almost all Indonesia, Philippines and eastern Australia are drier than usual during most El Niño events. Large parts of India are often drier than usual; Sri Lanka and some southern states get more rain. East Africa, Central Asia and Spain are also wetter than normal on average, as are Chile and Uruguay
December – February	Philippines, east Indonesia stay drier, Pacific islands along the equator remain wetter. Florida gets more rain than normal and this effect extends to other southern states of US and Mexico. South Africa is frequently drier as is the north coast of South America and Antilles. Uruguay and south Brazil see increased rainfall, along the coasts of Ecuador and Peru rainfall increases when the coastal waters heat up

Source: "Asia Palm Oil Sector: The El Niño wild card" Credit Suisse, 08 June 2015.

Country impacts

As shown, El Niño affects the weather over large parts of the planet and this can have a direct impact on their economies. Research by the International Monetary Fund[2] (IMF) has found that the impact of El Niño is smaller on GDP growth at a country level if:

– The geographical area of the country is large

– Primary sector (e.g. agriculture, forestry, fishing, mining) share of GDP is small

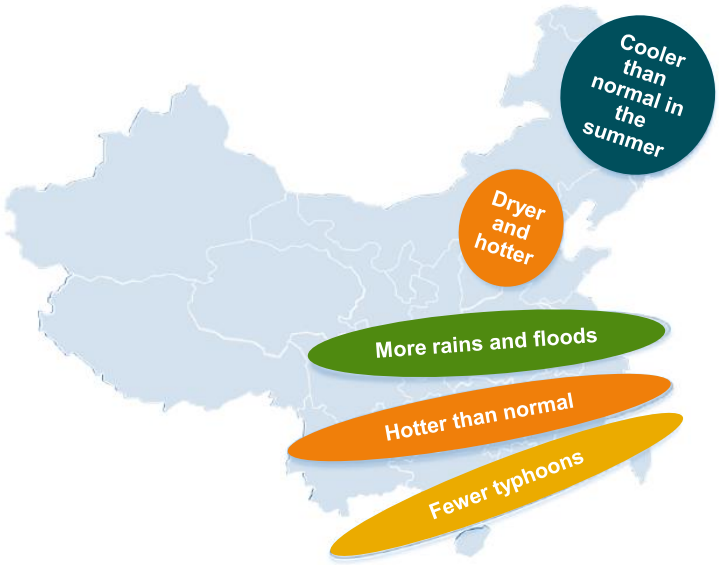
– The economy is more diversified

For countries where the share of food in the Consumer Price Index is large this will mean higher impacts on inflation, which may subsequently influence monetary policy and interest rates.

In this section we summarise the potential impacts at the country level.

China

Figure 3: El Niño impacts in China



Source: "China materials: Weak construction demand due to El Niño; Mixed impact from new commodity price estimates" Morgan Stanley, 23 June 2015.

Cooler summers in the north-eastern provinces (the country's largest producing region for corn and soybeans) can result in large scale crop damage from lower temperatures. In southern China rains are typically heavier during El Niño. The combined impacts tend to reduce agricultural production, driving up prices (though the wider global impacts of El Niño on agricultural production are likely to have a bigger impact on food prices in the country) which can drive food price inflation. The heavy rains will also decrease construction activity which can drive down steel prices. Heavier rains also increase the risk of flooding; in 1998 (a severe El Niño year) the total area affected by flooding in China was the worst in history, and even though typhoons will be fewer (but stronger), it is expected that there will be a spike in insurance property and casualty claims[3]. The warmer temperatures may also drive up residential power demand for air conditioning. A hotter summer could see residential power consumption increase 20 – 30%, which could drive a 7.5% increase in coal demand[4]. This increase in demand for air conditioning should be positive for copper prices.

[2]"Fair weather or foul? The Macroeconomic effects of El Niño" IMF Working Paper April 2015.

[3]"El Niño Approaching", Daiwa Capital Markets, 29 June 2015.

[4]"China Coal Sector: Asian Daily" Credit Suisse, 2 June 2015.

India

El Niño years typically see lower levels of rainfall in India as the monsoon is negatively impacted. 126 years of data from Skymet shows that 90% of El Niño years have led to below-normal rainfall and 65% to drought in India[5]. The Indian Meteorological Departments long range forecast for the 2015 monsoon season estimates that, across the country, rainfall is likely to be 88% of the long-term average though the distribution of the monsoon will not be uniform[6]. This lack of rainfall comes on the back of an intense heat-wave as well as a bad summer and winter agricultural season, a third consecutive bad season will severely impact agricultural production.

Research suggests that between a half and two-thirds of India's agricultural land lacks irrigation, and the impact of a poor monsoon is likely to be more on the summer crop (49% of total food production and about 7.5% GDP) than on the winter crop which is less dependant on rainfall and more dependent on the shortfall in rains and the subsequent impact on reservoir levels[7]. With 53% of India's workforce depending on agriculture, any negative effects on India's monsoons will have impacts on food price, the Consumer Price Index (CPI) (a 1% increase or decrease in rainfall results in a 0.37% increase or decrease in Agricultural GDP[8]) and on rural income and expenditure. If rainfall is deficient by 20% then food inflation is boosted 2.8% and headline Wholesale Price Index (WPI) and CPI by 0.7% and 1.3% respectively. Overall, a full-blown drought would knock 0.5% off GDP growth[5].

