Global Commodity Paper #6

The Merrill Lynch Biofuels Indices (MLCXB & MLCXBP)

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Liquid, transparent & efficient indices to access biofuels

The ethanol and biodiesel industries have expanded rapidly in the past decade, attracting a lot of investor interest and putting upward pressure on agricultural commodity prices. To date, investors looking to gain exposure to this theme have mostly resorted to traditional front-to-second month rolling agricultural commodity indices. However, these traditional agriculture index investments typically suffer from very negative roll returns (or the cost of rolling front-month futures positions forward) due to the prevalent contango structure in some agricultural markets. To allow investors to gain exposure to biofuels markets in a liquid and efficient way, we are now introducing the MLCX Biofuels and the MLCX Biofuels Plus Indices.

Agriculture storage dynamics can affect index performance

While many commodities linked to the biofuels frenzy have experienced strong spot price appreciation in the last five years, negative roll returns have been a drag on the performance of wheat, corn and canola index investments. At the same time, crops like sugar and soybeans have experienced spot price appreciation with much more favourable roll returns. Roll returns in agriculture index investments are closely associated with storage dynamics. For instance, soybeans production is split between the northern and southern hemisphere, where harvests occur at different times of the year, thus reducing the need for smoothing out supply through a large inventory build up. Hence, backwardation is a more common market structure in soybeans than it is in corn or canola.

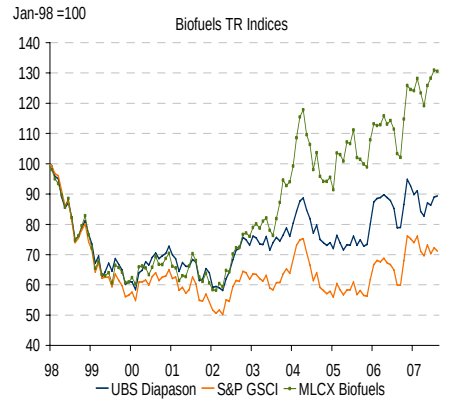
Weighing agriculture by calorific value may boost returns

By using calorific values to adjust world production figures, the MLCX Biofuels indices overweight energy-rich agricultural commodities used as feedstock in biofuel production. In particular, the MLCX Biofuels indices provide greater exposure to crops such as sugar or soybeans than traditional indices, limiting exposure to contango market structures. Thus, on our back-testing, the outperformance of the MLCX Biofuels Indices relative to traditional indices comes from lower exposure to structural contango markets such as corn, as well as from enhanced roll mechanics.

MLCX Biofuels indices profit from enhanced roll mechanics

The MLCX Biofuels indices benefit from the enhanced roll mechanics of the MLCX family, namely a 15-day window where second-month futures contracts are rolled into third-month contracts. On our backtesting, the MLCX Biofuels Index outperforms competing indices by 8%, while maintaining a correlation of 80%. In addition, we are launching the MLCX Biofuels Plus Index. This investment vehicle incorporates gasoline and diesel to the MLCX Biofuels commodity portfolio, providing a more accurate representation of the global transportation fuel mix and further limiting the effects of negative roll yields in agriculture commodities.

Chart 1: Once the roll mechanics are factored in, the MLCX Biofuels Total Return index fares well relative to other biofuels indices



Source: Bloomberg, Merrill Lynch Commodity Research

Table 1: Biofuels TR Indices

	UBS Diapason Biofuels	S&P GSCI Biofuels	MLCX Biofuels
Total return	5.9%	4.8%	13.5%
Volatility	14.3%	16.5%	16.5%
Sharpe-ratio	22.3%	12.5%	65.5%

Source: Bloomberg, Merrill Lynch Commodity Research
*Based on annualized monthly returns from Jan-02 to Aug-07

Refer to important disclosures on page 28. Analyst Certification on page 27.

