

# The outlook for commodity prices and implications for New Zealand monetary policy

---

12 April 2011

by Richard Sullivan and Tim Aldridge

## Executive Summary

This paper interprets recent events and thinking in commodity markets and evaluates what these mean for New Zealand and monetary policy.

We conclude demand is underpinning commodity prices, creating a structural shift in the terms of trade of commodity exporters like New Zealand. Against this backdrop, idiosyncratic events such as weather-related crop failures and changes to government policies have pushed prices to historical highs. Supply responses will be relatively slow, implying prices are likely to stay high over the short to medium term, if a little lower than current levels.

New Zealand's agricultural export prices are likely to remain at elevated levels for some time. Demand is underpinned by urbanisation and wealth growth in developing countries, especially China. However, there is potential for near term price falls as supply becomes less weather disrupted.

The appropriate monetary policy response will focus on the inflationary pressure that arises, not the terms of trade shift in itself. Higher terms of trade will contribute to appreciation of the exchange rate, facilitating the necessary adjustment in the real exchange rate via the nominal exchange rate rather than via rising inflation.

Medium term inflation remains the Bank's focus. The Bank needs to be cautious that a terms of trade increase does not lead to increases in inflation expectations. For example, households and firms might use the income boost from higher commodity prices and exchange rates to bring forward consumption and investment, or increase borrowing. Consequent pressure on resources within New Zealand would lead to more inflationary pressure and monetary policy would counteract any rise in inflation expectations.

However, large uncertainties surround the outlook and underlying drivers for prices. One thing we do know is that the outlook will remain uncertain. History shows it is fiendishly difficult to predict the future path of commodity prices.

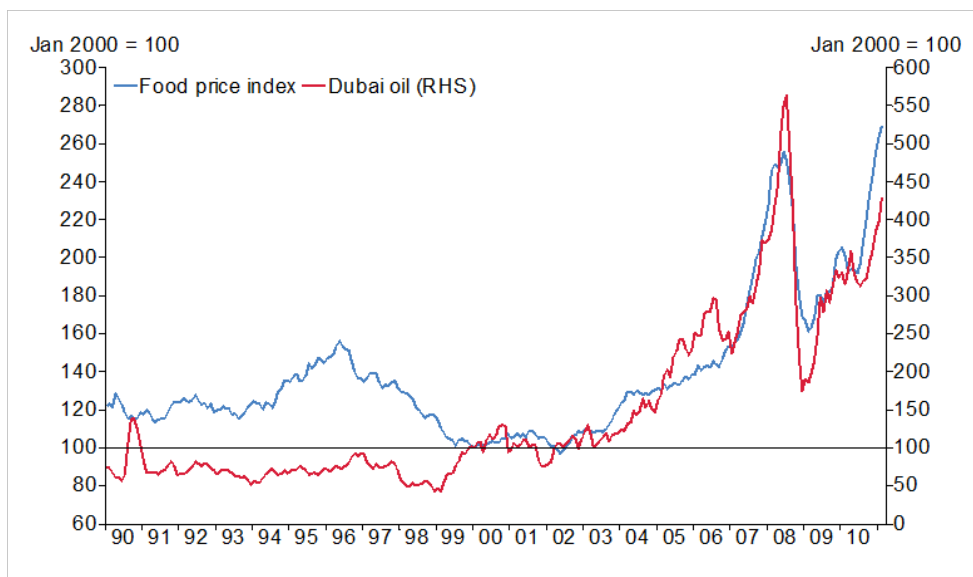
## What's been going on?

Global commodity prices have experienced the largest boom in more than 100 years. While hard commodities have seen the biggest surge, agricultural commodity markets have also seen a fundamental change. Japanese financial conglomerate Nomura commented in 2009 that new and increasingly powerful influences acting on both sides of the food supply-demand equation had changed the dynamics of soft commodities permanently. At the time, Nomura speculated that it may not take much of a disruption in food supply to trigger another surge in prices. And

indeed, food prices surpassed the 2008 record level in January (figure 1), boosted by supply disruptions, particularly in grain markets. Weather related supply constraints are a short term factor, causing significant spikes in prices. Meanwhile, underlying demand has remained strong for all commodities, influenced heavily by rapid growth in wealth and urbanisation in developing Asia, and this has been underpinning food prices. For example, meat prices, which have been the weakest performer, have nearly doubled since 2000.

In contrast, oil prices haven't increased to their previous peak (figure 1). This is notwithstanding a lack of growth in supply over the past five years. The relative underperformance of oil prices may be due to the slow recovery in advanced economy industrial production, which remains well below its 2007 peak. For example, United States industrial production is still 5 percent below its peak in mid 2007, while other large advanced economies remain even further below peak levels.