Changes in agricultural output will also affect those companies with exposure to rural incomes as well as the insurance and banking industries (agriculture and its allied sectors make up 12% of total bank credit[9]).

Thailand

At the time of writing Thailand is in the midst of its worst drought for 20 years, which could be exacerbated by El Niño. This has prompted the Thai agricultural ministry to advise farmers to delay planting of rice, which could see an increase in claims for compensation. Decreased rural income will adversely affect already weak demand in the provinces. Given that rice is a global commodity and Thailand has built up its rice inventory it is unlikely that prices will increase to compensate for decreased output and the loss in agricultural output could be valued at 0.15% of GDP[10].

Malaysia

El Niño events cause lower rainfall in Malaysia, which can exacerbate the impacts of an ongoing drought, potentially causing water rationing. Drier weather in Malaysia will increase the risks of forest fires as well as disrupt commodity transport due to water levels dropping in rivers, limiting barging capacity.

Indonesia

Indonesia has a large primary sector (about 18% of GDP) which means that its economy is particularly exposed to natural events. Research suggests that GDP falls by 1% at the end of the third quarter after an El Niño event[11]. Production capacity in Indonesia may also be impacted due to its reliance on hydro[12] (hydropower and other renewables made up 21.4% of Indonesia's 2010 energy mix[13]). Lower rainfalls increase the incidence of forest fires (which will impact Singapore where smog from Indonesia's forest fires drives up air pollution). The Indonesian government will also need to consider the impacts on food price inflation, its current policy is to achieve self sufficiency but with the advent of adverse weather it may need to reconsider this and begin agreeing on imports.

Australia

El Niño tends to decrease the mean amount of winter and spring rainfall in southern and central-eastern Australia, whilst southern Australia also experiences warmer days.

Drier weather will impact agricultural production, but as agriculture only accounts for 2% of Australian GDP and a strong El Niño may only reduce Australian agricultural GDP by 15 – 20% the overall impact of a strong El Niño on Australian GDP could be as little as 0.25%[14]. At the industry level a reduction in agricultural production will negatively impact crop haulage and volumes moving through ports as well as demand for agrochemicals. The more stable, drier conditions tend to be seen as favourable for construction, developers, coal haulage and insurance (bushfires tend to have less costly insurance claims than floods and drier weather tends to see a decrease in motor vehicle accidents). Dry weather is also positive for

[5]"Dry heat. India at risk of poor rains", HSBC Global research, Macro India Economics, 11 June 2014.

[6]"Long range forecast update for 2015 Southwest Monsoon rainfall", Indian Meteorological Department, 2 June 2015.

[7]"India Economics – Will Niño affect the pace of growth recovery?", Morgan Stanley, 9 June 2014.

[8]"El Niño 2014 – India impact", Nirmal Bang, 16 May 2014.

[9]"Watch out for the impact of El Niño on food prices" CICC Interest Rate Bi-weekly, 24 May 2014.

[10]"El Niño: rice planting delayed. Thailand in focus" Bank of America Merrill Lynch, 25 June 2015.

[11]"El Niño: stormy weather or hot air?" Bank of America Merrill Lynch, 5 June 2015.

[12]"An El Niño primer: a first take on assessing its market impact", Nomura, 8 May 2014.

[13]Global business guide Indonesia. www.gbgindonesia.com.

[14]"Australian Economic Comment: El Niño could cut GDP ¼%, but only modest risk" UBS, 17 June 2015.

mines, though if it extends to drought then this will reduce process water availability and increase the risk of disruption due to bushfire. In the retail sector the impacts are expected to be mixed, with beverage and home-ware demand increasing, and supermarkets will benefit from food price inflation, whilst winter clothing sales are likely to decrease. Warmer temperatures will also increase demand for air-conditioning, driving up electricity demand.

America

El Niño tends to bring warmer winters across the north of the US and stormier, wetter winters in the south. The south-west in particular is hoping for a severe El Niño in order to break the drought that has been gripping that part of the country. US wheat producers will benefit from higher global wheat prices due to output losses in Australia, Mexico and China. In the US Corn Belt, lower temperatures reduce water stress and have historically been beneficial to corn and soybean yields[15]. El Niño events have also resulted in less active Atlantic hurricane seasons and lower named storms, which should be positive for reinsurers and Florida home insurers.

In the past, El Niño has had a net benefit in the US, the warmer weather decreases energy demand during the winter (due to lower heating demands) and increases seasonal sales of retail products and homes, whilst agricultural production appears to improve. The 1997/98 El Niño had a net benefit of $15 billion on the US economy[16].

Colombia

El Niño causes drier conditions in Colombia and as a result will exacerbate the impacts of the lower than average rainfall that the country has experienced over the last few years, which has left reservoirs at 60.8% of total capacity, 2.3% down on year on year levels[17]. With around three quarters of Colombia's electricity production from hydro-electricity any negative impact on rains will affect productivity.

Brazil

El Niño typically brings drier conditions to the north of the country and wetter ones to the south. Much of the north of Brazil is already in drought (reservoir levels in Sao Paulo are at historic lows) and the prospect of El Niño brings with it the potential for water rationing. Better rainfall in the south will do little to ease the pressure on the power systems as the south only accounts for 7% of hydro storage.

If El Niño rains arrive in June or July this hampers the sugar cane harvest and reduces sucrose content, though the production of soybean and corn in the same area will increase.