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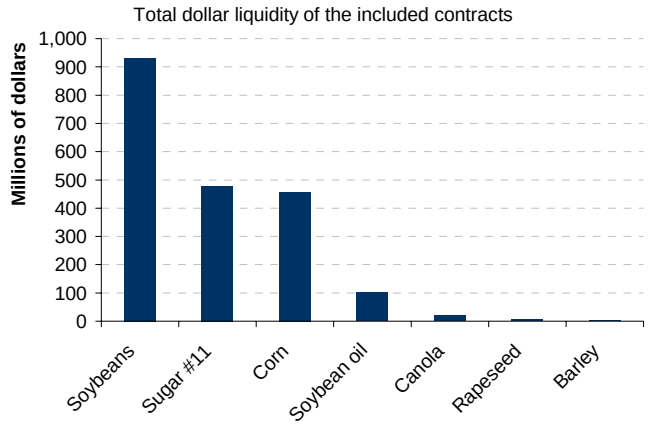
1. Introducing the MLCX Biofuels Indices

The ethanol and biodiesel industries have expanded rapidly in the past decade, putting upward pressure on agricultural commodity prices and attracting a lot of investor interest. Unfortunately, the liquidity of financial instruments directly linked to biofuels is still fairly low, and investors have resorted to some of the more traditional agricultural commodity indices to gain exposure to this theme in recent years. In our view, however, these traditional index investments typically carry too much negative roll yield exposure due to the prevalent contango structure in agricultural commodity markets. To allow liquid access to biofuels markets and limit the problems associated with negative roll returns, we have designed the MLCX Biofuels Index and the MLCX Biofuels Index Plus.

Ensuring liquidity and representation

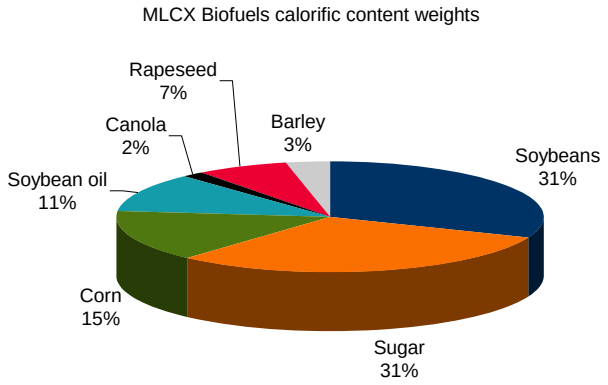
To ensure liquidity and representation in the MLCX Biofuels indices, we have selected a broad range of commodities that are either biofuels themselves or feedstock commonly used in the production of biofuels. We restrict the universe of commodities to those that have a liquid futures contract traded in member countries of the Organization for Economic Cooperation and Development ("OECD"). Among these commodity contracts, we only consider those with average daily trading volumes above a certain threshold to ensure a high degree of liquidity.

Chart 2: The eligible contracts are ordered by liquidity based on price and volume data of their front-month contract



Source: Bloomberg, Merrill Lynch Commodity Research
Note: data refers to Aug-05 to July-06

Chart 3: The MLCX Biofuels index primarily provides exposure to sugar, soybeans and corn



Source: Merrill Lynch Commodity Research

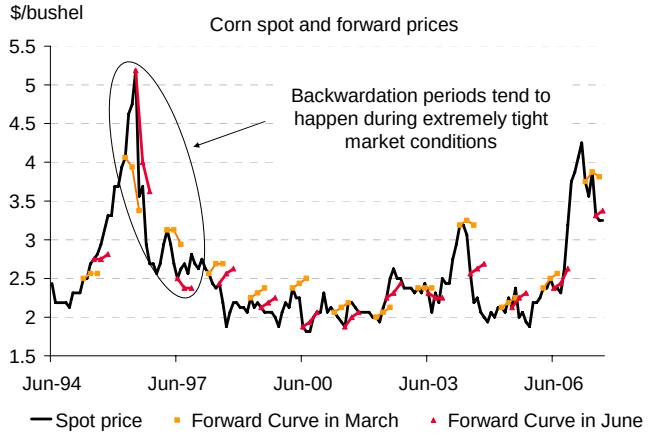
The eligible commodities are then ordered by liquidity, measured as the total traded value (price x volume) of the front-month contract for each particular commodity market (Chart 2). The most liquid contracts are then included in the MLCX Biofuels Index, ensuring diversification and representation (Chart 3). However, the MLCX Biofuels Index eliminates redundant contracts in those commodity markets where there is more than one liquid contract for the same raw material. For instance, the index includes a Sugar #11 (NYBOT) contract, but excludes the White Sugar (EURONEXT – LIFFE) contract on the grounds that it is redundant to have both in the index.

