

Real Grain Prices Climbing, Reversing a 60-Year Trend

Commodities Research

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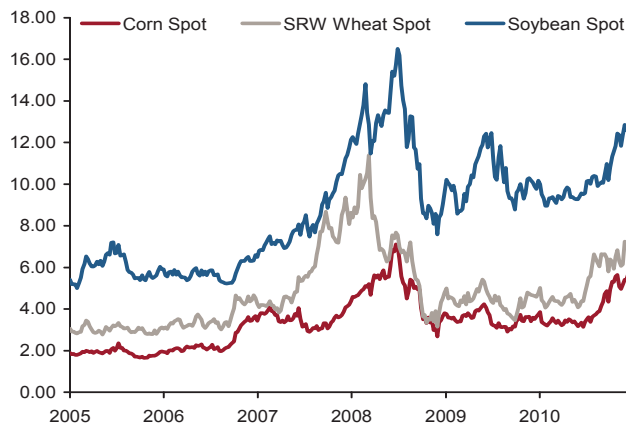
Global grain markets remain very tight, with corn and soybean inventories around multi year lows. Despite large increases over the past eight months, **we expect prices to continue to move higher** through to the middle of 2011. While our central scenario is for prices of corn and beans to peak at around the levels seen in 2008, **a further supply shock could see prices move dramatically higher**. Unfortunately, this looks possible, if not likely:

- Further **poor weather** remains a key risk, with several key crop regions remaining vulnerable.
- The risk of **further protectionist policies** from governments around the world also appears to be rising. Restrictions on international trade were significant factors underpinning the last stages of the price spikes in 2008.
- Recent rhetoric from many governments suggests that such actions, along with “panic buying” or hoarding, will be a key factor over 2011.

While the short-term dynamics are likely to capture most of the attention, it is possible that **we are at a significant moment in the history of the global grain market**. After trending lower over the second half of the 20th century, global grain prices appear to have stabilized over recent years. Given current very low inventories, and the apparent increase in demand growth (driven by ethanol and EM), a further significant supply shock could see real prices trend upward for a time, with the possibility that volatility could increase noticeably, after several decades of relative stability. Notably, **further price increases are likely to be driven by fundamentals, and government policies, with “speculators” playing a minor role at most.**

Exhibit 1: Wheat, Corn and Soybean price

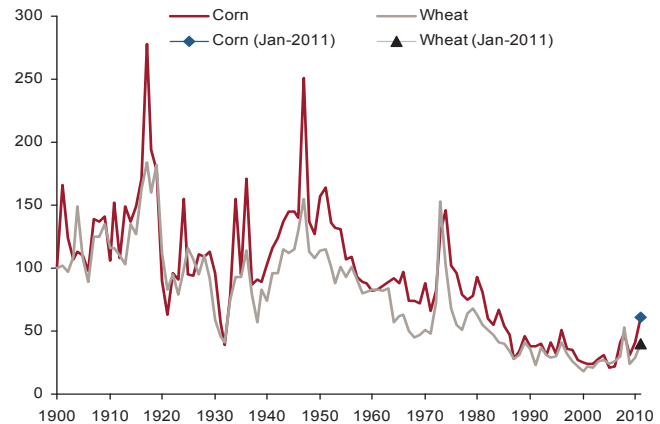
USD per bushel



Source: the BLOOMBERG PROFESSIONAL™ service

Exhibit 2: Real Corn and Wheat Prices

1900 = 100, deflated using US CPI



Source: Global Financial Data, the BLOOMBERG PROFESSIONAL™ service, Credit Suisse

Background

Prices of internationally traded grains have experienced several distinct phases over the past 110 years (Exhibit 2). In real terms, grain prices were highly volatile, but exhibited no clear trend between 1900 and 1950. However, between 1950 and 2000, prices generally trended lower, with the real price of corn in 2000 down around 85 per cent from that seen in 1950. More recently, real grain prices appear to have stabilized, with early signs that the downward trend may be coming to an end.

In terms of the near-term dynamics, spot prices for corn increased significantly (approximately 260 per cent in nominal terms) from the beginning of 2006 to the middle of 2008, but then fell heavily again as the “great recession” began to unfold over the second half of 2008. However, after troughing in 2009, prices have rebounded, with Credit Suisse forecasting a return to the 2008 highs for corn and soybeans by the middle of 2011, although at this stage the market for internationally traded wheat looks less tight.

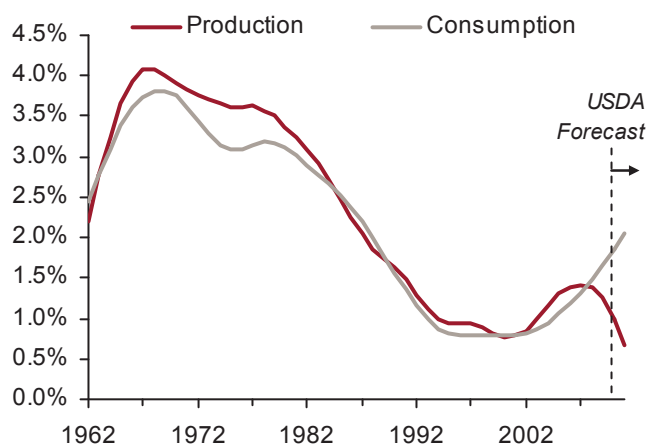
The expected move back to the prices seen in 2008 is likely to increase the already substantial attention on food prices, with attendant political and social problems already evident in several emerging market economies. Unfortunately there are several slow moving forces that suggest that any further short-term supply disruptions (be they weather or Government policy induced) could see prices move well above recent ranges – noting that the peak in 2008 was still 45 per cent in real terms below the price for corn seen as recently as the early 1970s.