**Figure 1: Food price index vs oil prices**

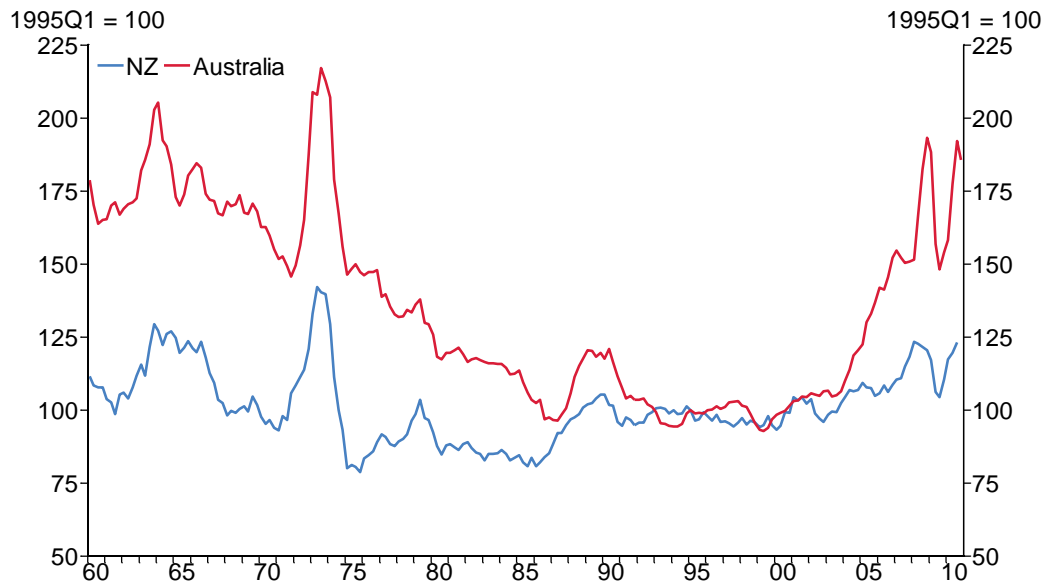


Source: United Nations Food and Agriculture Organisation

Unlike food consumption, which increases at least as fast as population growth, the positive effect of economic growth on oil consumption is moderated by technological progress, meaning the amount of oil required to produce one unit of real GDP (globally) is usually declining.

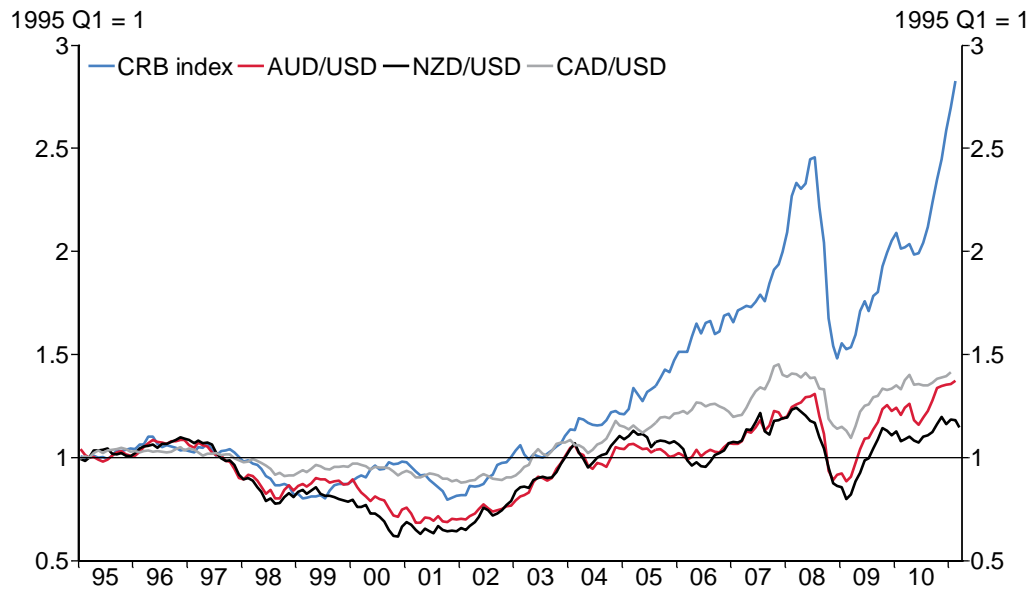
While New Zealand's terms of trade has risen 32 percent since 2000, this is dwarfed by the run-up in the Australian terms of trade (figure 2). Australia is benefitting from a high level of hard commodity prices, which are even more sensitive to developing Asia and China than the agricultural commodities New Zealand is producing.

**Figure 2: Terms of Trade – Australia and New Zealand**



The high price of commodities has had a significant effect on the value of key commodity exporters' currencies. Figure 3 shows that while there has been significant appreciation in the commodity currencies, this has been far outstripped by the growth in commodity prices (as measured by the CRB index), suggesting that only some of the price strength can be explained by weakness in the USD.

**Figure 3: Commodity currencies (CAD, AUD, NZD) vs CRB**



To understand the outlook for commodity prices, we need to look into demand and supply conditions in more detail.