Roll returns, the shape of the forward curve and the economics of storage

Biofuels feedstock prices are intrinsically connected to ethanol and biodiesel prices, but their storage dynamic is similar to many other agriculture products. In commodities, the shape of the forward curve is connected to the economics of storage. The difference between the spot price and the forward price embeds not just expectations about future prices but also the benefits and costs of carrying the physical commodity over time. If the cost of storage is sufficiently high, storing the physical commodity to deliver it in the future becomes less profitable than selling the commodity in the spot market. As market participants sell the commodity instead of storing it, spot prices weaken relative to forward prices, steepening the forward curve.

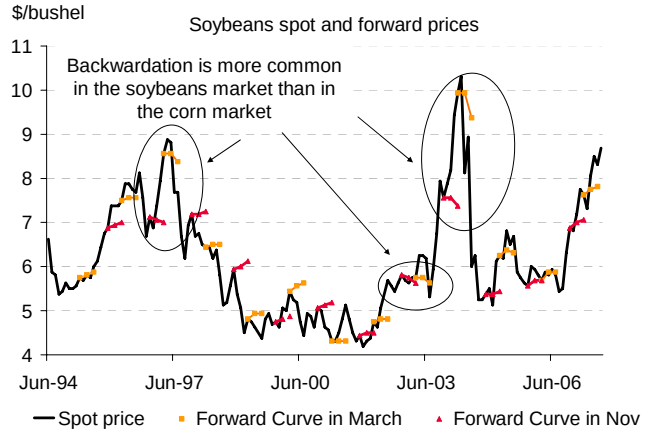
Because of the seasonality in production, certain crops tend to come into the market around a very specific time of the year. For example, corn tends to be harvested in the northern hemisphere – where the bulk of the world production is located – between the months of August and November. Therefore, storage is highly valuable in this market as it is used to smooth out corn supply throughout the year. The positive value of storage naturally tends to push forward prices above spot prices as the price differential reflects the cost of storing the physical commodity and carrying it over time. Because of the seasonal supply, demand and inventory dynamics of the corn market, the corn forward curve only tends to go into backwardation under extremely tight market conditions (Chart 4), when inventories reach critically low levels.

Chart 4: Mostly a northern hemisphere crop, corn is harvested once a year. Hence, the need to store it and the contango term structure



Source: Bloomberg, Merrill Lynch Commodity Research

Chart 5: Soybeans are naturally grown on both hemispheres, limiting the role of storage and increasing the likelihood of backwardation

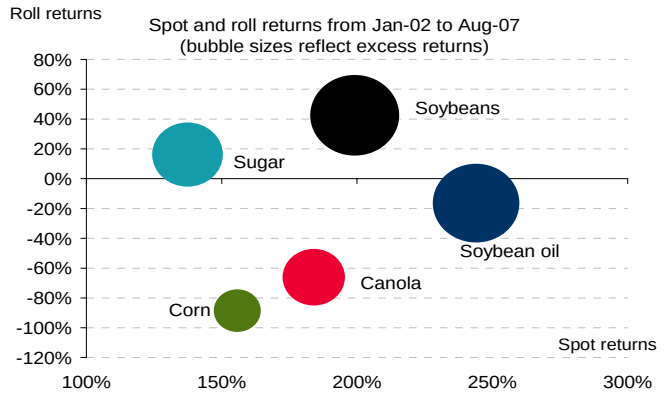


Source: Bloomberg, Merrill Lynch Commodity Research

Although still present, this seasonality effect is not as strong in other markets. For instance, soybeans production is much more evenly split between the northern and the southern hemisphere with the US, Brazil, Argentina and China being the largest producers in the world. The northern and southern hemisphere harvests naturally occur at different times of the year, reducing the need for smoothing out supply through a large inventory build up. Hence, storage in the soybeans market is much less of an issue than in the corn market. As a result, backwardation is much more common in soybeans than in corn (Chart 5).

