

Why are current world food prices so high?

A memo

Martin Banse
Peter Nowicki
Hans van Meijl

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Het LEI had the following research areas:

-  International policy
-  Development issues
-  Consumers and supply chains
-  Sectors and enterprises
-  Environment, nature and landscape
-  Rural economy and use of space

This report over the research area International policy.

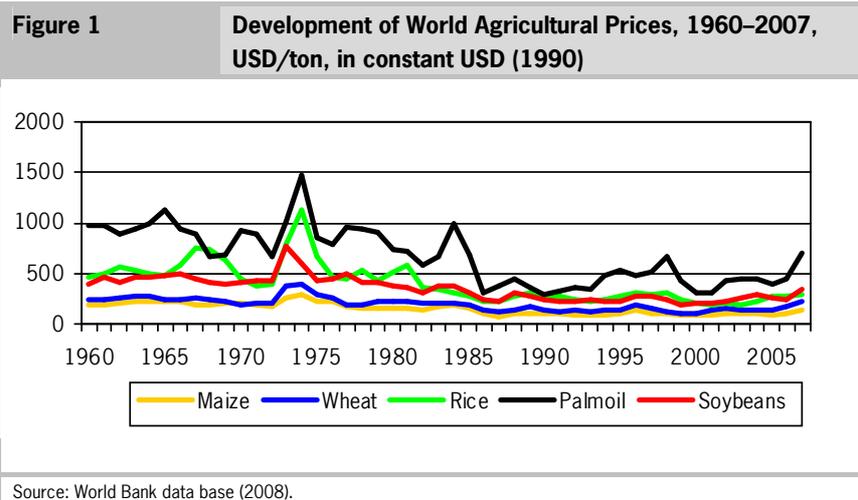
This document is financed by the Dutch Ministry of Agriculture, Nature and Food Quality. It is based on secondary literature, own research and consultations with experts in the field of world agriculture market analysis. We consulted the following experts: Patt Westhoff (FAPRI), Josef Schmidhuber (FAO), Loek Boonekamp (OECD), Ron Trostle (ERS/USDA), Pavel Vavra (OECD), Willie Meyers (FAPRI) and Pierre Charlebois (Agriculture and Agri-Food Canada). Furthermore, we benefited greatly from insights and the discussions during the World Agricultural Outlook Conference, organized by ERS/USDA Washington DC, May, 14-15, 2008 and the Modeling Workshop on Biofuel, May, 16 organized by Farm Foundation and ERS/USDA Washington DC.

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1 World agricultural prices in a historical perspective

World agricultural prices are very volatile which is due to traditional characteristics of agricultural markets such as inelastic (short run) supply and demand curves (see, Meijl et al. 2003).¹ The volatility is also high because the world market is a relatively small residual market in a world distorted by agricultural policies.² The combination of high technological change and inelastic demand cause real world prices to decline in the long run (trend). The prices, however, of many (major) agricultural commodities have risen quickly over recent years (see Figure 1).



Recent increase in agricultural prices are strong, but even with the increase that we have observed in the last three years, real agricultural prices are still low compared to the peaks in prices of the mid-70s. Local prices are linked with

¹ "World food prices are instable and will remain unstable in the future. Forecast errors are large in predictions of world prices. There are always unexpected events in important drivers such as yields which are dependent on weather, plagues and diseases". See, Meijl, H. van et al. (2003) *Prijzen op agrarische wereldmarkten; Een verkenning van projecties*. LEI, Rapport 8.03.06.

² Trade share (2006) in global production: rice (7%), cheese (7%), coarse grains (11%) and wheat (20%), FAO Statistics.

these world prices. The transmission effect depends on the transparency of markets, market power and accessibility.

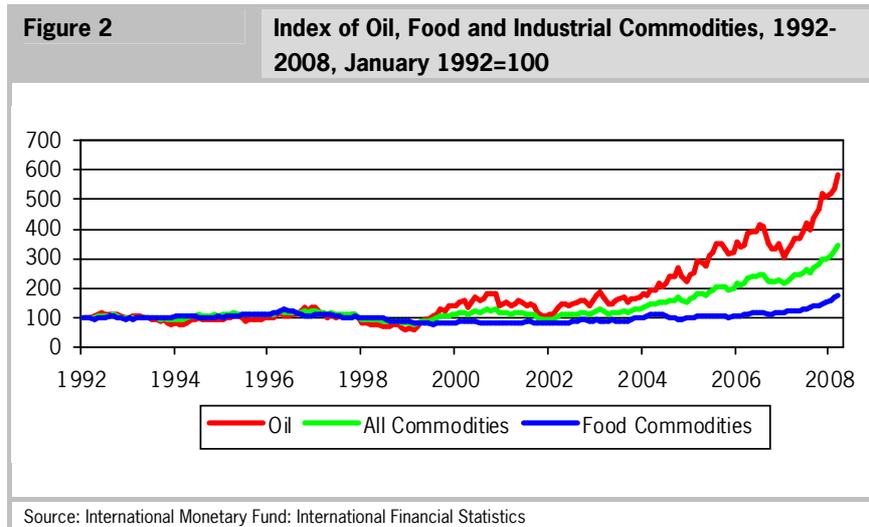
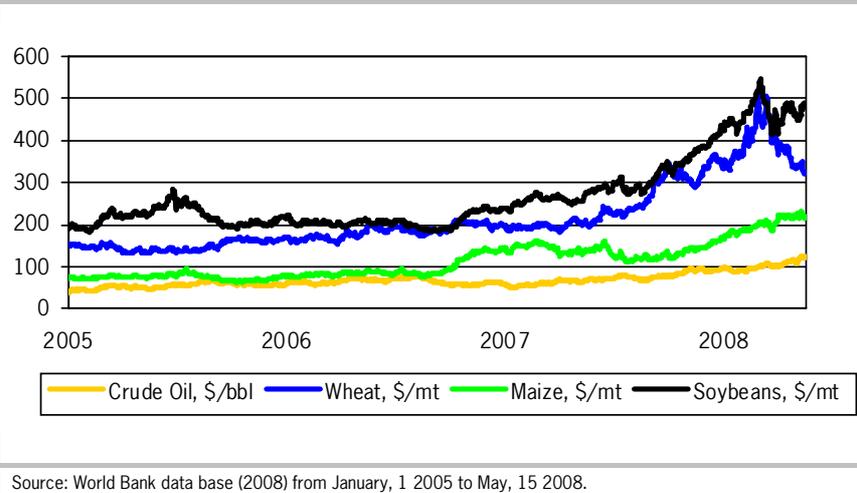