Underlying Dynamics

In general, significant upward pressure on grain prices has historically been driven primarily by weather related crop failures, which caused a significant short-term reduction in supply. This can be seen clearly in Exhibits 3 and 4, which show that global production is far more volatile year to year than consumption, particularly for corn.

Exhibit 3: Wheat

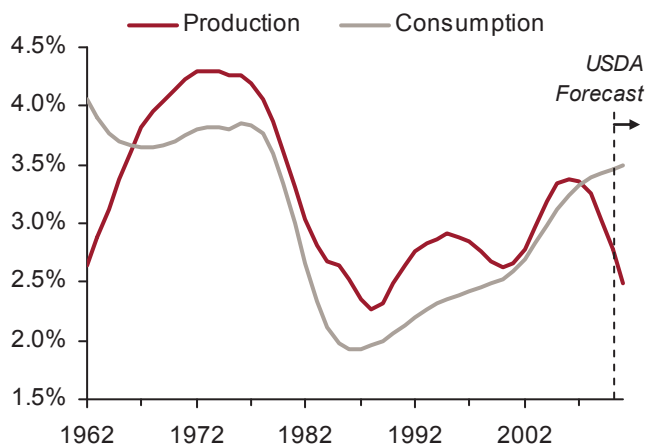
Global consumption and production growth, annual HP filter trend



Source: USDA, Credit Suisse

Exhibit 4: Corn

Global consumption and production growth, annual HP filter trend



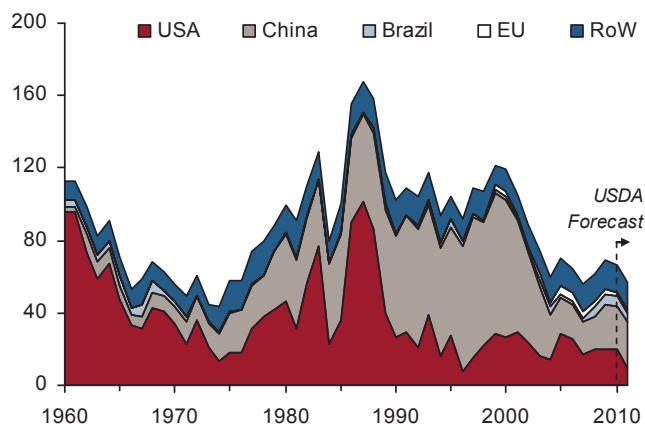
Source: USDA, Credit Suisse

More generally however, the “underlying tightness” of markets plays a key role in determining the impact of supply disturbances on prices. Interestingly, while global grain prices generally move relatively closely together, inventory levels and the gap between production and consumption of the markets often deviate significantly.

As Exhibits 5 and 6 show, after a period in the 1970s and 1980s when corn production generally grew faster than supply, since the early 1990s production and consumption have generally moved in tandem, with inventories in days of consumption falling steadily from the late 1980s peak. In general, the period of high inventories from the late 1970s to the early 2000s was accompanied by relative price stability, with year-to-year divergences in supply having a smaller impact on price given the large inventory cover.

Exhibit 5: Global Corn Ending Stocks

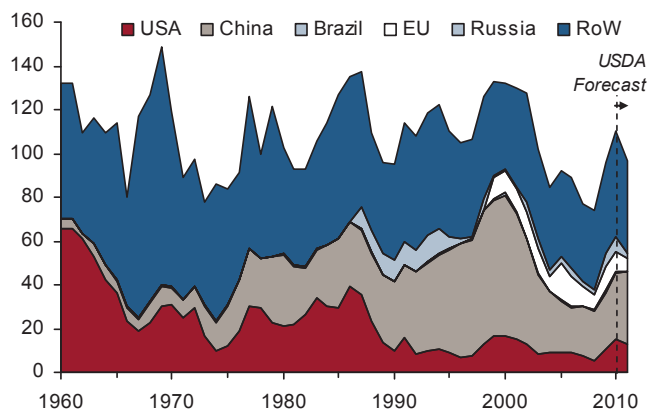
In days of consumption, annual data



Source: USDA, Credit Suisse

Exhibit 6: Global Wheat Ending Stocks

In days of consumption, annual data



Source: USDA, Credit Suisse

More recently, for both corn and wheat consumption, growth has increased noticeably, placing considerable pressure on supply to respond, with the significant crop failures seen in recent years resulting in a fall in the level of inventory cover. This is most noticeable for corn, where the United States Department of Agriculture (USDA) forecasts inventories in days of consumption to fall to levels not seen since the early 1970s in 2011. Wheat inventories are also expected to fall in 2011, although while in the lower part of the range seen over recent decades, the fall is not expected to be as dramatic as seen for corn, with the level in 2011 still likely to be above the critically low level seen in 2008. In contrast, soybean inventories remain relatively healthy, although US inventories are very low.

We believe further downward revisions are likely, and our base line forecasts expect inventories to fall modestly lower than the USDA estimates this year (even absent further shocks).

Increased Demand Growth – the Underlying Factors

A notable feature of both wheat and corn markets has been the significant increase in global demand growth over recent years. Growth in corn consumption slowed dramatically over the late 1970s and early 1980s, but has increased steadily ever since. Notably, since 2003, growth has increased further as the US ethanol program has kicked in. Global wheat consumption slowed significantly over the 80s and 90s, but began to pick up from 2005. Growth in global soybean consumption slowed over the 90s and the first half of the past decade. But there are now early signs that soybeans will also experience demand resurgence over coming years.