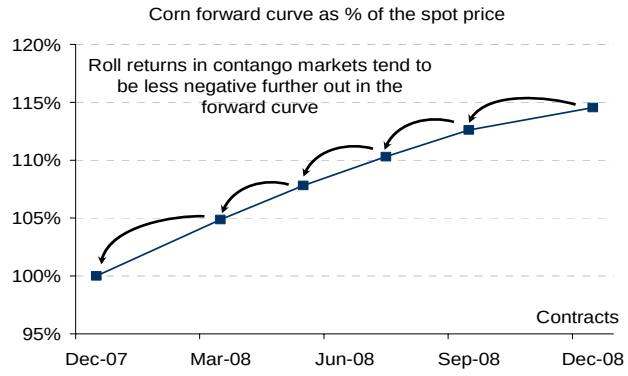
While many commodities linked to the biofuels frenzy have experienced strong spot price appreciation in the last five years, negative roll returns have been a drag in the overall performance of commodities such as corn and canola (Chart 6). At the same time, crops like sugar and soybeans have experienced similar spot price appreciation with much more favourable roll returns. As a result, the negative returns generated by rolling nearby contracts into contracts with longer maturity (Chart 7) in the last five years dragged corn investments performance well below other commodities such as soybeans, sugar and soybean oil.

Chart 6: Roll returns have been a drag on the overall performance of some index investments such as corn, but not in others like soybeans



Source: Bloomberg, Merrill Lynch Commodity Research

Chart 7: The constant negative returns generated by rolling nearby corn contracts into longer maturity contracts eroded performance



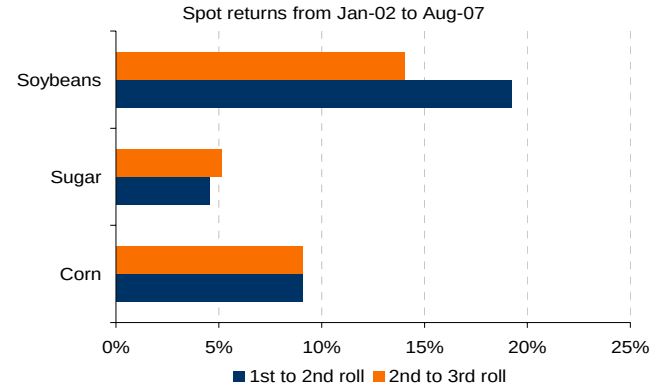
Source: Bloomberg, Merrill Lynch Commodity Research

Extracting alpha from the enhanced MLCX roll

Just as in the original MLCX Index, we have kept a very close eye on the roll mechanics of each commodity when designing the MLCX Biofuels. We tested a broad range of strategies to better exploit the structural characteristics of the commodities included in the index. Because liquidity tends to dry out quickly as maturity increases, we have chosen to roll 2nd nearby contracts into 3rd nearby contracts instead of the traditional 1st-nearby into 2nd-nearby roll used by the S&P GSCI Index and the DJ-AIG Index.

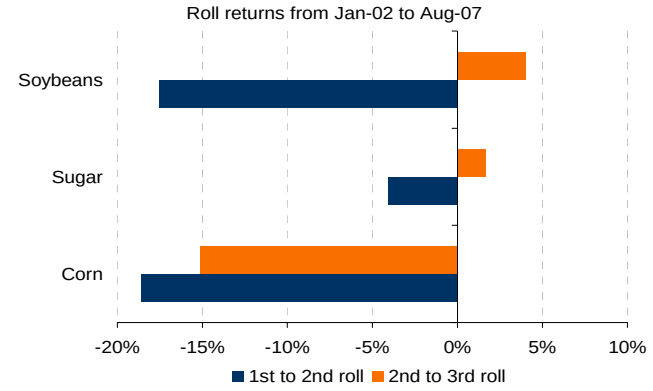
This rolling strategy – which was originally developed for the MLCX Index – is particularly beneficial in commodities that frequently trade in contango. Spot returns are often uniformly distributed across the contracts in the forward curve (Chart 8). However, the same is not true of roll returns. Contracts farther out in the forward curve tend to generate higher roll returns than rolling contracts on the front-end of the curve (Chart 9). In the case of soybeans and sugar for instance, rolling contracts further out in the forward curve may be extremely advantageous.

Chart 8: Spot returns are often uniformly distributed across the contracts in the forward curve...