Figure 2 depicts the price index for food commodities along with an index for the average of all commodities and an index for crude oil. Although the food commodity index has risen more than 60 percent in the last 2 years, the index for all commodities has also risen 60 percent and the index for crude oil has risen even more (see, also Trostle 2008)¹. Since 1999 food commodity prices have risen 98 percent (as of March 2008); the index for all commodities has risen 286 percent; and the index for crude oil has risen 547 percent. In this perspective, the recent rise in food commodity prices is moderate. Figure 3 shows that spot prices in early 2008 for soybean and wheat are declining again while the spot prices for rice and crude oil continue to rise. The prices of wheat and soybeans declined by almost 30% and almost 20%, respectively, since their peak at the end of February this year.

¹ Ronald Trostle (2008) Global Agricultural Supply and Demand: Factors Contributing to the Recent Increase in Food Commodity Prices. ERS/USDA. WRS-0801 May 2008.

Figure 3 Daily Price Notations for Crude Oil, Wheat, Maize and Soybeans; Spot prices, 2005-2008, at current USD



However, although real food prices are not extremely high in a historical perspective and other commodities have risen more, an increase in the price of food – a basic necessity – causes hardships for many lower income consumers around the world. This makes food-price inflation socially and politically sensitive. This is why much of the world’s attention is now focused on the increase in food prices more than on the more rapid increase in prices of other commodities, (see, Trostle 2008, p. 4).

The question on the minds of many consumers around the world is, “Will food prices drop again this time?” Or, stated another way, “Is the current price spike any different from those of the past, and if so, why?”

2 Long run effects

Long run drivers of demand (based on Scenar 2020, Nowicki et al., 2006)¹

Population and macro-economic growth are important drivers of demand for agricultural products. In past years, rapid population growth has accounted for the bulk of the increase in food demand for agricultural products, with a smaller effect from income changes and other factors (Nowicki et al., 2006)². The world's population growth will fall to about 1% in the coming ten years. Continued economic growth is expected over the coming period in almost all regions of the world (see Figure 4).

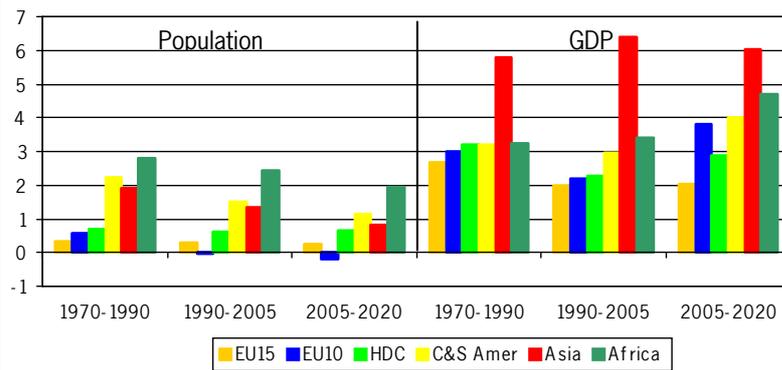
Expected population developments in period 2005-2020

- The world's population growth will fall from 1.4% in the 1990-2003 period to about 1% in the coming ten years. This is mainly due to birth or fertility rates, which are declining and are expected to continue to do so.
- Almost all annual population growth will occur in low and middle income countries, whose population growth rates are much higher than those in high income countries.
- Europe's share in world population has declined sharply and is projected to continue declining during the 21st century.
- Population growth in Europe is very low (0.3% yearly for EU-15) or slightly negative (-0.2% for EU-10).
- The uncertainty with regard to birth and death rates at world or regional level is not too large. However, migration flows between countries and regions are much more uncertain.

¹ Nowicki, P., H. van Meijl, A. Knierim, M. Banse, J. Helming, O. Margraf, B. Matzdorf, R. Mnatsakanian, M. Reutter, I. Terluin, K. Overmars, D. Verhoog, C. Weeger, H. Westhoek (2006). Scenar 2020 - Scenario study on agriculture and the rural world. Contract No. 30 - CE - 0040087/00-08. European Commission, Directorate-General Agriculture and Rural Development, Brussels.

² Projections for population and GDP for the EU member states are taken from a study of the Economic Policy Committee of the European Commission called "The 2005 EPC projection of age-related expenditure: agreed underlying assumptions and projections methodologies, 2005". The projections for the rest of the world are based on assumptions used in the OECD and USDA agricultural Outlooks.

Figure 4 World population and GDP growth (annual growth %)



Source: USDA for 1970-1990 and 1990-2005. Projections for 2005-2020 derived from Scenar 2020, Nowicki et al. (2006).

Global Income growth

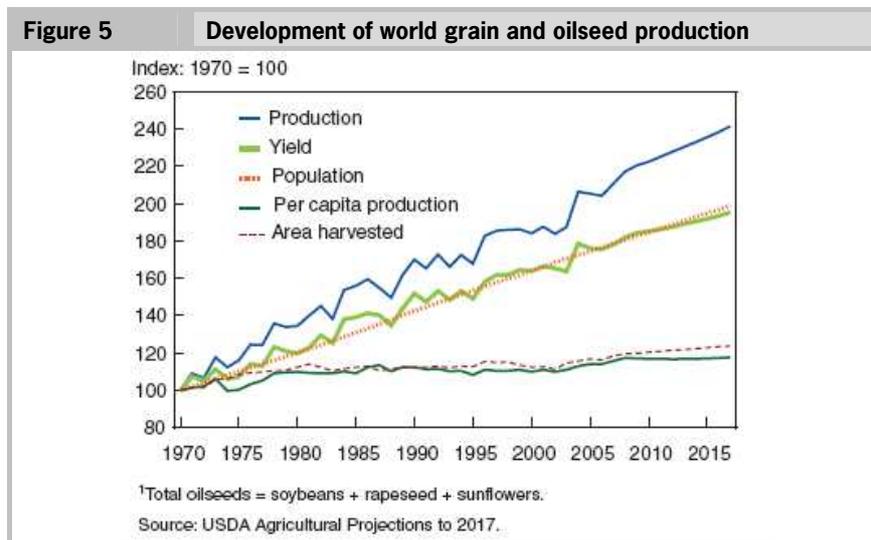
- Robust economic growth is expected over the coming period in almost all regions of the world in the baseline scenario (see Figure 4).
- Economic growth will be considerably higher for most of the transitional and developing countries than for the EU-15, the United States and Japan, in particular for Brazil, China, India and the new EU member states. Incomes in Europe are expected to increase slightly over the coming years.
- Annual income growth in Europe is about 2% for EU-15 and 3.8% for EU-10.
- World and EU economic growth in the future stays uncertain and depends on the amount of investments in education and research, on technological opportunities, on the degree of participation in the political, societal and market arenas, and on the liberalisation of world commodity and factor markets.