Nearly 40 per cent of the US corn crop will be used for ethanol production in 2011.

The first and perhaps most significant factor driving the increase in global consumption growth has been the emergence of US Government subsidies and mandates encouraging the use of grains in the production of ethanol.

The first round impact of this policy has primarily been on corn, where nearly 40 per cent of the US corn crop will be used for ethanol production in 2011. However, while the direct impact is mainly on the corn market, upward pressure on corn prices has seen a tendency for farmers to plant corn rather than soybeans (crops generally grown in similar regions and countries). With both soybean and wheat markets facing upward price pressure, it is likely that cropping acres available for wheat production will also come under pressure.

The second factor has been a significant step-up in demand from emerging market economies (particularly China). At first brush, the China impact appears to be mainly limited to the market for soybeans, where Chinese imports have grown substantially over the past decade to account for 57 per cent of the seaborne market in 2010. However, in essence, the Chinese have made a policy decision to remain self sufficient in corn and wheat, crops which have grown at the expense of soybeans, where imports have been allowed. While this policy has generally remained in place, it is notable that inventories of wheat and corn have also fallen to very low levels, with China importing significant quantities of corn in 2010 for the first time, raising the possibility that China will need to become a substantial net importer over coming years, particularly given the low level of Chinese inventory cover.

Government Policy

In addition to the above factors, governments have made a significant contribution to the current tightness in grains markets.

Firstly, they have generally reduced their involvement in grain markets, with government inventories falling to low levels over the past decade. This has contributed to the general inventory reduction, and the consequent increased sensitivity to supply disruptions.

Moreover, they have at times intervened in markets to blunt price signals and to distort trade flows (generally in the name of “domestic resource security”).

Given that we expect grain prices in particular to move higher, food commodities should be very much in the spotlight. Several governments, most notably China’s, have already begun to focus policies on trying to limit food price inflation – in part in an effort to ensure that it doesn’t spill over into broader based inflation – but also in an attempt to minimize the social consequences of higher food prices. Food prices have also been the catalyst for social unrest in several emerging market economies, with recent reports of governments purchasing large quantities of scarce grain resources to augment domestic supply.

Government policies risk exacerbating imbalances.

While the objectives are understandable, it should be noted that there is a risk that policies aimed at addressing food price inflation, such as price caps, trade restrictions, and “panic buying” will reduce the effectiveness of the price mechanism in the adjustment process. The risk is that in implementing policies that control prices in the short term, governments inadvertently reduce the incentives for higher production and lower consumption, thereby exacerbating the imbalances. For example, if major exporters were to impose further export restrictions, the reduction in supply to the global market could result in significantly higher food prices over coming years.

Relative performance

In recent times, corn has outperformed soybeans and wheat, bringing the ratio between the grains to recent lows. This has strong implications when looking forward to the next planting season as these prices play a part in the decision-making process. Based on 2009 USDA figures, soybeans were the most profitable crop after accounting for the costs associated with production when examined per acre. However, based on our 2011 price forecasts, corn will take the lead on profitability. Note that this excludes government payments and other secondary products that can be sold in association with production.

Exhibit 7: Grains Profit Comparison¹

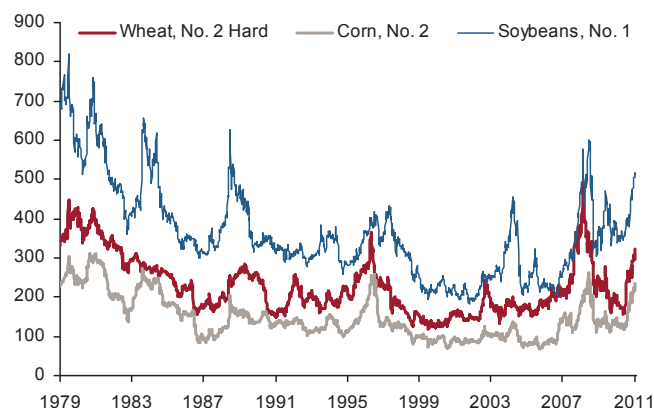
	CORN		SOYBEAN		WHEAT	
	2009	2011 est.	2009	2011 est.	2009	2011 est.
Price (USD/bushel)	3.59	6.50	9.30	14.50	5.42	8.44
Yield (bushels/acre)	156.00	152.00	47.20	43.40	40.40	46.40
Value (USD/acre)	560.04	988.00	438.96	629.30	218.97	391.62
Cost & Overhead per acre	546.63	601.29	359.74	395.71	288.83	317.71
Value net of costs per acre	13.41	386.71	79.22	233.59	-69.86	73.90

Source: USDA, Credit Suisse estimates

Still, despite the relative outperformance of corn amongst the grains and its growing profitability, it is important to note that all three have moved up considerably already. But, interestingly, when compared in real terms, we note that corn and soybeans are still slightly below their recent highs, while wheat continues to remain comfortably below.

Exhibit 8: Real Weekly Grains Prices

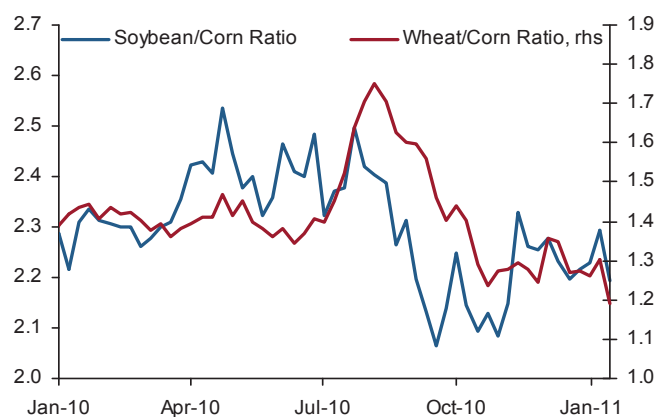
US cents per bushel, deflated with US GDP Deflator



Source: Thomson Reuters Datastream, Credit Suisse

Exhibit 9: Soybean/Corn and Wheat/Corn Ratios

Price ratio



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse

Summary of Forecasts

We expect corn and soybean prices to increase further over coming months, and to approach the highs seen in mid-2008 (up 8 and 17 per cent from current levels). While wheat prices are also likely to increase substantially, our base case scenario remains that wheat will peak below the levels seen three years ago.