Source: Merrill Lynch Commodity Research

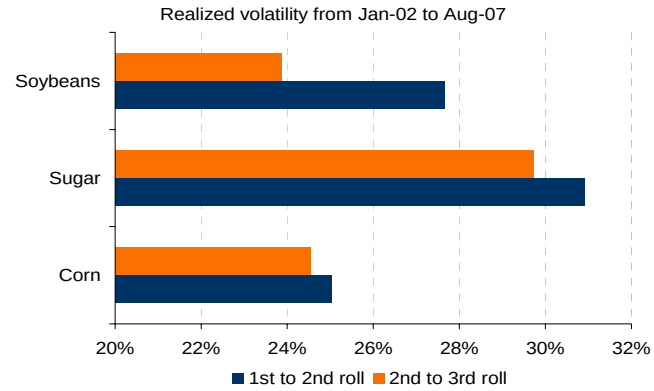
Chart 9: ...however roll returns are not, and positions farther out in the forward tend to generate higher roll returns than in the front



Source: Merrill Lynch Commodity Research

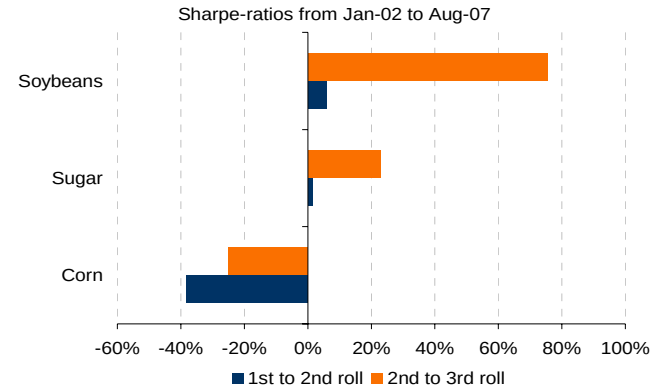
At the same time, rolling contracts farther out in the forward curve typically reduces volatility of commodity investments. For certain commodities such as soybeans, there is a significant difference between the two rolling strategies in terms of volatility (Chart 10). In 2nd to 3rd nearby month rolling strategies, the combination of higher roll returns and lower volatility pushes up risk-adjusted returns relative to traditional rolling strategies (Chart 11).

Chart 10: Rolling contracts farther out in the forward curve typically reduces volatility of commodity investments



Source: Merrill Lynch Commodity Research

Chart 11: In 2nd to 3rd nearby month rolling strategies, higher roll returns and lower volatility push up risk-adjusted returns



Source: Merrill Lynch Commodity Research

Weights represent the calorific potential of the commodity

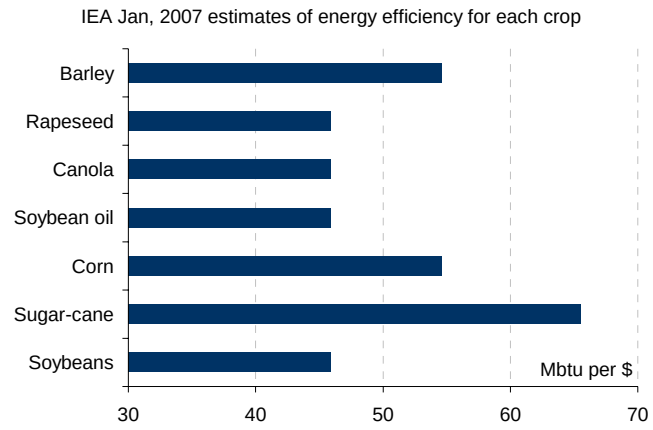
The MLCX Biofuels is devised to present an accurate representation of the value of each commodity in terms of its energy potential under today's technology. In order to obtain estimates of the calorific potential of each commodity, we estimate the total production value of each commodity market using world production data for the 2005/06 market year and average prices of the front-month contract between July, 1st, 2005 and June, 30th, 2006.[1]

After estimating the total dollar value of world production for each commodity, we convert those dollar values into total calorific content. To obtain an estimate of the calorific content of each commodity included in the index, we use January 2007

[1] For certain commodities, such as barley and corn, we restricted ourselves to food, seed and industrial (FSI) consumption instead of production because much of the world production is used as animal feed.

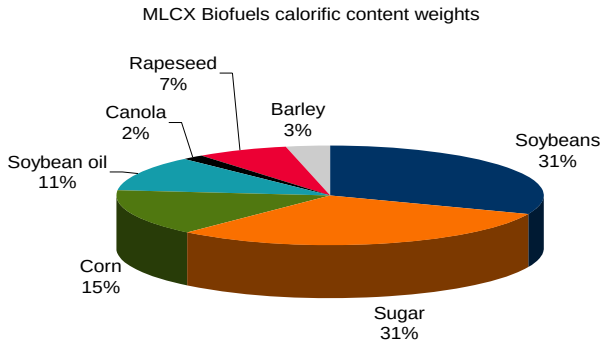
IEA estimates of energy efficiency for each feedstock (Chart 12). The MLCX Biofuels weights are then computed to reflect the energy potential of each feedstock included in the index (Chart 13). We have implemented the same methodology and produced a back-filled history for the MLCX Biofuels Index going back to July 1990.