The robust growth of income per capita leads to more “luxury” consumption in developed countries. This implies more convenience food, processed products (ready to eat) and food safety, environmental and health concerns. In developed countries the total amount of food consumed will only grow in a limited manner. However, in developing countries a higher income induces more production and a shift to more value-added products. Important is the switch

from cereals to meat consumption, as an increased demand for meat induces a relatively higher demand for grain and protein feed. To produce 1 kg of chicken, pork and beef, respectively 2.5 kg, 6.5 kg and 7 kg of feed are required.¹

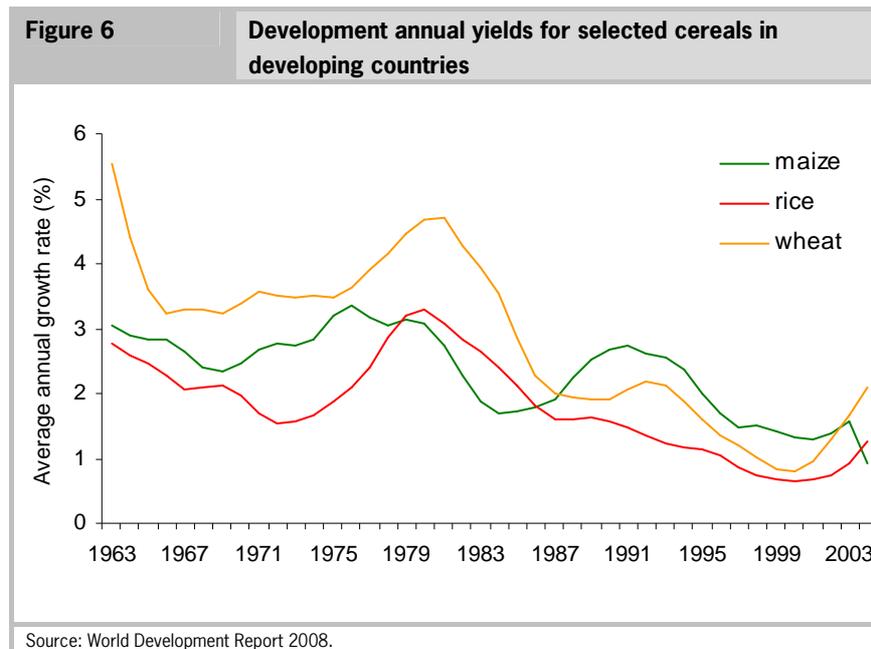
Long-term drivers of supply

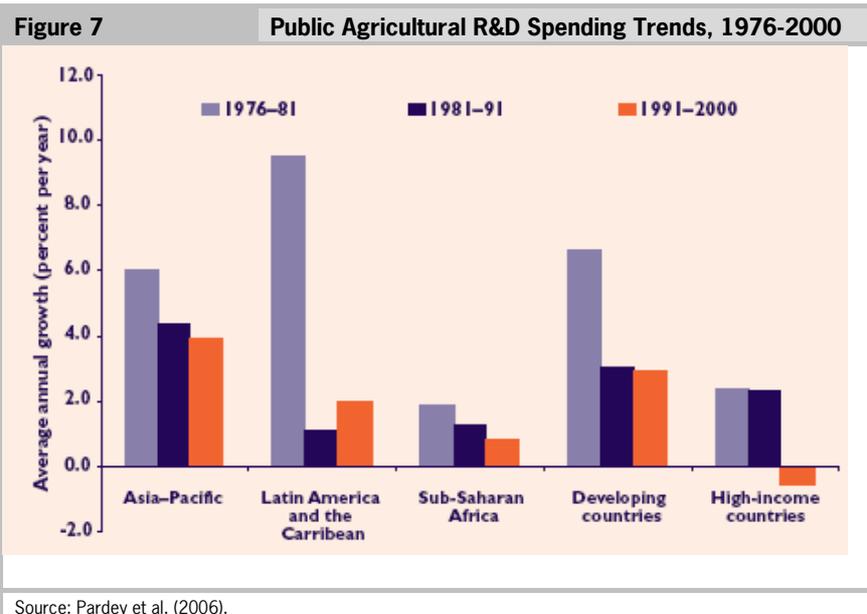
With regard to crop production, yield and area developments are important drivers of supply. Figure 5 shows that production growth was almost totally determined by yield increase while the total area harvested was more or less constant. The growth in yields declined from 2% per year in the 1970-1990 period to 1.1% in the 1990-2007 period. USDA expects the growth to decline to 0.8% per year for the period 2009-2017 (USDA, 2008). At the global scale, crop production area increased in the 1970-2007 period by 0.15% per year, and USDA expects the area to grow by 0.4% per year in the period 2007-2017.



¹ The numbers describe upper-bound estimates of conversion rates: 7 kg of corn to produce 1 kg of beef, 6.5 kg of corn to produce 1 kg of pork, and 2.6 kg of corn to produce 1 kg of chicken. Source: Ephraim Leibtag, "Corn Prices Near Record High, But What About Food Costs?" In *Amber Waves*, February 2008. Modern technology, however, require much less feed especially in pork production; here average feed conversion rates are between 3.2-2.6 kg of feed per kg of meat.

Figure 6 shows that growth rates of yields for major cereals in developing countries are slowing. It should be mentioned that the decline in annual growth rates is not necessarily related to a decline in absolute yield growth per annum. An important explanation for the decreasing yield growth rates might be the declining public agricultural research and development spending over time in both developing and developed countries (see Figure 7). Although private sector research has grown, private sector R&D is mostly cost reducing\short run oriented instead of public R&D, which is often more yield enhancing\long term oriented.