While our central scenario is for prices for corn and beans to peak at around the levels seen in 2008, a further supply shock could see prices move dramatically higher. Unfortunately this looks possible, if not likely:

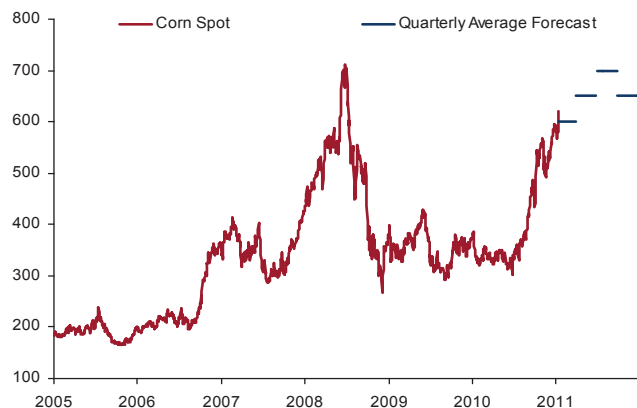
- Further poor weather remains a key risk, with several key crop regions remaining vulnerable.
- The risk of further protectionist policies from governments around the world also appears to be rising. Restrictions on international trade were a significant factor underpinning the last stages of the prices spike in 2008.
- Rhetoric from many governments suggests such actions, along with “panic buying” could be a key factor over 2011.

¹ 2009 values are from the USDA without accounting for secondary products. 2011 estimates are based on Credit Suisse annual average price forecasts, costs are inflated to reflect December 2010 PPI Intermediate Goods Index.

While the short-term dynamics are likely to capture most of the attention, it is possible that we are at a significant moment in the history of the global grain market. After trending lower over the second half of the 20th century, global grain prices appear to have stabilized over recent years. Given current very low inventories, and the apparent increase in demand growth (driven by ethanol and EM demand), a further significant supply shock could see real prices trend upward for a time, with the possibility that volatility could increase noticeably, after several decades of relative stability. Significantly, further price increases are likely to be driven by fundamentals, and government policies, with “speculators” playing a minor role at most. However, “speculators” are likely to be an obvious scapegoat.

Exhibit 10: Corn Spot History vs. forecast

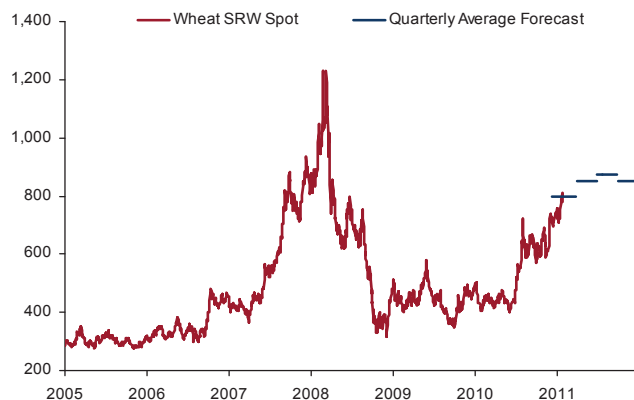
Cents per bushel



Source: the BLOOMBERG PROFESSIONAL™ service, USDA, Credit Suisse

Exhibit 11: Wheat Spot History vs. forecast

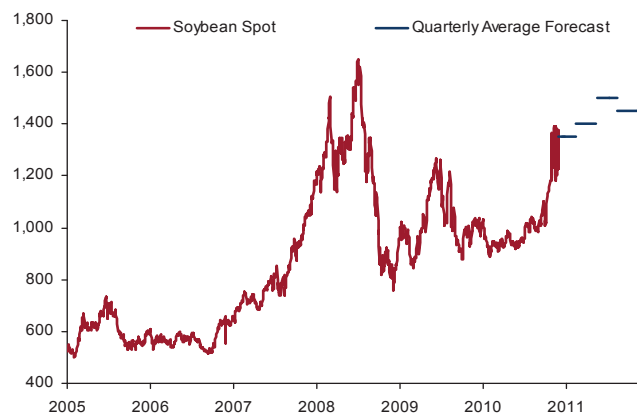
Cents per bushel



Source: the BLOOMBERG PROFESSIONAL™ service, USDA, Credit Suisse

Exhibit 12: Soybean Spot History vs. forecast

Cents per bushel



Source: the BLOOMBERG PROFESSIONAL™ service, USDA, Credit Suisse

Corn: Structurally Strong Demand Combines with Short-Term Supply Disruptions to Push Prices Higher

The past decade has seen a watershed in the global corn market, with the pace of consumption expansion effectively doubling to 3.9 per cent per year since 2003 (Exhibit 14). This, combined with a reduction in inventories held by governments, has left the market highly vulnerable to crop failures, as seen over the past year.