### **Is speculation causing higher prices?**

There is little evidence to support the theory that financial speculation on commodity markets has been a major cause of the increase in prices. Commodity markets are now so large it is difficult to see how any one speculator could profit by driving the price away from fundamental levels.

Financial speculation involves taking a long position on a commodity using futures or options contracts. Since for every long position there must be a corresponding short position, unless the financial speculator actually takes delivery of the commodity, no net physical demand is added. While speculation does affect prices in short term, this is likely to be due to the extra information speculators bring to the market, which generates more efficient price discovery. Financial speculators enable producers to hedge their price risk, which they would otherwise have to hold expensive capital against.

While the share of non-commercial trades in key futures markets like corn soybean and wheat more than doubled to around 30 percent over 2005-2009, studies by the IMF have failed to find evidence that speculators have had any significant influence on commodity prices. Nonetheless, concern that excessive financial speculation was contributing to higher food prices led some countries to ban futures trading in commodities.

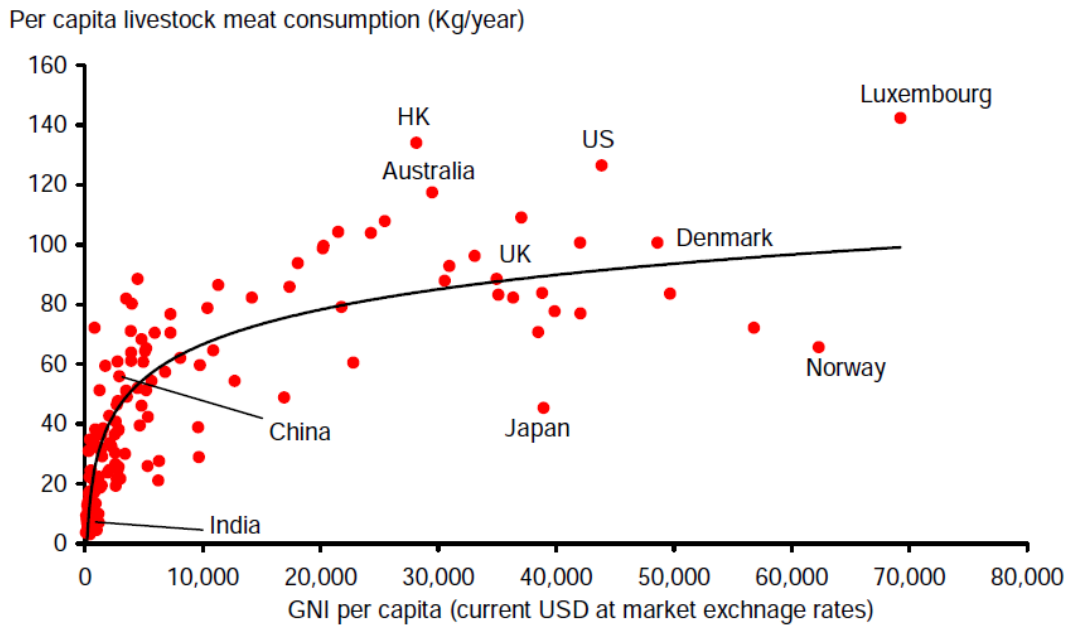
In contrast, the World Bank concluded that speculation played a non-trivial role in the run up of commodity prices in 2008, though it is likely that physical speculation (i.e panic hoarding in developing countries) was the main contributor, rather than financial speculation. However, inventory data shows that stocks of many agricultural commodities are currently near record low levels, indicating that hoarding is not the cause of current high prices. It is possible that long non-commercial positions may have been taken as hedges against rising CPI inflation.

## **Demand**

Increasing food demand has been largely driven by demand from developing economies. This is due to both rapid income and population growth. As countries grow wealthier, the demand for food increases. Much of the growth in the world economy since 2000 has been due to China growing from a predominantly low income economy to being one with a large middle class and average incomes rising towards the global average.

### **Price growth linked to higher grain and protein demand**

Growth in food demand is fastest in the early stages of a country's development. As countries become wealthier, consumer preferences switch from merely more food, to higher nutrient food. So in the initial stages of development a country may consume higher quantities of rice, but as wealth continues to grow, other grains, such as wheat, become more popular, and then dairy and meat become larger parts of the national diet. Eventually food demand becomes dictated more by population growth than income growth.

**Figure 4: Income v meat consumption**

Source: FAO, World Bank and Nomura Global Economics.

A recent Nomura report shows a case study of how diets in Taiwan evolved as wealth grew and urbanisation accelerated along the path China is expected to take:

“In Asia, the changing pattern of Taiwan’s per capita food consumption over the past half century is an interesting case study, given that the Taiwanese diet is similar to that of the mainland Chinese. From 1985 to 1990, Taiwan’s GNI per capita jumped from USD3,368 to USD8,325 (compared with USD3,427 in China in 2008), and during this period Taiwan’s total per capita consumption of rice and vegetables declined, but consumption of meat, milk and fruit all increased substantially.”