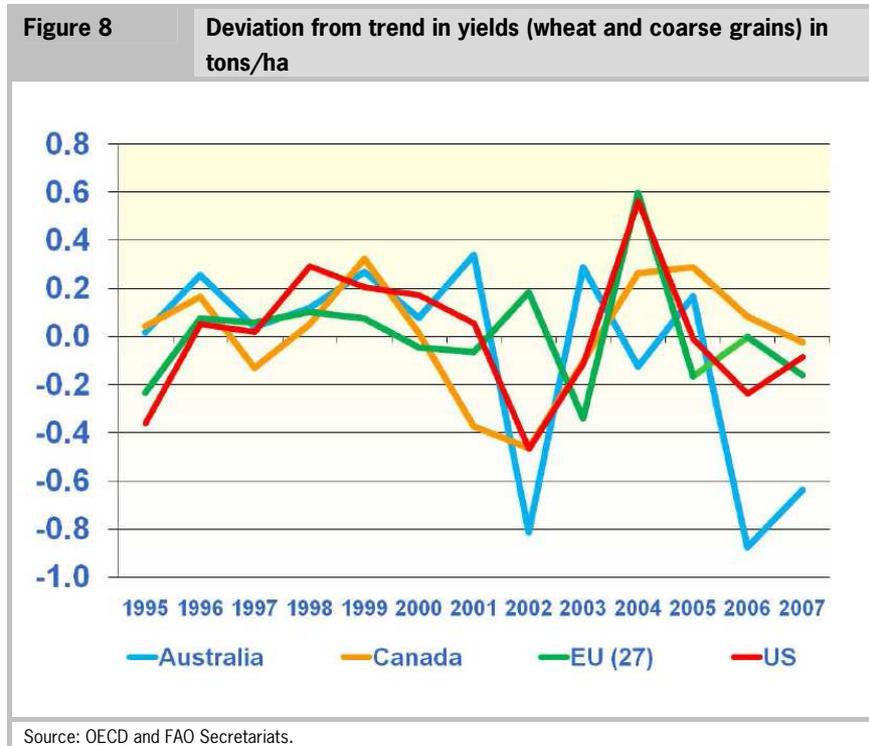
- The direct link between R&D spending and yield growth had been intensively discussed amongst agricultural scientists and is not fully clear.
- The general outcome of this discussion is that an additional growth in yield rates requires more than additional spending in capital stock but also investment in human capital stock and improvements in market institutions

3 What explains the recent increase in agricultural prices?

A combination of record low global inventory levels, weather induced supply side shocks, surging outside investor influence, record oil prices and structural changes in demand for grains and oilseeds due to biofuels have created the high prices. The question is whether it is a coincidence that the past and current high price levels coincide with high oil prices or whether other reasons for the current price peak are more important.

Effects on the supply side

- Poor harvests in Australia, Ukraine and Europe for wheat and barley. According to FAO statistics, these three regions contributed on average 51% of total world barley production and 27% of total world wheat production for the period 2005-2006.



- Lower harvests in wheat and barley are more than compensated by a bumper harvest for corn worldwide.
 - Therefore, world cereal production increased in total even in 2007.
 - The bumper harvest in corn kept corn prices low and the wheat-corn spread increased significantly (see Figure 3).
 - Only recently have corn prices also strongly increased.

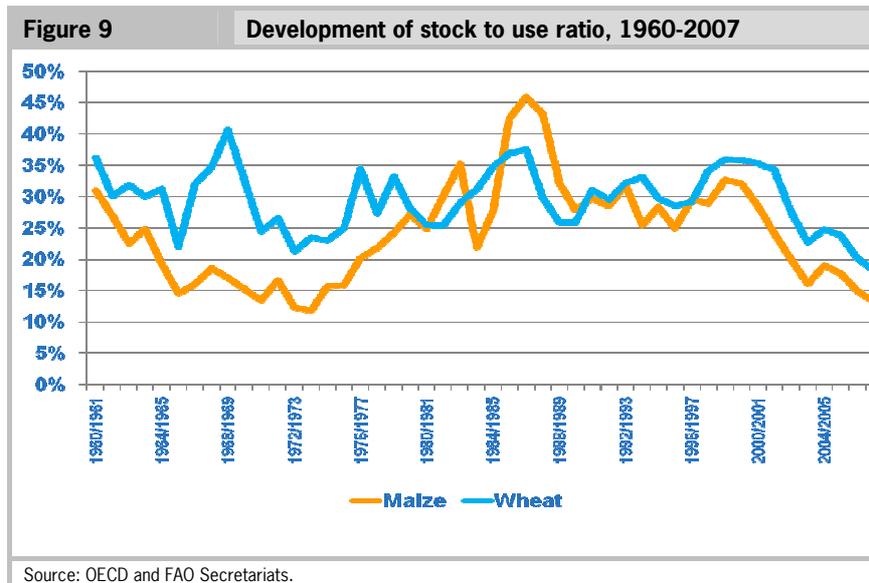
- Higher energy prices lead to higher food prices as costs (e.g. fertilizer, processing, and transport) increase. Higher transport costs induce higher price effects as distances increase.
- CAP policies such as mandatory set-aside regulation or production quota restrained supply. Furthermore, there was a change from price to income support and compensatory payments became decoupled, set aside was introduced and export subsidies were diminished. Some of these measures limited supply within the EU. However, the general aim of the last CAP reforms was an enforcement of farmers' ability to react to market signals instead of following policy signals given by market price support. Measures aimed to restrict supply, e.g. production quota or set-aside requirements, are instruments designed for a world with declining prices, but which may act to reinforce prices in case of food shortages.
- Low prices in the last decades did not provide an incentive to invest in productivity enhancing technologies.

Effects on the demand side

- Constant demand in Europe and Northern America with an increase in demand in Asian countries
- Change in diet in emerging economies.
- Additional demand for biofuels:
 - 5% of global oilseed production is processed to biodiesel or is used directly for transportation.
 - 4.5% of global cereal production is used for ethanol production.
 - Therefore, this *marginal* extra demand triggered the markets.
 - However, biofuels are not new. Ethanol based on sugar cane exists in an economically profitable way in Brazil for a long time.
 - Increasing food and feedstock prices make biofuels less profitable and food more profitable. This shifts production back to food (in US is this already visible; Trostle 2008, p.17). With current high prices for soybeans in the US margins for biodiesel became already negative and the biodiesel production slowed down [see presentation of Gerald A. Bange (USDA) on the Agricultural Markets Roundtable held April 22, 2008 Washington, DC at the Commodity Futures Trading Commission].