Absent further supply disruptions (normally driven by unseasonal weather), we expect prices to drift higher over the first half of 2011, before peaking at around the same levels seen in 2008. If, however, the main producing countries experience further weather related disruptions to crops, or governments intervene in markets to restrict trade, the current tightness suggests that prices could move dramatically higher, with the level well surpassing the 2008 high.

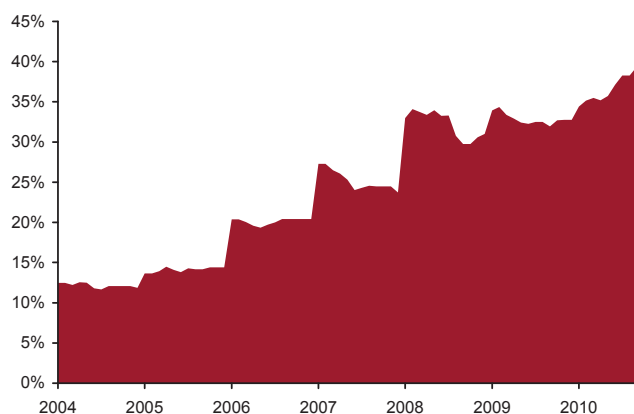
American Ethanol

The primary cause of this dramatic change in the pace of global consumption growth has been the US Government's ethanol policy, whereby gasoline in the US has been mandated to include a set percentage of ethanol. This, combined with the ethanol tax credit and import tariffs, has seen the proportion of the US corn crop (by far the biggest in the world, accounting for approximately 39 per cent of total global production, and 3.7 times the total global seaborne market in 2010) used for ethanol steadily increase, from merely 12 per cent in 2004 to 35 per cent in 2010 based on the USDA's figures.

While this steady increase looks likely to continue, at least in the short run, we expect the pace of growth in ethanol consumption to slow a little over coming years. The US EIA expects ethanol production to increase by 6% (50-k b/d) in 2011, as compared to nearly 8% just from the second half of 2010. The EIA further added that the 2011 increase is at these levels because it reflects the startup of ongoing projects and the restart of some plants that were idled during the recession. The EIA expects that this growth will slow to 1% in 2012 after most of these events are completed.

Exhibit 13: US Corn used in ethanol production

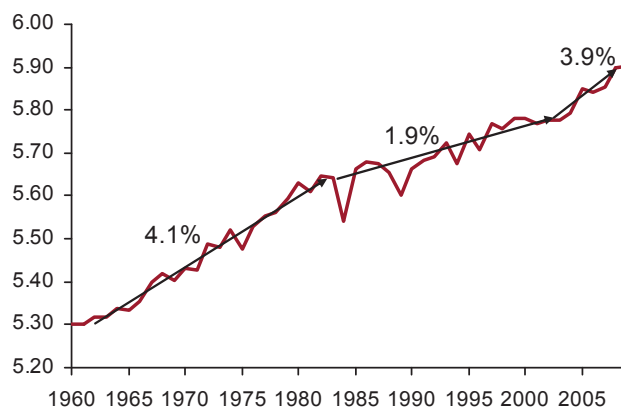
Percentage of US Production, annual estimates and revisions



Source: the BLOOMBERG PROFESSIONAL™ service, USDA

Exhibit 14: Global Corn consumption (Log Level)

Thousands of metric tons in logarithmic scale



Source: the BLOOMBERG PROFESSIONAL™ service, USDA

Corn in China

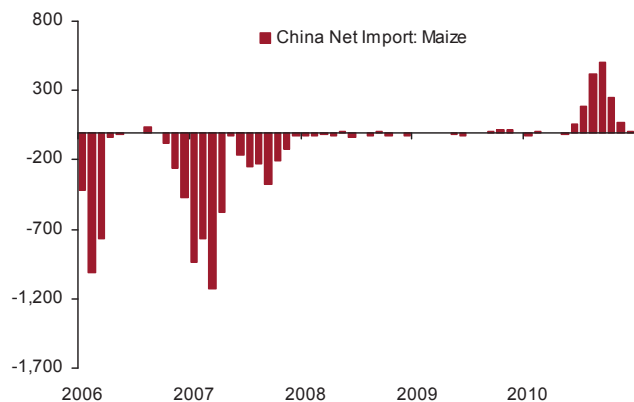
The second factor underpinning the increase in corn demand has been growth in Chinese consumption over recent years. The increase has been largely underpinned by the increasing demand for meat in diets, brought about by improvements in wealth and living standards. Based on USDA estimates, Chinese corn consumption increased by an average of about 4 per cent per year over the past five years to 159mt in 2010. Despite this, China has remained self sufficient with marginal interaction with the seaborne market.

During the 2009/10 crop cycle, Chinese corn production fell by around 8mt, despite increasing acreage planted, due to severe mid-summer droughts in the northeastern region during the prior year. This caused inventories to fall to historically low levels in terms of days of consumption, and saw China importing significant quantities of corn for the first time.

Although Chinese corn production is expected to rebound to 168mt next year, it should be noted that given the historically low level of inventory, any further supply disruptions will likely cause China to buy from the seaborne market once again. Although Chinese imports were relatively small (approximately 1.7 per cent of global trade based on Chinese Customs figures), given the tightness elsewhere, even a repeat of last year's imports could have a significant impact on the global price in 2011.