Peru

The warmer ocean water around Peru during El Niño will contain fewer nutrients and cause fish stocks (especially anchovies) to migrate to cooler waters. The 1997/98 event caused an 80% decline in fish stocks and a 62% reduction in fishmeal exports[18] costing the Peruvian economy $3.5 billion. This year, despite the anchovies already having migrated, 86% of the quota has already been landed[19]. The increased rainfall will boost agricultural yields (mostly mangos, artichokes and grapes) though warmer winter weather will impact on textile retail inventories as fewer winter clothes are purchased.

Chile

El Niño is already bringing heavier rains to the south of Chile, which bodes well for hydro-electricity and ice melt refill. However, elevated rainfall levels can also make mountainous areas more difficult to access which will affect some mining operations.

Argentina

As with the south of Brazil, Argentina tends to get higher rains during an El Niño. This should be positive for sugar prices as above average rains will decrease crushing volumes. Argentinian farmers are already enjoying a bumper soybean crop as a result of El Niño; if El Niño events last beyond the spring of 2016 and into the summer then it will be another good year for Argentinian farmers who have seen soybean yields increase 15% during strong El Niño years[20].

[15]"Chemicals & fertilizers: El Niño?" CIBC, 28 May 2015.

[16]"El Niño: return of the 'little boy'?", HSBC, 22 May, 2014.

[17]"Colombia Power", BTG Pactual, June 2015.

[18]"El Niño phenomenon and the Peruvian economy", Credicorpcapital, 19 May 2014.

[19]"Austevoll Seafood" Nordea 19 June 2015.

[20]"LatAm Agribusiness: El Niño linger on, if confirmed is bullish for ARG farmers and sugar prices" Morgan Stanley, 12 May 2015.

Commodity impacts

The predominant impact of El Niño is on agricultural output, which typically show price increases as a consequence. Two factors, in addition to its severity, will affect the impact that El Niño will have on crop yields and prices:

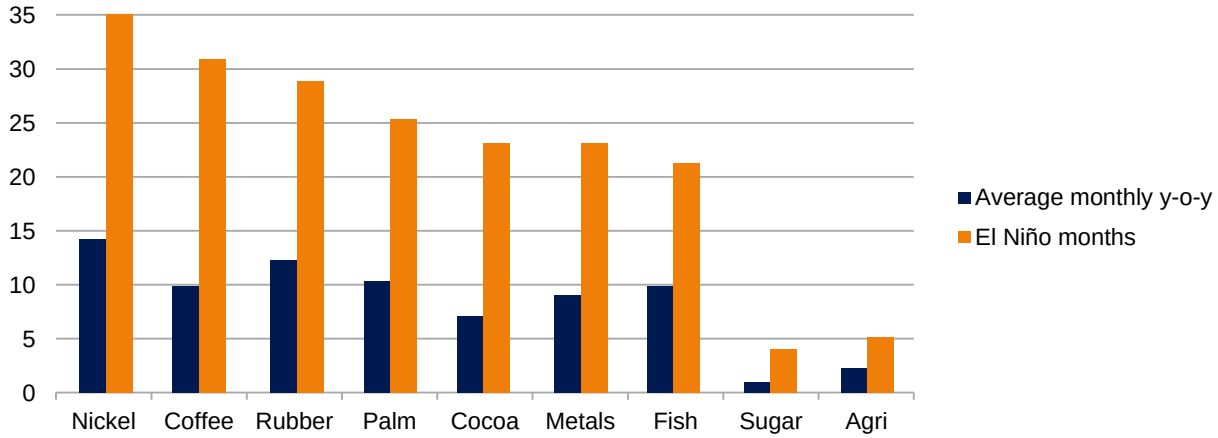
– Timing of El Niño event. The impacts will vary depending on what stage of a crop's lifecycle (e.g. sowing, growing, harvesting) it occurs at

– Geographic production range. Some crops, like palm oil, are concentrated in one specific region whereas others are grown globally. Globalisation of markets and trade should, all else being equal, diminish the impact of any region-specific decline in output

It would appear, though, that the El Niño impact tends to be underappreciated by the market. In 2014, the pricing for soft commodities indicated that the market was only pricing in a 20% probability despite meteorologists predicting a 60 – 70% probability of El Niño occurring[21].

In general it would appear El Niño creates a risk premium for commodities which gets reflected in prices and volatility, though only once an event is underway.

Figure 4: Price changes of key commodities due to El Niño (1995 – 2015)



Source: "He's back…what will be the impact of El Niño on Asia in 2015?" HSBC Global Research, 20 May 2015.

Below we provide some more detail on some of the commodities that may be impacted by an El Niño event.