**Figure 9. Average per capita annual food consumption (kilograms)**

Period	Grain	Vegetables	Meat	Milk	Fruit	Memo item: GNI per capita (USD)
<b>Taiwan</b>						
1975	162	110	27	15	55	979
1980	134	130	43	25	70	2,394
1985	110	103	56	32	112	3,368
1990	102	93	63	43	132	8,325
1995	100	102	73	59	137	13,103
<b>China</b>						
2000	265	132	39	3	46	934
2005	376	168	48	11	62	1,734
2008	444	171	42	15	65	3,427

Source: Taiwan Council of Agriculture, *China Statistical Yearbook* and Nomura Global Economics.

Worldwide, a surge in demand for meat and dairy can have large multiplier effects on the demand for grain and water, given that it takes, on average, 3kg of grain and as much as 16,000 litres of water to produce 1kg of meat (this assumes most meat will be produced in feedlots). Hence, when current grain prices are elevated the cost of producing meat and dairy rises. This represents a windfall gain to producers like New Zealand where grain inputs are relatively low.

## Demand shift likely to be structural

The demand curve for a number of agricultural markets has seen a structural shift – higher and more inelastic – with emerging market demand and policy changes eroding world inventory levels at a rapid rate. The Dutch agricultural financing cooperative, Rabobank, formed this view after observing downward sloping forward curves in almost all agricultural markets at some point during 2010. Rabobank said this reflected the markets' needs for delivery of increased near-term supplies and the encouragement of increased production next season.

Moreover, the Australian forecasting agency ABARES agrees. Its view encapsulates strong economic growth, and hence commodity demand, to continue in developing economies, particularly in China and India. Its projection is for export earnings for Australian minerals and energy commodities to rise in real terms over the next five years.

## Supply

Supply of agricultural commodities will respond to high prices. However, biological constraints limit the extent to which increased supply can match increasing demand and curb price increases. For example, Fonterra estimate that annual world milk production can grow at around 2-3 percent even with growing production in non-traditional areas. Fonterra also comment that this is barely enough to keep up with consumption growth over the next few years.

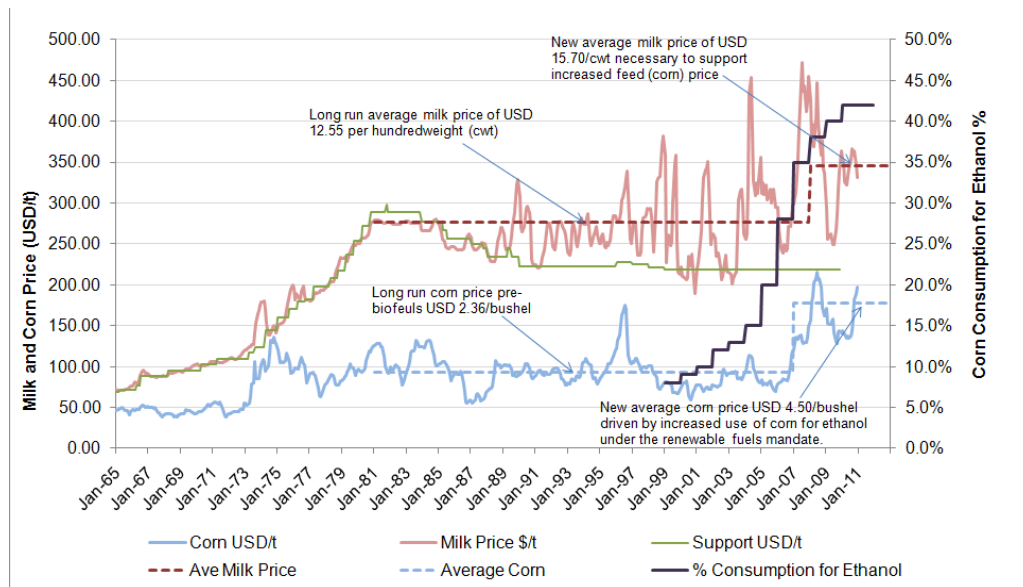
Recent spikes in prices have been induced by weather-related shortages in grains. Wheat prices rose markedly early in 2010 when supplies in Russia were severely dented by drought and fire. Export restrictions from Russia and flood-damaged Australian crops exacerbated the situation. The La Nina phenomenon is generally associated with lower crop yields worldwide and was prevailing through 2010/early 2011. Subsidies for maize biofuels in the US have further reduced supplies for grains and feed markets, underpinning prices for substitute products like soymeal and skim milk powder.

## Biofuels

An important factor behind the rapid rise in food prices is the use of food inputs for non-food purposes, reducing supply to world food markets. Biofuels have been a major driver of increased grains and oilseeds consumption and consequent price rises, over the past several years. High oil prices and the perception that biofuels produce lower carbon emissions have promoted greater biofuel use and led many governments to subsidise production. This is particularly the case in production of corn, soybean, and sugarcane.