Development of Stocks

- The trend of a declining stock to use ratio as described in Figure 9 has increased and stocks for wheat are currently running on empty.
 - This implies that all the shocks mentioned above could not be mitigated by using stocks but lead immediately to price increases. Furthermore, it enabled speculation (with stocks available there would have been less room for speculation)



Policy Responses to Rising Food Prices

- The rapidly increasing world prices for food grains, feed grains, oilseeds, and vegetable oils are causing domestic food prices at the consumer level to rise in many countries. In response to rising food prices, some countries are beginning to take protective policy measures designed to reduce the impact of rising world food commodity prices on their own consumers. However, such measures typically force greater adjustments and higher prices onto global markets.
- In the fall of 2007, some exporting countries made policy changes designed to discourage exports so as to keep domestic production within the country.

The objective was to increase domestic food supplies and restrain increases in food prices. The box below depicts a partial list of these policy changes.

Eliminated export subsidies:

- China eliminated rebates on value-added taxes on exported grains and grain products. The rebate was effectively an export subsidy that was eliminated.

Export taxes:

- China, with food prices still rising after eliminating the value-added tax rebate, imposed an export tax on a similar list of grains and products.
- Argentina raised export taxes on wheat, corn, soybeans, soybean meal, and soybean oil.
- Russia and Kazakhstan raised export taxes on wheat.
- Malaysia imposed export taxes on palm oil.

Export quantitative restrictions:

- Argentina restricted the volume of wheat that could be exported even before raising export taxes on grains.
- Ukraine established quantitative restrictions on wheat exports.
- India and Vietnam put quantitative restrictions on rice exports.

Export bans:

- Ukraine, Serbia, and India banned wheat exports.
- Egypt, Cambodia, Vietnam, and Indonesia banned rice exports. India, the world's third largest rice exporter, banned exports of rice other than basmati, significantly reducing global exportable supplies.
- Kazakhstan banned exports of oilseeds and vegetable oils. Early in 2008, importing countries also began to take protective policy measures to combat rising food prices. Their objective was to make high-cost imports available to consumers at lower prices. A partial list of policy changes follows.

The following countries reduced import tariffs:

- India (wheat flour)
- Indonesia (soybeans and wheat; streamlined the process for importing wheat flour)
- Serbia (wheat)
- Thailand (pork)
- EU (grains)
- Korea and Mongolia (various food commodities)

Subsidizing consumers:

- Some countries, including Morocco and Venezuela, buy food commodities at high world prices and subsidize their distribution to consumers.

Other decisions by importers:

- Iran imported corn from the United States, something that has occurred rarely—only when they could not procure corn elsewhere at reasonable prices.

The policies adopted by importing countries also changed price relationships in world markets. Their policy changes increased the global demand for food commodities even when world prices were already rapidly escalating.

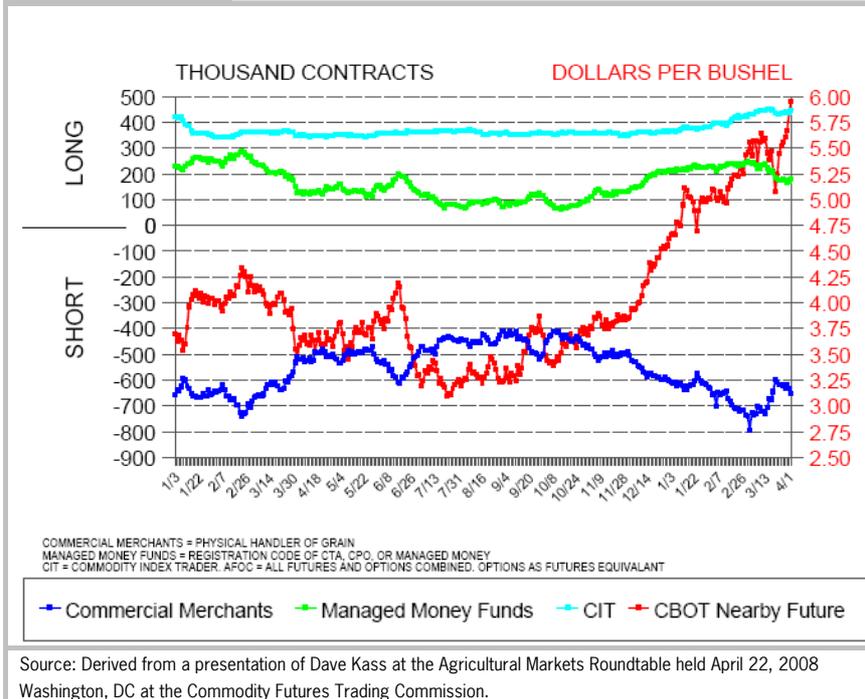
Source: Ronald Trostle (2008) Global Agricultural Supply and Demand: Factors Contributing to the Recent Increase in Food Commodity Prices. ERS/USDA. WRS-0801 May 2008.

Other effects

- USD exchange rate developments. World prices are denominated in dollars and the dollar depreciated against most currencies. The increase in prices in other currencies is therefore much less.
- SPECULATION:
- In recent months spot and future prices do not fully converge.
- Future prices remain higher than prices on spot markets.
 - Reason for this development:
 - Most hedging (90%) is Index-hedging, i.e. 'traditional' short- and long hedging does not dominate the price development in the future markets.
 - Thus, if everybody expects high prices, then future prices tend to be higher than the spot prices.
 - So, part of current high prices can be attributed to this 'bubble'.
- Difficult to estimate the impact of speculation in this story.
 - The crises on the financial markets are diverting funds away from traditional financial institutions leading to a large pool of funds available for investments in other markets.
 - There is definitely a impact of speculation in current high prices
 - Hard to say it makes X %.
 - Growing volatility in food markets due to the fact that most of hedging is based on index funds and not anymore on the 'traditional' short and long hedging. This share is less than 10% in total market volume.