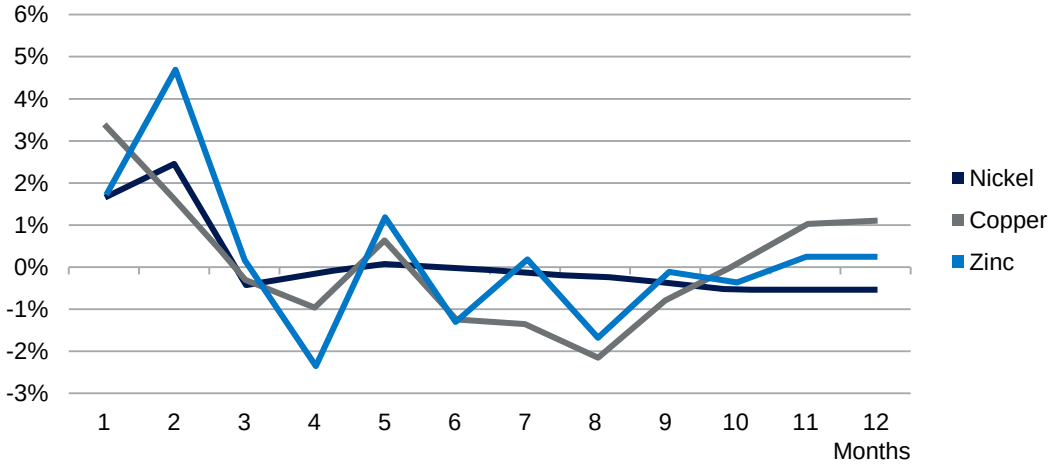
Base metals

The direct impacts of El Niño are most likely to be due to flooding of mines on the west coast of South America. Within the first month of a shock copper prices are lifted 3.4% and nickel and zinc prices 2%. Copper prices begin to fall after the first month and by the third month prices have retreated to the original price level. In the case of nickel and zinc, prices continue to rise after the first month with zinc rising by almost 5% in the second month of the shock. Like copper, zinc and nickel fall to their original levels by the third month[22] (as shown in figure 5).

[21] "El Niño – the equity price disconnect", Barclays, 8 May 2014.

[22] "When commos meet FX – Prepare portfolios for El Niño", Societe Generale, 13 May 2014.

Figure 5: The impulse response of a large El Niño shock on copper, nickel and zinc prices

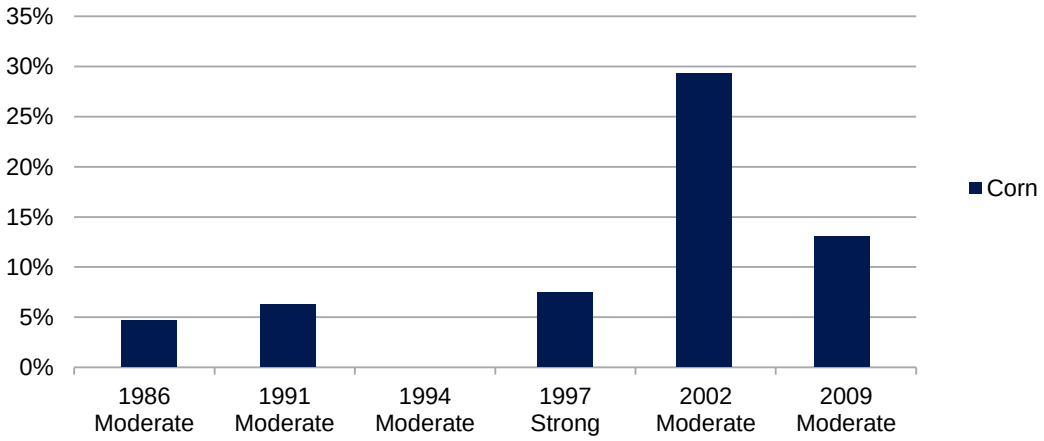


Source: "When Commos meets FX – Prepare portfolios for El Niño", Societe Generale, May 2014.

Corn

Corn is a crop that is grown around the world and so the impacts of El Niño in one region are unlikely to affect global prices. In China the lower temperatures in the north-east (the largest corn growing area in China) will decrease production, while in Brazil the results of more rainfall in the central southern area can lead to increase yields. In the 2006/07 weak El Niño event, corn production in Brazil increased 21% and it increased 10% during the 2009/10 moderate El Niño[23].

Figure 6: Maximum corn prices during El Niño years



"El Niño, the equity price disconnect", Barclays, 8 May 2014.

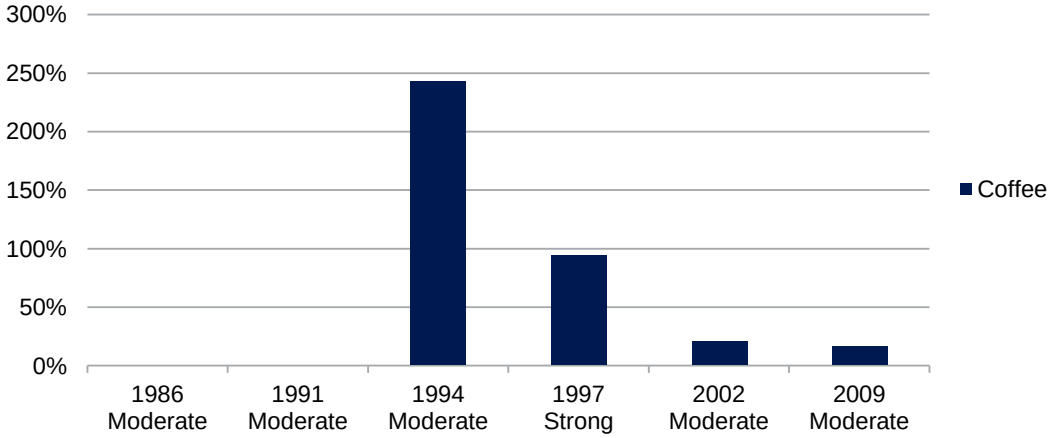
Coffee

Historically Arabica (the predominant grain grown in Brazil) prices have tended to fall after the shock and then only return to pre- El Niño event levels nine months later. The warm weather that El Niño brings in June to August aids the Arabica harvest as the crop solidifies and warmer weather protects against the spread of the roya fungus (which thrives in wetter conditions). However, drier El Niño weather in December to February may have negative impacts on the next Arabica crop, helping to support coffee prices as the event continues.