Currently, 40 percent of United States corn production is used to produce ethanol, which is blended into petrol and diesel. A 2009 UN study found that the corn equivalent of the energy used on a few minutes drive could feed a person for a day, and that a full tank of ethanol in a large four-wheel drive sports utility vehicle could feed one person for almost a year. Because of the rise in importance of biofuels, the link between food prices and oil prices is becoming stronger. As the price of oil rises, biofuel production becomes more economically viable, and so food prices rise.

**Figure 5 : Increasing use of corn as fuel raises prices**



Source: Fonterra

## Agricultural policy

Reforms to agricultural policy in North America and the European Union reducing producer prices have seen production fall and inventories reduce to very low levels over the last decade. The effect has been most stark in dairy where stocks of milk powder and butter fell dramatically between 2002 and 2008, contributing to the run-up in prices over that time. For example, intervention stocks of milk powder held by the US and EU fell from more than 700,000 tonnes to less than 50,000 tonnes in 2006, and have remained low since.

EU suppliers responded to a reduction in subsidised prices in 2003, and production of milk within the EU has dramatically reduced, with similar effects occurring in other agricultural markets.

## Supply disruptions exacerbating cyclical swings

The major supply side effects that are providing sizeable upward shocks to commodity prices at present are temporary and relatively short-term in comparison to demand changes.

Rabobank note that a lasting rally in agricultural commodity prices into 2011 and beyond is likely as pressures in agricultural markets and constrained resources, including land, farm inputs and credit prevent an optimal supply response to higher prices. Further, low inventory levels and robust demand growth will support agricultural prices. Rabobank also note that risks are skewed upwards as sensitivity to any weather or policy supply shocks has been heightened.

The ABARES assessment of the grain situation is for a return to normal production, alleviating some supply issues in the near term. Its assessment is based on predictions of the La Nina event of the past year dissipating by the middle of this year. They note that world prices for grains and oilseeds increased substantially in 2010 and have remained high in early 2011, primarily because of shortfalls in production in some of the major exporting countries. Lower production combined with strong demand has also resulted in a general drawdown in global grain and oilseed stocks, particularly for corn, which is the main feed grain used in the world.

ABARES expect grain and oilseed producers to respond to current high prices by increasing production next season, putting some downward pressure on world prices. For example, in

Russia, wheat production is forecast to increase by 30 per cent on the assumption of a return to more favourable seasonal conditions following the very dry weather conditions last season that resulted in a high rate of crop abandonment.

## Outlook

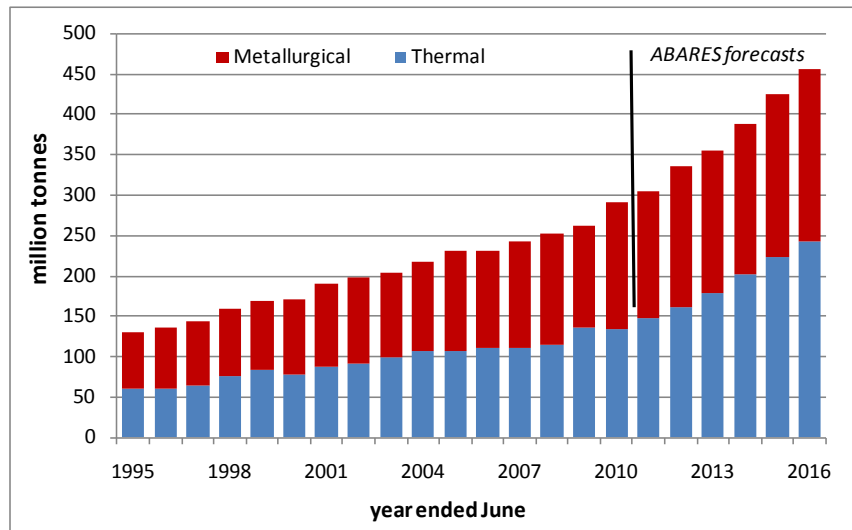
Global demand for commodities and natural resources is expected to continue to increase as the population continues to grow, migration to cities accelerates, incomes rise, and consumer preferences change. In the emerging world, particularly China and India, a rapidly growing number of people are demanding more goods as they raise their standard of living. Even with reduced growth outlooks for some economies, the rate of growth remains staggering by developed world standards, suggesting demand will continue to rise, underpinning prices for some time.

Meanwhile, the increase in supply of these goods is more ambiguous and is impacted variously by politics, diminishing mature sources, investment in new capacity, biological limits and weather. Nevertheless, the supply will increase to meet demand, especially if the price incentive is high. The unknown is how long before supply and demand growth are in balance.