Chart 12: We use January 2007 IEA estimates of energy efficiency for each feedstock



Source: IEA, Merrill Lynch Commodity Research

Chart 13: The MLCX Biofuels weights are then computed to reflect the energy potential of each feedstock included in the index

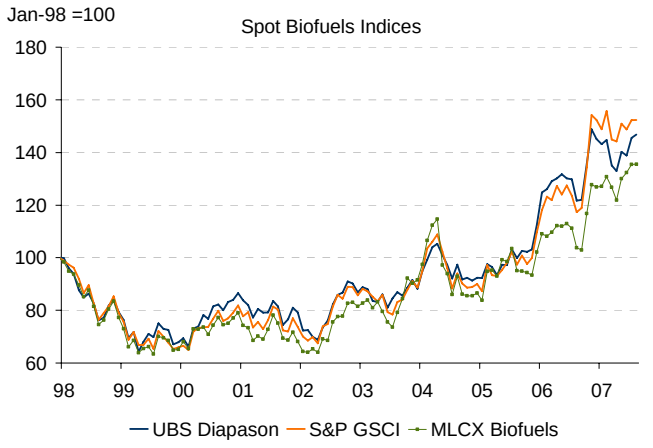


Source: Merrill Lynch Commodity Research

Putting it all together to generate smarter beta

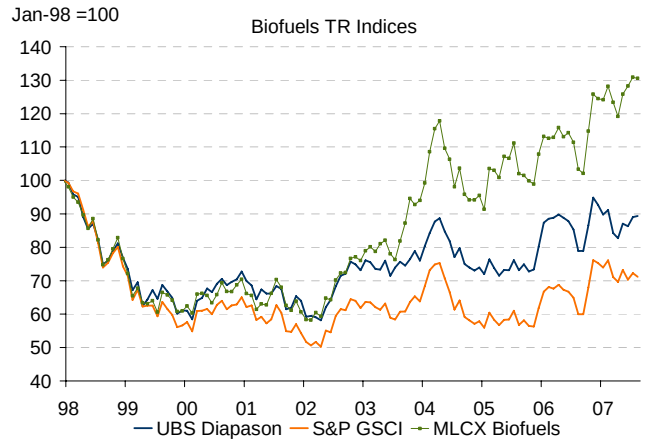
At present, there are only a few commodity indices available in the market that are exclusively linked to biofuels. Two of the most popular ones are the S&P GSCI Biofuels Index and the UBS Diapason Biofuels Index. These indices provide investors with exposure to biofuels feedstock through commodity futures just like the MLCX Biofuels indices. However, investors exposed to the MLCX Biofuels Index benefit from the enhanced rolling strategy, likely capturing additional benefits. On our back-test, the MLCX Biofuels Spot index is closely correlated to the other indices in the market (Chart 14). However, once the roll mechanics are factored in, the MLCX Biofuels Total Return index fares well relative to other biofuels indices currently available in the market (Chart 15).

Chart 14: On our back-test, the MLCX Biofuels Spot index is closely correlated to the other indices in the market



Source: Bloomberg, Merrill Lynch Commodity Research

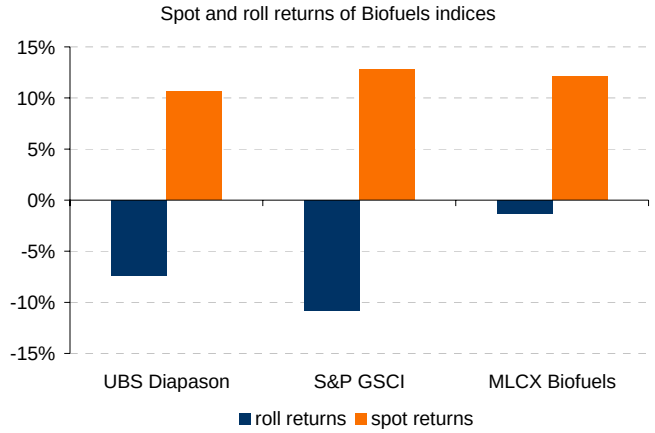
Chart 15: Once the roll mechanics are factored in, the MLCX Biofuels Total Return index fares well relative to other biofuels indices