In Asia, the predominant coffee bean is Robusta, and the warmer drier weather tends to stunt the growth of Robusta beans, which drives down supply and raises prices.

[23] "What if El Niño comes in 2014? Chances are rising", Bank of America Merrill Lynch, 17 April 2014.

Figure 7: Maximum coffee bean price increase during El Niño years

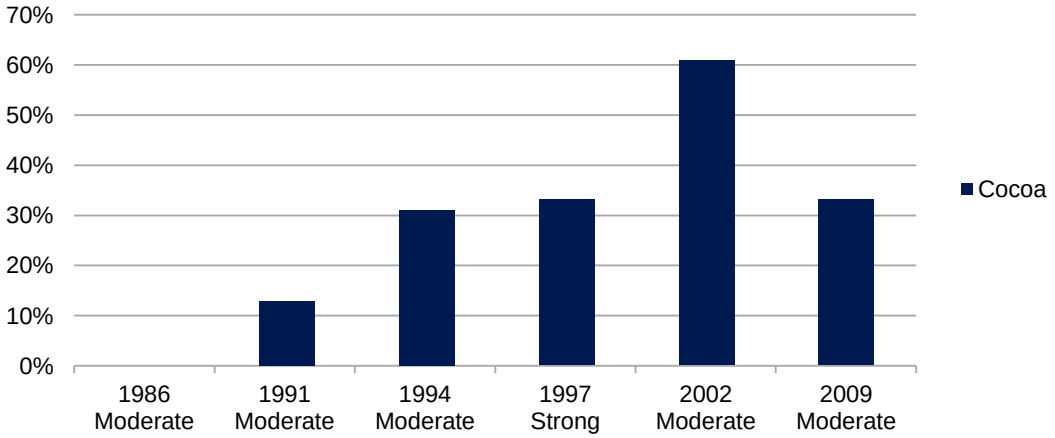


Source: "El Niño, the equity price disconnect", Barclays, 8 May 2014.

Cocoa

Cocoa output has been volatile for the last 30 years (regardless of El Niño) due to the majority of its production occurring in Africa which has geopolitical, funding and energy issues. Though Figure 8 would suggest there is a correlation between cocoa prices and El Niño events.

Figure 8: Maximum cocoa price increase during El Niño years



Source: "El Niño, the equity price disconnect", Barclays, 8 May 2014.

Palm oil

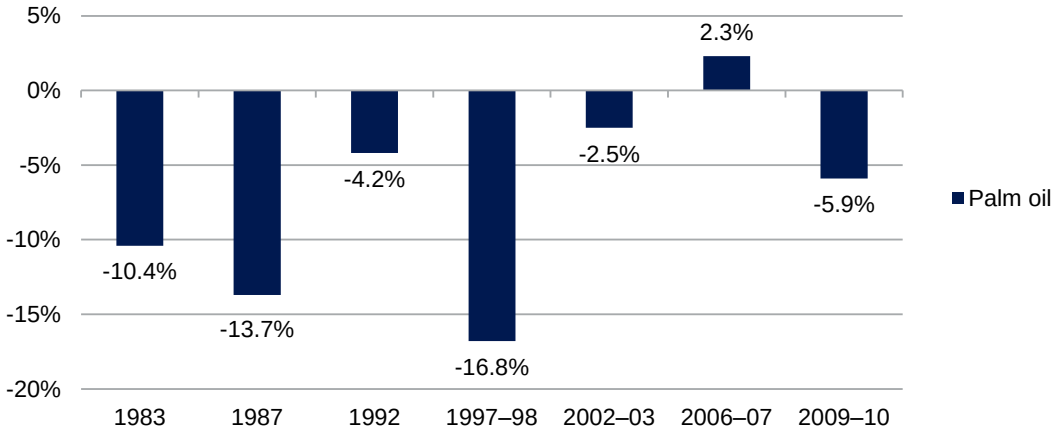
This is perhaps the crop with the biggest exposure to El Niño on account of 90% of production occurring in Indonesia and Malaysia. Analysis of two El Niño events (1997 and 2010) where lower than median rainfall lead to Crude Palm Oil (CPO) prices rising 19 – 114% as yields fell 4 – 17%[24]. Whilst palm oil plants are fairly resilient during an event, dry weather tends to impact production growth and yield trends in the following 12 months. If rainfall is 100mm less for two consecutive months this could reduce output by 5% cumulatively for the next three years. If there is a period of drought lasting more than six months, then this will reduce output by 20% in the following three years[25]. The increase in palm oil prices could positively impact 2016 earning forecasts by 20 – 40%[26]. Though any increase in palm oil prices tends to be capped by increased soybean production from the Americas, as palm oil is substituted by soy oil.

[24] "ASEAN Plantations – Putting a framework around El Niño", Citi, 14 March 2014.