Exhibit 15: China Corn Net Imports

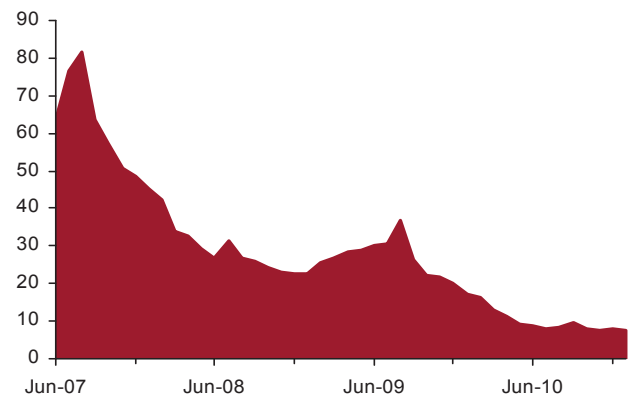
In thousands of tons, monthly data



Source: CEIC, China Customs, Credit Suisse

Exhibit 16: Chinese Forecast Ending Stock

In days of consumption



Source: the BLOOMBERG PROFESSIONAL™ service, JCIC, Credit Suisse

Corn - where is the new supply?

US Production

The current American supply situation remains tight in the short-run. USDA estimates for the 2010/2011 US crop harvest is at 316.2mt, down 4.9 per cent compared to the prior year's output after its latest revision. Forecast area planted is at 32.89 million hectares, a slight increase from prior year figures. World production is forecast to increase by less than half of one per cent to 816mt.

While the most recent forecasts included substantial downward revisions, discussions with industry suggest that they may still be a little too positive.

Exhibit 17: USDA Corn Production Figures

	Area (Million Hectares)		Yield (Metric tonnes/ hectare)		Production (Million metric tonnes)	
	2009/10 Est.	2010/11 Proj.	2009/10 Est.	2010/11 Proj.	2009/10 Est.	2010/11 Proj.
World	156.67	160.59	5.18	5.08	812.14	816.01
United States	32.17	32.96	10.34	9.59	332.55	316.17
Total Foreign	124.50	127.63	3.85	3.92	479.59	499.84

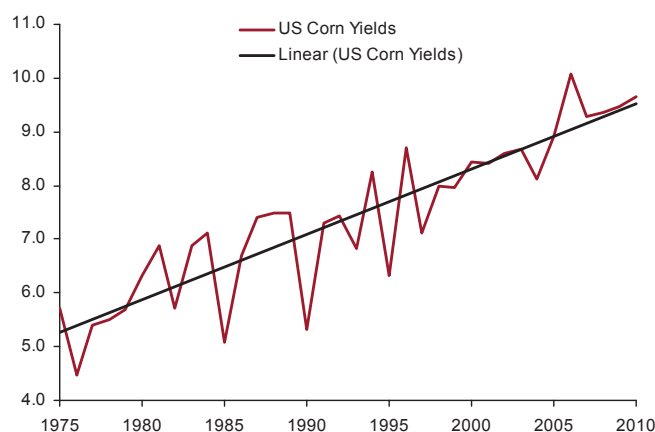
Source: USDA World Agricultural Production

Given the decrease in forecast production and increasing ethanol and export demand, it is likely that the US will continue to draw down on stocks.

It is interesting to note that before the ethanol mandates were introduced in the US, the market was in a comfortable equilibrium, with supply growing in line with demand. Supply growth was achieved primarily through steady productivity growth, with yields per acre increasing at a constant 2.8 per cent for at least the past 35 years. Essentially, technological progress was sufficient to meet the growth in global consumption until around 2003. Since then, however, as the pace of consumption growth stepped up, supply only kept up by stepping up the number of acres planted. While this has been achievable in the short term, it looks doubtful that this trend can continue, given increasing pressure on arable land.

Exhibit 18: US Corn yield

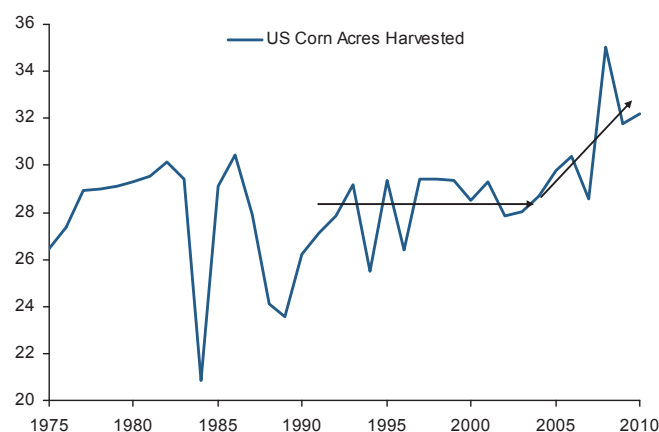
In metric tons per hectare, annual data



Source: the BLOOMBERG PROFESSIONAL™ service, USDA

Exhibit 19: US Corn area harvested

In millions of hectares, annual data



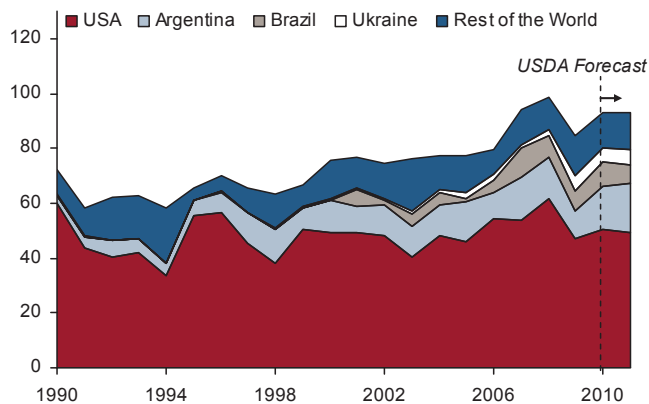
Source: the BLOOMBERG PROFESSIONAL™ service, USDA

Seaborne Trade

The US still remains the largest exporter of corn and the main supplier of the seaborne market. However, US exports have remained flat over the past 20 years - as a proportion of production, it has been decreasing since the eighties as the majority of new output has catered to the growing domestic needs. Thus, Brazil and Argentina took on the role of supporting the seaborne market. The combined export growth from these countries has contributed approximately 50 per cent of annual export growth making them the main source of new trade supply in the past two decades.