**Hard commodities** – The demand for hard commodities (like metals and wood) is linked to investment in infrastructure and industrialisation and will go hand in hand with economic growth and development. Hence, it is likely that demand will continue to rise faster than increased supply, keeping prices elevated. ABARES expects that metal and mineral export prices will increase around 5 percent next year, following an expected 30 percent rise in the year to June 2011. Should government policy in China and India slow down the urbanisation rate, price gains beyond that will be limited. However, if anything, current policy in China is encouraging greater urbanisation – especially of the interior.

**Energy** – Similarly, energy prices will be linked to growth, development and urbanisation, particularly in developing Asia. Increased industrialisation and uptake of consumer electronic goods will spur energy intensiveness and electricity consumption. At present it is likely that electricity will be generated by higher fossil fuel consumption in developing countries, at least initially while they are relatively unconstrained by emissions targets. Similarly, greater use of private motor vehicles will grow fuel consumption. ABARES expects Australia's energy export prices to rise around 10 percent next year (not including geopolitical-induced spikes). This is despite roughly AUD60 billion of investment in mining capacity (largely coal and LNG). The major threat to increased prices is better energy efficiency and higher supply from previously marginal sources such as oil shale.



**Figure 5: Volume of coal exports from Australia**

Source: ABARES

**Agricultural commodities** The current La Nina episode has been weakening since the start of the year and is projected by many meteorological associations to peter out around July, with the prospect of grain crop yields returning to normal. A significant drop in grain prices is therefore expected later in the year, and is likely to flow through to other agricultural commodity markets. Nevertheless, the outlook for agricultural prices remains relatively positive.

The industrialisation and urbanisation trends mentioned above will increase worldwide demand for proteins and high quality cereals, like wheat. In the short-to-medium term this demand is likely to outstrip potential supply growth (rebound from adverse weather events notwithstanding). Herd rebuilding in Australia and the US will keep meat supplies relatively constrained for some time, while European production of agricultural products is likely to remain subdued until the next round of CAP reform (due in 2020).

The price outlook for New Zealand's commodity exports is therefore one where prices remain elevated for some time, driven by industrialisation and urbanisation in Asia.

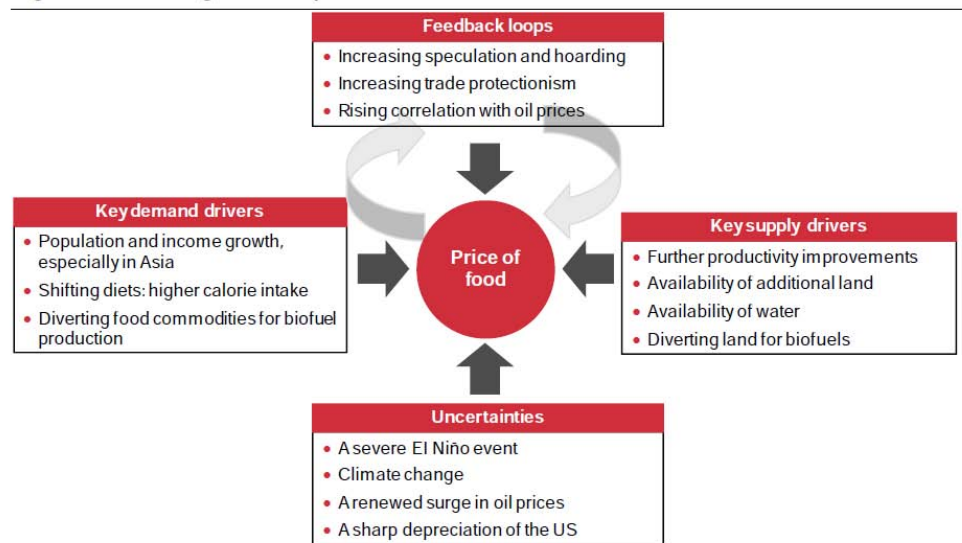
In the short term we are likely to see some falls in prices as weather events 'normalise' – i.e as grain production returns to normal. However, underlying demand conditions suggest it is likely that prices will only retrace somewhat to remain at favourable levels. Underlying price growth slightly in excess of inflation seems likely over the next 5-10 years as demand growth continues to outstrip any potential supply response in that time. Over a longer horizon, the ability of countries like India and China to increase productivity and production will undoubtedly lead to greater supply, reducing the likelihood of large real price increases continuing unabated.

Overall it seems likely that terms of trade will persist around current 'high' levels for the foreseeable future. However, this is only returning the terms of trade to the levels seen in the 1960s and 1970s. Indeed, rather than current levels being viewed as high, it is more likely that the terms of trade during the 1980s and 1990s were very low.

Other commentators tend to agree with this positive outlook. Nomura expect another multi-year food price rise, partly because of burgeoning demand from the world's rapidly developing and most populated economies, where diets are changing towards a higher calorie intake. The supply side of the food equation is being constrained by diminishing agricultural productivity

gains and competing use of available land due to rising trends of urbanization and industrialization, while supply has also become more uncertain due to greater use of biofuels, global warming and increasing water scarcity.

Figure 3. Drivers of global food prices



Source: Nomura Global Economics.