[25] "El Niño – the equity price disconnect", Barclays, 8 May 2014.

[26] "Best ways to position for a 2015 El Niño" Bank of America Merrill Lynch, 11 June 2015.

Figure 9: El Niño impact on palm oil yields

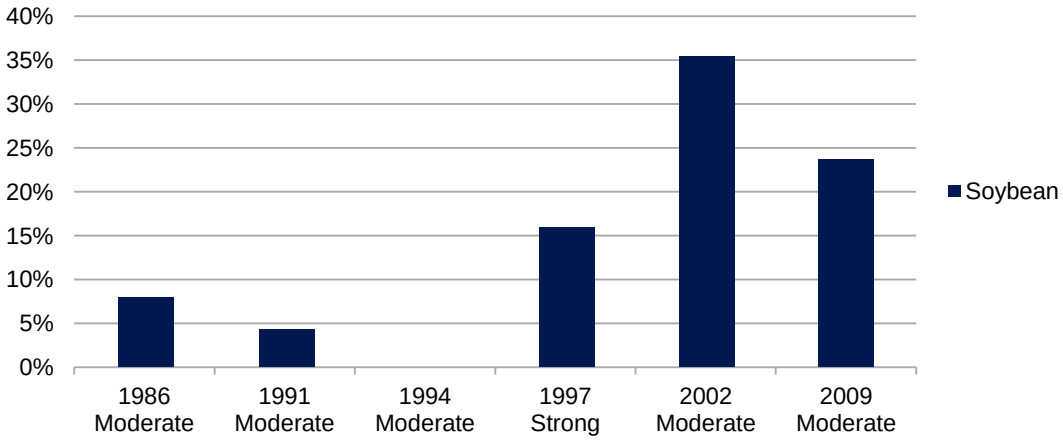


Source: "El Niño: More than just hot air?" Bank of America Merrill Lynch, 14 April 2015.

Soy beans

On average, global soybean yields increase 3.5% during El Niño events[27]. With 2015 soybean stocks-to-use levels at elevated levels following two consecutive record crops and with another record year of US Soybean planting in 2015, the positive impact of El Niño will only add to a global soybean glut and soybean prices are likely to remain capped as a result despite the increased demand as a result of higher palm oil prices.

Figure 10: Maximum soybean price increase during El Niño years



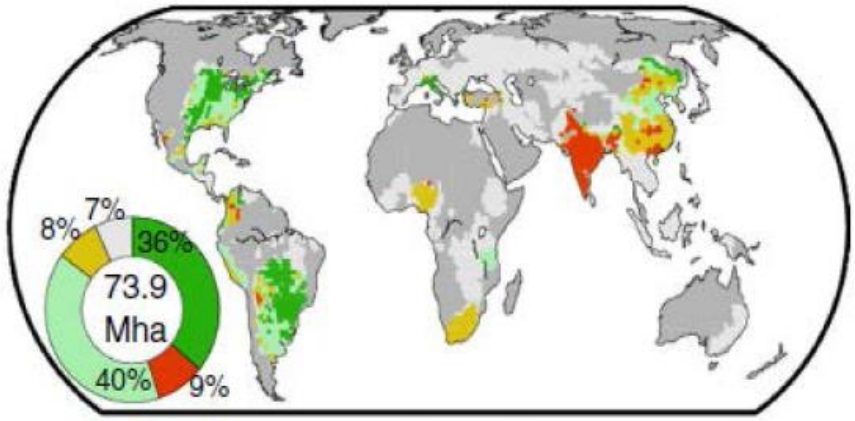
Source: Barclays "El Niño, the equity price disconnect", May 8 2014.

The global impact of El Niño on soybean production is demonstrated in Figure 11, which shows that yields will be reduced in China and India whilst additional rainfall will boost yields in the Americas (in Brazil, the weak 2006/07 event saw soybean production increase 6% and 20% in 2009/10; whilst in Argentina prices can increase 15% in El Niño years[28]).

[27] "El Niño: More than just hot air?" Bank of America Merrill Lynch, 14 April 2015.

[28] "LatAm Agribusiness: El Niño lingers on, if confirmed is bullish for ARG farmers and sugar prices" Morgan Stanley, 12 May 2015.

Figure 11: El Niño and impact on global soybean yields (green denotes positive impact, red/yellow denotes negative impact)



Source: Izumi, 2014, "Impact of E Nino Southern Oscillation on global yields of major crops" in "El Niño: More than just hot air?" Bank of America Merrill Lynch 14 April 2015.