Exhibit 20: Top Corn Exporters

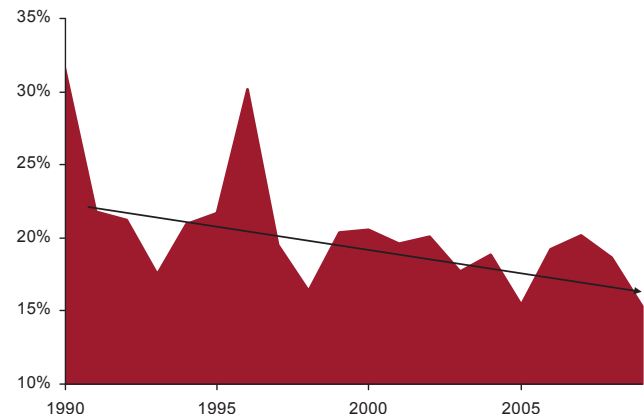
Millions of metric tons, annual data



Source: the BLOOMBERG PROFESSIONAL™ service, USDA

Exhibit 21: US Exports as Proportion of Production

Percentage



Source: the BLOOMBERG PROFESSIONAL™ service, USDA

However, it is also important to note that Argentina exports a large proportion of its domestic output - nearly 70 per cent of its production in 2010. This implies that disruptions to the harvest there would likely directly translate to reduced exports. Brazil also exported a meaningful 16 per cent of its corn production last year.

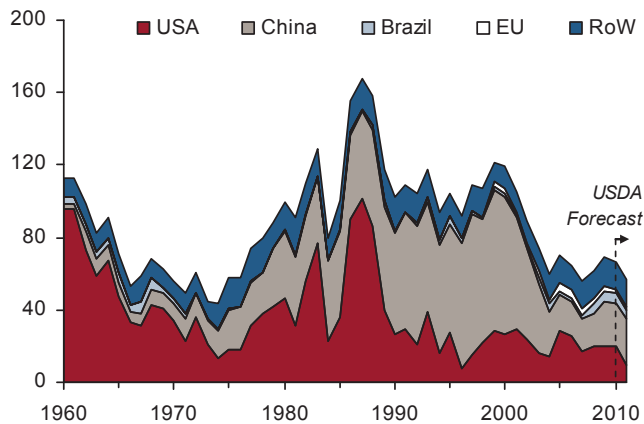
This is especially important now given that food inflation has come back on top of government concerns: Brazil's December 2010 food CPI (ytd) was reported at 10.4 per cent while Argentina's December Food and Beverages CPI (yoy%) was reported at 16.5 per cent. Given these numbers, the risk of export restrictions being imposed on grains has increased significantly.

Bullish View

The increase in global consumption growth has put significant pressure on global supply. While in the good years, supply has been able to keep up (at least so far), the corn market has become more vulnerable to crop failures and other disruptions. With US WASDE carryout estimates falling to near historically low levels, and forecasts for crop yields in the US continuing to fall, we expect tensions in the corn market to increase further over the coming year. While the current high level of prices suggests that the increase in 2011 will be more modest than in 2010, the tight market suggests that prices remain sensitive to further supply disruptions.

Exhibit 22: Global Corn Ending Stocks

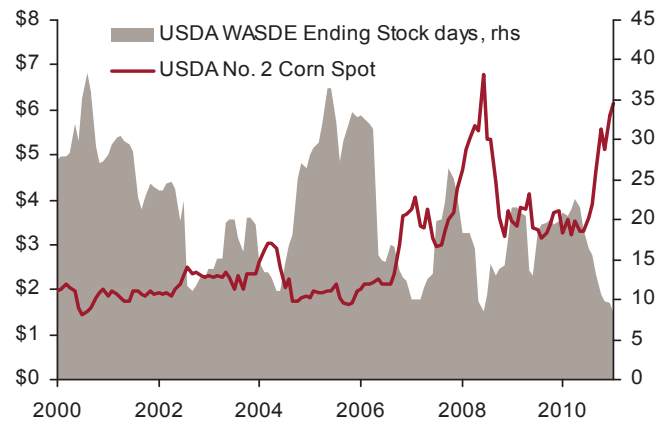
In days of consumption, annual data



Source: the BLOOMBERG PROFESSIONAL™ service, USDA

Exhibit 23: Corn prices and inventory days

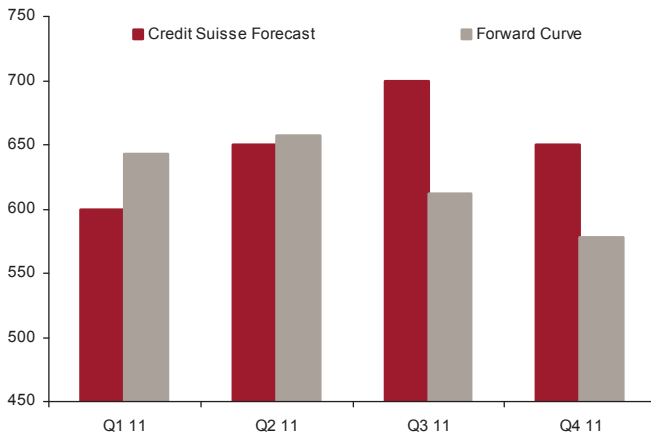
USD per bushel and days of global consumption