- An example for the current volatility: In the 1st week of March the fluctuation of corn prices was more than 150 USD/t, which is more than last year's average corn price!
- Impact of speculation on current spike in agricultural prices is difficult to quantify. Figure 10 shows the composition of the corn futures markets broken down between commercial merchants, managed money funds and commodity index traders together with the price development in USD per bushel of corn (in red on the right-hand scale).
 - It clearly shows that not only the 'speculative' index and fund hedging but also the increase in short futures by commercial merchants contributed to the dramatic increase in corn future prices.
 - However, the managed money funds which are mostly pension funds – which diversify their portfolio now also to agricultural commodities – cut down their purchase of additional contracts on long position when prices increased dramatically (see the development of the green line in following figure).
 - A formal assessment is hampered by data and methodological problems, including the difficulty of identifying speculative and hedging-related trades.
 - A number of recent studies seem to suggest that speculation has not systematically contributed to higher commodity prices or increased price volatility.
 - For example, a recent IMF staff analysis (September 2006 World Economic Outlook) shows that speculative activity tends to respond to price movements (rather than the other way around), suggesting that the causality runs from prices to changes in speculative positions.
 - The Commodity Futures Trading Commission has argued that speculation may have reduced price volatility by increasing market liquidity, which allowed market participants to adjust their portfolios, thereby encouraging entry by new participants.

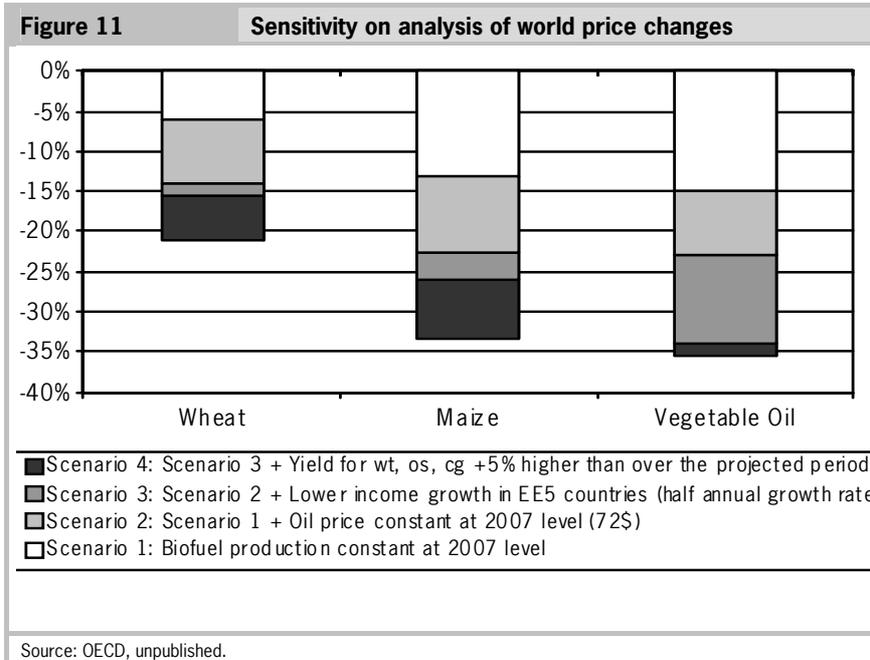
Figure 10 **CBOT Corn Market Composition January 2007 - April 2008**



4 First quantitative results of the analysis of key driving factors

- OECD Outlook 2007-2017: The OECD performed some scenarios to see the impact of various drivers on their Outlook projection (OECD 2008). This analysis highlights the outcome of a situation where biofuel policies are in place under the reference scenario and different assumptions are moderate, e.g. income growth, development of crude oil prices, etc.:
 - If biofuel production stays at its 2007 level, then world wheat prices would be 5% lower, maize 13% lower and vegetable oil 15% lower compared to the reference scenario where biofuel production in 2017 more than doubles relative to the 2007 level.

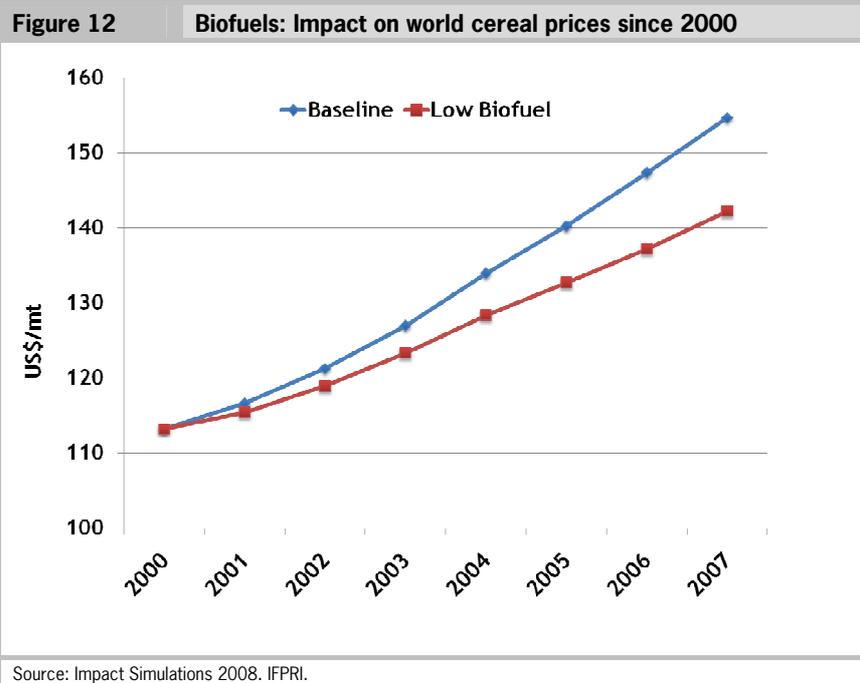
- A constant crude oil price implies 10% lower prices for all three commodities, due to the fact that the assumed high crude oil price under the reference scenario will make biofuel crops more profitable.
- Lower income growth is especially relevant for vegetable oils (more than 10%).
- Higher growth rates in yields for important biofuel crops will lower the world market prices for their production by more than 5 % for wheat and maize.



These results are inline with our own results on the impact of biofuel policies, which are presented in Figure 14 below.