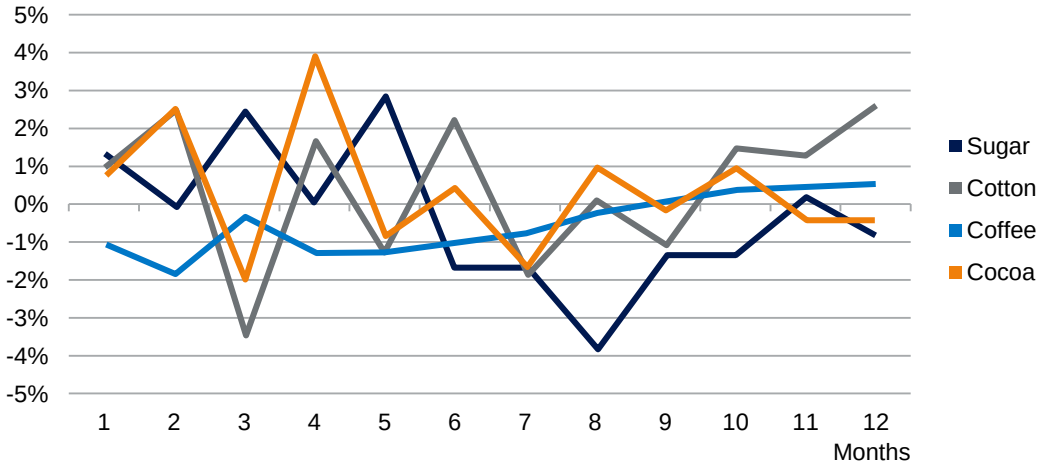
Sugar

El Niño's impacts on sugar production are greatest when it brings too much rain to Brazil and drought to India (which, together, produce 38% of the world's sugar). India's sugar production is for its domestic market as it has the highest per capita sugar consumption in the world (consuming 15% of the world's sugar). In Brazil, El Niño means fewer days for crushing and causes lower sugar content in the cane as the wet conditions cause the plant to store less sugar.

In the weak 2006/07 El Niño, sugar and ethanol production volumes increased more than 10% year-on-year; whilst in the 2009 El Niño, which was more severe, sugar production volumes came in 10% below initial expectations[29].

Sugar prices tend to respond positively to El Niño in the first month and will then be volatile for the following six months, with any previous problems in the Brazilian crop tending to amplify this price support.

Figure 12: The impulse response of a large El Niño shock, on sugar, cotton, coffee and cocoa prices



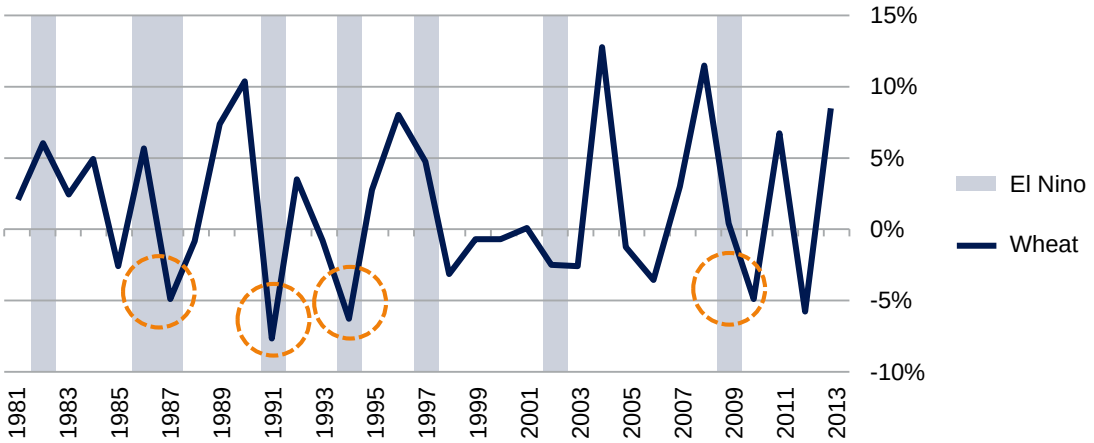
Source: Societe Generale "When commos meet FX – Prepare portfolios for El Niño" 13 May 2014.

Wheat

Wheat output is volatile regardless of El Niño due to weather volatility. However El Niño events have coincided with the largest drops in wheat growth in the past 30 years. Wheat production in India (3rd largest producer) and Australia (7th largest producer) will be impacted by El Niño, though the globalisation of wheat production can mitigate the impact of reduced yields on global supplies.

[29] "What if El Niño comes in 2014? Chances are rising", Bank of America Merrill Lynch, 17 April 2014.

Figure 13: Production growth decline for wheat in El Niño years



Source: "El Niño, the equity price disconnect", Barclays, 8 May 2014.

Sector exposure

Our analysis of the research suggests that there are two main sectors (based on the amount of coverage) that analysts consider to be impacted by El Niño the most: electricity generation (predominantly in South America) and agriculture (especially palm oil production). To a lesser extent there was also mention of retail sectors where unseasonable weather will impact demand for seasonal products whilst food price inflation will benefit food retailers. There was also mention of other elements of the agricultural value chain (e.g. agricultural chemicals or those companies that will be exposed to higher agricultural commodity prices potentially reducing their margins).

Utilities

The impact of El Niño on this sector in South America is dictated by prevailing meteorological events prior to El Niño. Currently lower-than-average rainfall in much of South America has meant that reservoirs are low and so hydro-electric generation capacity is restrained. Should El Niño occur, then those countries on the west coast of South America (e.g. Chile, Peru and Ecuador) are likely to get increased rainfall which will benefit companies with exposure to hydro-electricity production.

In Brazil, the northern part of the country could get less rainfall, but southern Brazil tends to get more rainfall and, given the ongoing drought in the country, an El Niño event will benefit southern electricity generators with exposure to hydro. Other considerations such as intra-regional electricity production selling strategies and commercial commitments should also be considered alongside the impact of El Niño.

The influence of El Niño on Indian monsoons may reduce hydro-electricity generation, resulting in an increase in demand for thermal generation (e.g. coal-fired capacity).