Source: the BLOOMBERG PROFESSIONAL™ service, USDA

Exhibit 24: Corn Forecast vs Forward Curve

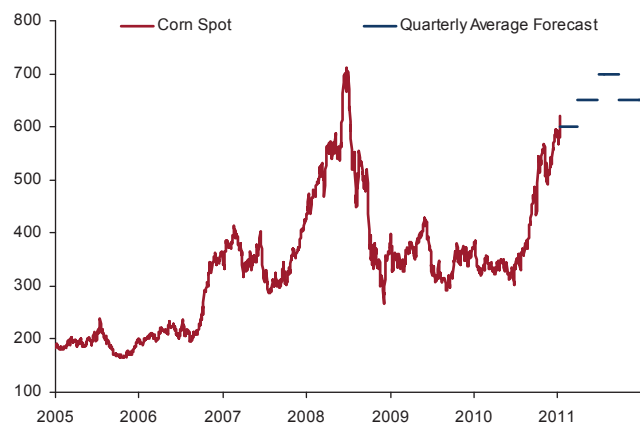
Cents per bushel



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse

Exhibit 25: Corn Spot History vs. forecast

Cents per bushel



Source: the BLOOMBERG PROFESSIONAL™ service, USDA, Credit Suisse

Exhibit 26: Corn Forecast

US cents/ bushel

2010 Yr Ave	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2011 Yr Ave	2012 Yr Ave
458.69	600	650	700	650	650	600

Source: Credit Suisse Global Commodities Research

Wheat: Less tight (for now)....

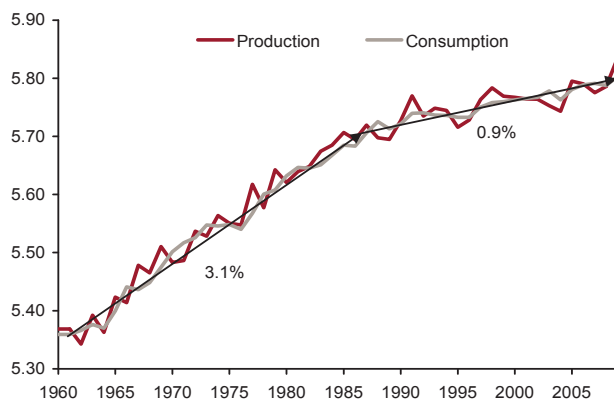
Wheat Ethanol?

Wheat can be processed into ethanol much like corn and yields nearly the same amount of ethanol per unit of grain (about 2.5 – 2.7 gallons per bushel). Although propriety technologies both claim improvements in yields using both crops, large scale development of wheat ethanol has always been hindered by cost factors since wheat prices have remained higher than corn. However, recent price movements have pushed the prices of both grains closer once again (see price ratios in Exhibit 9), and it is making more economic sense to process ethanol from wheat. Still, corn will need to move higher by another 10 to 15 per cent and remain there for some time before this will take off.

The bulk of current wheat demand however remains in food (flour/pasta) production and for use in animal feeds. Demand in this area is expected to continue driving wheat consumption growth at recent elevated rates, as both hard wheat (used in bread making) and soft wheat (used for cakes, cookies and snacks) continue to remain an important dietary requirement in the world, whilst milling waste and/or poor quality wheat continues to be a good source of animal feed.

Exhibit 27: Global wheat production / consumption (Log Level)

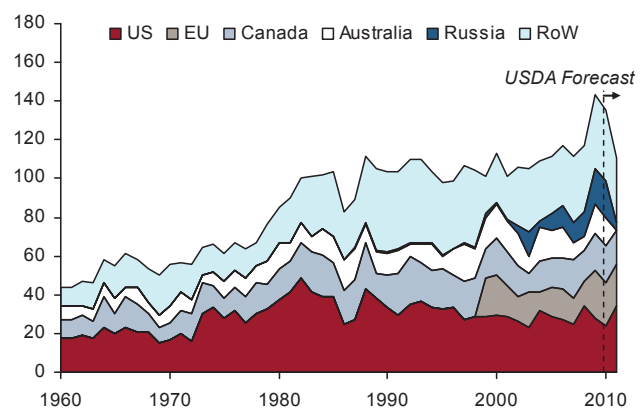
Thousands of metric tons in logarithmic scale



Source: the BLOOMBERG PROFESSIONAL™ service, USDA

Exhibit 28: Top Wheat Exporters²

Millions of metric tons, annual data



Source: the BLOOMBERG PROFESSIONAL™ service, USDA

Concerns on Falling Production

The global wheat trade is the largest amongst the grains, with exports of around 135mt in 2010 according to USDA estimates. However, there is growing concern over next year's supply - Russia's exports will likely be negligible because the production loss due to last year's drought is forecast to be greater than the country's total exports in 2010.

The USDA estimates world wheat output to fall 5.4 per cent, down nearly 37mt to 645mt in 2010/11, mainly due to a poor Russian planting season, which is expected to lead to a 20.2mt decrease in next year's output (almost a 32 per cent reduction). Furthermore, projected US output decreased slightly to 60.1mt in 2010/11, a slight fall compared to 2010 estimates.

Projected land allocated to the wheat crop will also decrease by more than 4 million hectares in 2010/11. Half of this lost acreage, about 2 million hectares, is already due to Russia's drought that decreased the amount of wheat planted. However, the remainder of the loss seems to be the result of the battle for acreage between the grains.

² EU data only start from 1999, but the sum of exports from member nations pre-1999 would have constituted the second largest exporter after the US.

Exhibit 29: USDA Wheat Production Figures

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