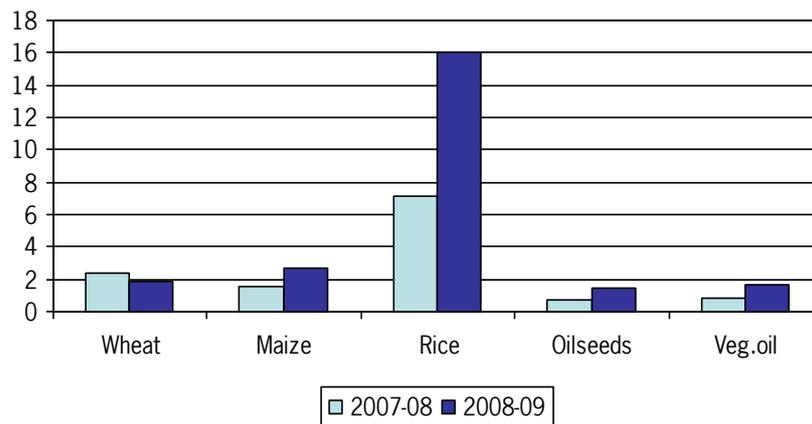
- International Food Policy Research Institute (IFPRI) study
 - The percentage contribution of biofuels demand to price increases from 2000-07 is the difference between 2007 prices in the two scenarios, divided by the increase in prices in the baseline from 2000-2007.

- The increased biofuel demand between 2000 and 2007, compared with previous historical rates of growth, is estimated to have accounted for 30 percent of the increase in weighted average cereal prices during 2000-07.
 - Maize – 39%
 - Rice – 21%
 - Wheat – 22%
- Rapid growth in biofuel demand has contributed to the rapid rise in cereal prices, but it has not been a dominant driving force in the 2000-07 period, except perhaps in the case of maize.
- The fundamentals of supply and demand seem to be playing more of a role in the rapid increase in prices during this period, especially for commodities like rice and wheat.
- After 2007 prices increases – for rice in particular – seem to be driven by the relatively ‘thin’ nature of the rice market with a limited amount of international trade compared to total production.



- Unilateral trade policy actions of individual Asian countries, which have sought to put into place export bans and import subsidies for rice.
- Speculative trading and storage behaviour; private operators taking advantage of opportunities.
- Agri-Canada quantified the impact of all the policy responses. The impact of policies added a few percent for almost all commodities, except for rice where the impact is substantial (16%).

Figure 13 Impact of export restriction policies on world prices

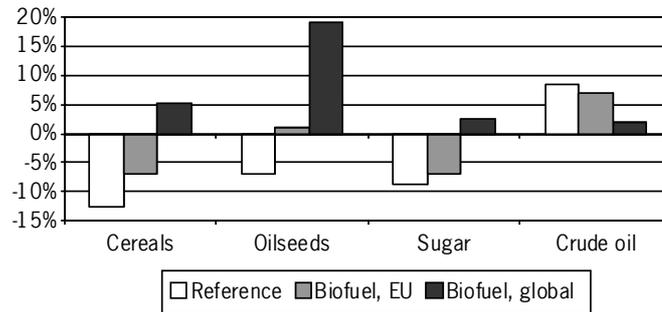


Source: Agriculture and Agri-Food Canada, unpublished.

Experts are pointing out that it is hard to quantify the separate impacts. The contribution of biofuel demand to the increase in average cereal prices of 30% presented by IFPRI was criticized by some colleagues. Some find it too high, other too low. However, all studies point out that a combination of factors was responsible for the rise. The analyses of OECD, FAPRI and also of Banse et al. (2008) indicated that the impact on world price levels is commodity specific. For corn the impact is relatively high due to the fact that most US ethanol production is corn-based. For other cereals – e.g., wheat and rice, where the use for biofuels is almost zero – only indirect effects over the land use affects the world price level. For those commodities an estimated increase of 30% – as indicated in the IFPRI estimates – seems to be rather high.

5 The future

- High prices are their own worst enemy. Increased profit margins entice entrepreneurial investment, which results in increased production. Lower market prices inevitably follow. The 'invisible hand' of Adam Smith ensures that winners' gains and losers' losses will be temporary, as entrepreneurs correct market imbalances. In the USA, in the 2008 spring planting farmers are shifting from maize to wheat and soybeans, setting the prices of the latter on a downward trajectory and stabilising the price of the former.
- Higher prices induce more production as planted areas increase and available arable land will be used more intensively. Therefore, the current situation is not structural and as a result prices will go down again. However, first stocks have to be built up again. Both effects take some time. In Brazil and Russia there are ample opportunities as additional land can be taken into production, whereas in many other countries production can only be higher due to intensification. According to USDA analyses, Russia, Ukraine and Argentina can become one of the world's top grain exporters.
- R&D investments in agriculture (e.g. yields, etc) become more profitable with higher food prices.
- Strategic stocks are essential to limit price volatility in world agricultural markets, but they are costly.
- The expected impact on world prices of the 10% EU-biofuel directive and the various global biofuel initiatives is depicted in the graph below (Banse et al, 2008). If all initiatives are implemented together and technological change stays on the historic trend, then the impact on world prices is substantial. The arrival and impact of second-generation biofuels is uncertain. According to Banse et al. (2008), biofuels lead to higher agricultural income, land use and land prices, and a loss of biodiversity.

Figure 14**Change in real world prices, in percent, 2020 relative to 2001**

Source: Banse, M., H. van Meijl, A. Tabeau and G. Woltjer (2008), Will EU Biofuel Policies affect Global Agricultural Markets?, *European Review of Agricultural Economics* (forthcoming).

- Development of oil prices is crucial for the development of biofuels. Some experts point that prices stay high due to increased demand in Asia and depleting supply resources. Others indicate that this is a temporary situation as capacity is lacking at the moment due to too few investments in the past. If oil prices stay high, food and energy markets will be more interlinked. The oil prices will then put both a floor and a ceiling¹ for prices in the food markets (Schmidhuber, 2007). As energy markets are more elastic, the long-term trend of food prices might be changed (less negative to positive dependent on development oil price).
- High feedstock prices make biofuels less profitable (ceiling effect), as does a low oil price (floor effect). Even at current level of crude oil prices of 120 USD per barrel almost no biofuels are economically viable without policies. A low oil price implies that only biofuels will be produced under mandates or

¹ Ceiling price effect: as feedstock costs are the most important cost element of all (large scale) forms of bioenergy use, feed stock prices (food and agricultural prices) cannot rise faster than energy prices in order for agriculture to remain competitive in energy markets. Floor price effect: If demand is particularly pronounced as in the case of cane-based ethanol, bioenergy demand has created a quasi intervention system and an effective floor price for sugar in this case.

that they are heavily subsidized. Without an increase in oil prices the impact of biofuels is therefore limited to the impact of filling the mandates.