Warmer winters in America will decrease heating demand during the winter, whereas above-average temperatures around the Pacific will increase air-conditioning demand; both will have direct impacts on electricity demand.

Table 2: Utility companies mentioned in broker research on El Niño with a market cap of greater than £1bn

Country	Company	Company Description
Brazil	Aes Tiete	Hydroelectric power generator
	Cia Energetica de Sao Paulo (CESP)	Primarily involved in the planning, construction and operation of electrical energy generation and distribution infrastructure (including hydro)
	CPFL Energia	Electricity generation (hydro, small scale hydro and thermal power) and distribution
	Cia Energetica Minas Gerais (CEMIG)	Electricity generation (primarily through hydro) and distribution
	Tractebel Energia	Operates hydroelectric and thermal plants in southern Brazil
	Cia Paranaense de Energia (Capel)	Operates 15 hydroelectric plants and three thermal plants as well as involvement in transmission and distribution
Chile	Colbun	Electricity generation (hydro and thermal) and transmission and distribution. Also transports and markets natural gas
	Endesa Chile	Electricity generation (hydro and thermal) and transmission and distribution.
	Aes Gener	Electricity generation (hydro and thermal) and transmission and distribution.
	Enersis	Electricity generation (hydro and thermal) and transmission and distribution.
Colombia	Celsia	Operates thermal, micro-hydro and running water projects
	Isagen	Electricity generation (hydro and thermal) and transmission and distribution.
Philippines	Aboitiz power	Hydroelectric power generation

Food producers

Within the research, the predominant focus has been on El Niño's impacts on CPO production as other agricultural commodities are more globally diverse in their production and so global prices will be less affected by El Niño. The materiality of a palm oil company's exposure to El Niño is determined by two factors:

– A company's vertical integration through the palm oil value chain

– Diversification into other agricultural crops

For example, KL Kepong and IOI Corp (both vertically integrated palm oil companies) will see the improved upstream performance (due to higher CPO prices) neutralised by poorer downstream margins, whereas Noble, Wilmar and Golden Agri have increased their exposure to sugar since the last El Niño, improving their outlook.

Table 3: Agricultural production companies mentioned in broker research on El Niño with a market cap of greater than £1bn

Listing Country	Company	Company Description
Brazil	Sao Martinho	Harvests and processes sugar cane and ethanol
Australia	Graincorp	Grain and bulk commodities handling and storage
Singapore	Noble	Global supply chain management services. Particular focus on coal, coke, soybeans, iron ore, oil and gas, petrochemicals, sugar and ethanol
	Wilmar International	Involved in palm oil production, refining, processing and merchandising. As well as manufacturing and distributing own fertilizers
	Bumitama Agri	Primary business is cultivation and harvesting of palm oil trees in Indonesia and the processing of palm kernels to CPO
	First Resources	Primary business is cultivation and harvesting of palm oil trees and the processing of CPO
	Olam	International integrated suppliers of raw and processed agricultural commodities
	Golden Agri Resources	Vertically integrated CPO producer as well as refining of CPO for food products
Malaysia	IOI Corporation	Cultivates and processes oil palm and rubber
	Sime Darby	A quarter of SIME's revenues are in plantations, with other revenues sources being property development, heavy equipment and motor vehicle distribution
	Kuala Lumpar Kepong	Produces and processes palm products, natural rubber and cocoa
	Felda Global Ventures	Ag-commodities company. Produces oil palm, rubber plantation, soybean, canola, oleochemical and sugar products
	Genting Plantations	Operates plantations as well as managing golf courses and property, providing palm oil mill management services, trading in rubber wood and fresh fruit bunches
Indonesia	PT Astra Agro Lestari	Vertically integrated CPO company
	Indofood Sukses Makmur	Manufactures cooking oil, wheat flour, coffee, noodles, baby food and food seasoning
US	Archer Daniel Midlands	Procures, transports, stores, processes (oilseed, corn, milo, oats, barley, peanuts, wheat) and merchandises agricultural commodities and products

Other sectors: Chemicals, mining

Those companies with exposure to the agricultural value chain (e.g. logistics, fertilisers, seeds) will also be affected, to some degree by the impacts of El Niño. Logistics companies may see volatility in volumes transported due to variation in yields, whilst fertilizer and pesticide providers may see product demand vary depending on when El Niño impacts during a crop's life cycle (e.g. If the Indian monsoon failure reduces crop establishment then there will be less demand for pesticides or fertilizers later in the crop life-cycle).

There was also some reference to mining, highlighting the potential impacts on operating conditions (worse in Chile due to more rains or better in Australia due to less rain) or increase in demand for products (e.g. less hydro capacity could increase demand for Indonesian and Australian coal imports to India).

Table 4: Other companies mentioned in broker research on El Niño with a market cap of greater than £1bn

Country	Company	Company Description
Australia	Wesfarmers	Manufactures fertilizers and chemicals (3% revenues) as part of diverse business activities (e.g. retail – 92% revenues), mines, insurance.
	Incitec Pivot	Fertilizer manufacturer and supplier (as well as explosives products and services)
US	Monsanto	Provides agricultural products for farmers, predominantly seeds.
	Potash Corp	Fertilizer manufacturer
Switzerland	Syngenta	Produces crop protection products and seeds
Indonesia	PT Tambang	Coal mining
	PT Adaro energy	Coal mining
	PT Indo Tambangraya	Mineral exploration and production