## Policy Response

For a central bank, the question of whether or not to respond to terms of trade shifts with monetary policy depends on whether it causes changes in the behavior of households and firms, or inflation expectations. Nevertheless, monetary policy should remain focused on the medium term objective of price stability.

We see current high commodity prices explained by two key factors. Underlying demand represents a structural shift, raising New Zealand's terms of trade to a permanently higher level. Similarly, supply constraints caused by the rise of biofuels and the reduction in production subsidies add to this permanent effect. At the same time, weather events have pushed prices above what can be explained by this structural shift, though are expected to be short-lived. In themselves, neither of these elicit a monetary policy response other than maintaining a flexible exchange rate regime, allowing the economy to adjust appropriately to the former, while looking through the inflationary effects of the latter.

The potential for prices rises to be persistent, but not permanent, exists but this is not our central view. For example, governments may decide the costs of subsidizing biofuels are too high and withdraw this support, flooding grain markets. At present we view this as very unlikely.

In maintaining a focus on medium term inflation policy makers will need to be cautious that terms of trade increases do not lead to increases in inflation expectations. Should households and firms decide that the income boost from higher commodity prices and exchange rates enables them to bring forward consumption and investment, or increase borrowing, it is possible an internal demand shock will arise. Consequent pressure on resources within New Zealand would lead to more inflationary pressure. Monetary policy would then act to contain any rise in inflation expectations.

Other central bankers with similar issues see exchange rate flexibility as the best mechanism for coping with a structural adjustment in the terms of trade. The Reserve Bank of Australia sees the high terms of trade that commodity prices have delivered as a long-run phenomenon, pointing to the expected longevity of China and India's growth. They view the events as a structural change in the economy, and that the structural change is overall healthy for the economy. Further they see the high exchange rate as delivering the benefits of the rising terms of trade to the community at large – through higher wealth and cheaper imports.

“There is going to be a non-trivial degree of structural change in the economy as a result of the large change in relative prices. This is already occurring, but if relative prices stay anywhere near their current configuration surely there will be a good deal more such change in the future. Because we can't confidently forecast where relative prices will settle, we cannot know how much such change is 'optimal'. Therefore we can't be sure that some of it will not need to be reversed at some point. But the optimal amount of change is unlikely to be none at all. So we should not look to prevent change; we should look to make it cost as little as possible. In general, that means preserving flexibility and supporting adaptation.” *Glenn Stevens, Governor, Reserve Bank of Australia, February 2011*

Recent Bank of Canada statements support the view that underlying demand has delivered a structural change in commodity prices. Further, the Bank of Canada warns

“From a policy perspective, it matters whether prices are being primarily driven by demand, supply or speculation. In general, supply shocks and speculative overshoots tend to be short lived and can be looked through. Demand shocks are different.

Policy-makers determined to take corrective action should proceed with caution. Without a clear diagnosis it is difficult to talk about remedies and policy fixes with any confidence.

Canada has learned through long experience that the role of the exchange rate is crucial. For commodity exporters, improvements in the terms of trade tend to put upward pressure on the exchange rate. When such movements in the nominal exchange rate are limited, wages and a range of other prices respond. This is a more disruptive form of adjustment that can have profound implications for employment, financial stability and competitiveness—the very objectives exchange rate management seeks to protect.” *Mark Carney, Governor, Bank of Canada, March 2011*

Overall, the consensus seems to be that monetary policy should maintain its focus on medium term targets. Current demand conditions suggest that some upward movement is structural and monetary policy can do little. However, there are also factors at play pushing prices higher than the structural change would suggest. Nevertheless, these are likely to be rather short-lived and outside the medium-term objective of monetary policy.

## Risks

Predictions about commodity markets are surrounded by uncertainty and historically have performed poorly. We have identified some potential risks to the outlook, presented below.

### Food price impact/Global supply response

The potential exists for high commodity prices to be the cure for high commodity prices. That is that as prices become too high, consumers in developing countries will demand less, pushing prices down. However, this is likely to be a short term reaction to temporary episodes of

excessively high prices caused by geopolitical tensions or weather events, such as experienced currently.

Also, high prices will encourage other suppliers to ramp up production. Despite limited available arable land, relatively low rates of productivity in the developing world mean there is scope for a significant supply response. Nevertheless, this would take some time.

Agricultural output in New Zealand over the last 30 years has increased despite a decline in farmed land. This increase has been driven predominantly by productivity gains and better allocation of suitable land resources (e.g conversions to dairy and forestry from marginal or unprofitable sheep and beef land). Most of the increases in productivity have come about through investing in simple improvements in agricultural techniques, including increased selective breeding, use of irrigation, fertilizers and commercially optimised seeds and better feeds.