- The interrelation with the energy markets may slowdown or reverse Cochrane's treadmill or Owens development squeeze which imply declining real agricultural prices, less farmers, larger scale farming and possible depopulated areas.
- Volatility of world prices might be an important problem in the future that causes hunger in terms of very high prices for poor consumers and problems for poor farmers when prices are low. The ceiling and especially the floor may act as an intervention price in case of very volatile prices. A floor may also stimulate agriculture in the (poor) world. Hunger is not a problem directly related with biofuels but often of bad policies, and improperly functioning factor and commodity markets.¹ In principle, there is enough food in the world but there is a distribution problem.
- Rising food commodity prices tend to negatively affect lower income consumers more than higher income consumers. First, lower income consumers spend a larger share of their income on food. Second, staple food commodities such as corn, wheat, rice, and soybeans account for a larger share of food expenditures in low-income families. Third, consumers in low-income, food-deficit countries are vulnerable because they must rely on imported supplies, usually purchased at higher world prices. Fourth, countries receiving food aid donations based on fixed budgets receive smaller quantities of food aid. A simplified comparison of the impact of higher food commodity prices on consumers in high-income countries and on consumers in low-income, food-deficit countries illustrates these differences (see Table 1).

¹ AG assessment (2008), "Policy options for improving livelihoods include access to microcredit and other financial services; legal frameworks that ensure access and tenure to resources and land; recourse to fair conflict resolution; and progressive evolution and proactive engagement in Intellectual Property Rights (IPR) regimes and related instruments."

Table 1	Impact of Higher Food Commodity Prices on Consumers' Food Budgets	
	High income countries	Low income, food deficit countries
Initial Situation		
Income	€ 40,000	€ 1,000
Food Expenditure	€ 4,000	€ 500
Food Costs as % of Income	10%	50%
30% increase in food prices		
new costs for total food expenditure	€ 5,200	€ 650
Food Costs as % of Income	13%	65%
Source: Own compilation.		

- This illustrative comparison shows that for a consumer in a high-income country a 30-percent increase in food prices causes food expenditures to rise 3 percent (€1200), while for a consumer in a low-income country food expenditures increase by 15 percentage points.

6 Concluding remarks

The motivation at the origin of this memo can be summarised in four questions:

- Is the current price increase driven by real or monetary issues (notably a speculation phenomenon)?
- Are natural resource and basic food commodity prices linked together?
- Is the shortfall in production also linked to governance issues that limit investment and production?
- To what extent is the underused capacity in land and man-power a result of lack of investment capacity, both at the micro level (tools and seed) and at the macro level (storage and transportation infrastructure)?

The work on these questions allows the formulation of responses, and also some broader observations.

From our work it is clear that the price increases have several roots and that a normally functioning market will in time provide a certain degree of corrective action. But policy/political decisions can prevent the market from doing so. In any case, the time lapse for the market to act does not remove the acuity of the price distortion that affects the poorest people, and urgent intervention is necessary to alleviate the effects of short-term price peaks.

Natural resource prices *lead* basic food commodity prices; the rate of growth of the former has historically been (and is again at present) higher than the latter. Biofuels create a more direct link between food and fuel prices, if fuel prices are high: the long-term trend of declining real food prices might be dampened or reversed.

The influence of policy/political decisions mentioned above is certainly present when considering why production in many countries is below the potential capacity to produce food. Not only has land been voluntarily removed from production in some cases, but the access to technology and markets is sometimes also limited by factors that are strictly in the realm of governance. But then there are also potential producers, who simply can not make it into the market, and they can be assisted through micro-credit or through the donation of tools, seeds and the development of irrigation, storage capacity and transportation facilities to integrate into market structures.

Our further observations are of several orders, and these are with regard to policy implications, market failure, social equity, and required policy action.

Policy implications

With regard to the EU, CAP reform was designed to enforce farmers' reaction to market signals. There should be no surprise, therefore, when farmers do, and therefore production falls close to the level of world demand. The problem, however, is the time lag between the demand in the market and a farmer's decision on what – and how much – to plant. There is always some degree of 'inadequate' response on the supply side. Around the world, farmers are now responding to price signals and are increasing their production of cereals. Building up and managing stocks is not the primary responsibility of farmers, and in a free market this is left to traders; some government intervention might be considered, but a return to automatic intervention based solely on commodity prices should be absolutely avoided!

Will current price level persist?

High prices can only 'cured' by high prices. This may initially seem to be a provocative statement, but the simple fact is that – as stated above – farmers do react to price signals. So do all the other agents in the economy, including speculators! The food price 'crisis' will certainly be prolonged through protective measures by national governments, although the issue of civil stability may encourage some governments to take such actions, to reassure their populations that 'something is being done'. Biofuels, however, create a more direct link between food and fuel prices and if fuel prices increase further, the long-term trend of declining real food prices might be dampened or reversed.

Who is mostly affected?

The consumers of food in low-income countries with food and energy deficits are those who will suffer most in any sudden or rapid price shift for basic commodities, of which foremost is food. In principle, current high prices provide additional income opportunities for farmers. Whether farmers in developing countries will benefit from current high prices on world food markets remains questionable and depends on the degree of integration of regional in global food markets. But if there is no structural market failure involved *per se*, as stated above, then this means that the conditions of productivity and market access are the priorities that have not been addressed successfully for a long period of time *before* a price crisis occurs.

Required policy action

Short-term action is to urgently increase spending on food aid (which has gone down during the last years). Long-term production capacity improvement (including publically financed agricultural research) is essential to avoid repeated price crises. The current crisis is not a crisis in terms of shortage of food, but a crisis in terms of income shortage (in terms of purchasing power and of investment potential to increase productive capacity). Policy measures should enable especially the poor to be able to participate in the economy, and therefore for the poor countries to generate income within a world market.