However, agricultural productivity in the developing world is still well below that of New Zealand. Low quality of agricultural labour, small farm sizes and lack of knowledge of modern farm techniques have stalled productivity gains, while developed nations have continued to invest in and implement animal husbandry and updated farming methods. Hence, the potential exists for dramatic improvements in farm productivity in the developed world. Animals from better genetic stock and modern techniques could provide a significant boost to output. Urbanization also creates the potential for larger farms and intensification of agriculture, over time.

Mitigating the obvious upside supply risk somewhat, Fonterra comment that globally dairy farming does not have the ability to grow much faster than 2-3 percent each year over long term. This is despite very strong growth in dairy production in China witnessed prior to the melamine scare. Should world production grow at around 3 percent a year, this is still likely to fall short of demand over the next few years.

Other suppliers have capacity to increase production, notably India with improved farming methods, but also the likes of the Netherlands who are poised to increase production when the next round of EU CAP reforms come into effect.

Nevertheless supply growth is likely to be dampened by biological constraints, meaning it will take some time before supply acts as a significant dampener on prices.

### **Slower Chinese demand**

Given the importance of strong growth in China as a driver of the structural shift in demand, a significant drop in demand from China poses significant negative risks to commodity prices.

Over the longer term, demographic effects will eventually moderate demand, as China's lopsided population starts to age, and ultimately, shrink. However, urbanisation and development suggest strong growth to continue for quite some time. Even if growth slows to say 7 percent instead of 10 percent in China, the move to the cities will continue, and will still encourage greater demand for products that NZ produces.

Officials from the RBA regularly point to the sheer scale of urbanisation yet to occur in China as a cause for their unbridled optimism on commodities. Further, they point to India being in the very early stages of expansion into industrial commodities (and by extension higher nutrient foods) as good reason to expect higher prices to remain.

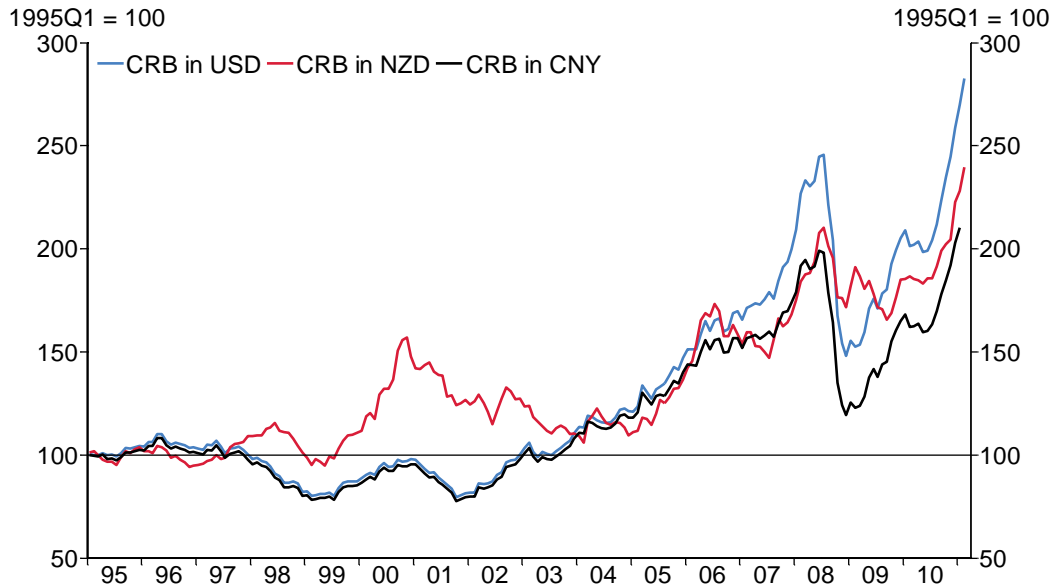
### **USD depreciation, CNY appreciation**

As most commodities are priced in USD, the depreciation of the USD leads to a direct valuation effect – either immediately raising prices (in USD terms at least) or reducing incomes in other currencies. If the latter occurs, the incentive for producers is to stockpile and reduce supply.

For purchasing countries, a weaker USD will lower the cost of imported food in local-currency terms, providing an incentive to increase demand. Continued weakness in the USD is therefore likely to lead to ongoing high prices.

Similarly, the ongoing appreciation of the CNY is likely to provide a constantly rising floor for commodity prices. While the CNY has been 'depegged' it is very much a one-way bet, that is, it will rise. To some extent this has already been happening. In CNY terms the CRB index is significantly lower than the overall index, and is even lower than the same index converted to NZD (figure 7).

**Figure 7: CRB in USD, NZD and CNY**



Even if the appreciation is limited to around 5 percent per year in the future, then prices can rise 5 percent per year and remain non-inflationary within China. As China provides the impetus for most demand growth at present (especially in hard commodities and dairy) it is conceivable that underlying commodity prices are appreciating at the same rate as the CNY. Should the Chinese authorities ever decide to let appreciation of the CNY do more of the work to control inflation within China, this may perversely have the effect of increasing global commodity prices (effectively allowing China to export its inflation).