Source: Bloomberg, Merrill Lynch Commodity Research

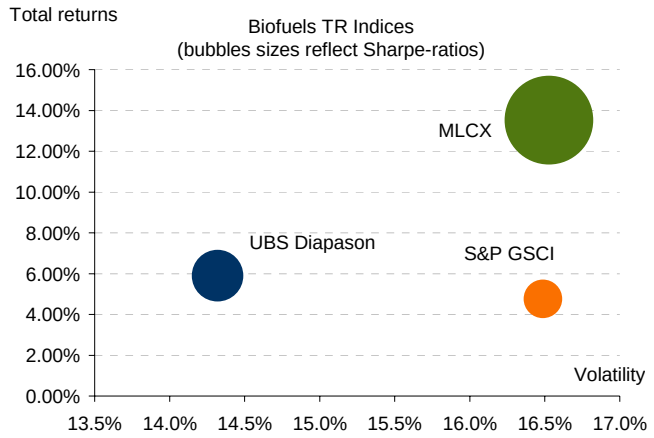
In fact, there are important differences among these commodity indices. For instance, while the UBS Diapason Index is composed of 10 different commodities, the S&P GSCI biofuels contains only 4 contracts. However, price movements on those commodities have moved largely in line and the degree of correlation between the MLCX Biofuels spot Index and the other two indices is around 80%, highlighting the importance of corn, soybeans and sugar in all these vehicles. The important difference between the MLCX Biofuels Index and other indices comes exactly from its ability to exploit structural characteristics of the biofuels feedstock market. For instance, unlike other indices, the enhanced roll strategy of the MLCX Biofuels is able to largely mitigate the negative roll-returns common to agricultural commodities, enhancing Sharpe ratios (Charts 16 and 17).

Chart 16: Roll mechanics matter a lot in agricultural investments, and minimizing the effect of the negative roll yield is critical



Source: Bloomberg, Merrill Lynch Commodity Research
*Based on annualised monthly log-returns from Jan-02 to Aug-07

Chart 17: The MLCX Biofuels enhanced roll strategy provides a good risk-return profile



Source: Bloomberg, Merrill Lynch Commodity Research
*Based on annualised monthly log-returns from Jan-02 to Aug-07

Hence, while giving investors beta exposure to biofuel feedstock prices, the MLCX Biofuels enhanced roll strategy also provides a superior risk-return profile. On our back-test, the MLCX Biofuels Index generated considerable outperformance over similar indices (Tables 2 and 3), mostly as a result of these improved index mechanics.

Table 2: Annualized monthly returns from Jan-02 to Aug-07

	UBS Diapason	S&P GSCI	MLCX Biofuels
Total return	5.9%	4.8%	13.5%
Volatility	14.3%	16.5%	16.5%
Sharpe-ratio	22.3%	12.5%	65.5%

Source: Bloomberg, Merrill Lynch Commodity Research

Table 3: Annualized monthly returns from Jan-02 to Aug-07

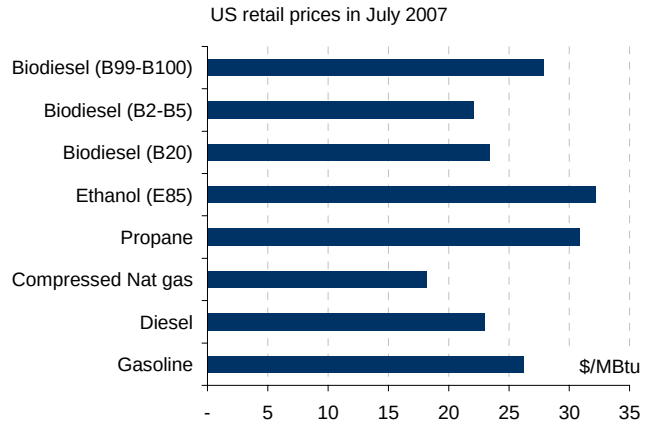
	UBS Diapason	S&P GSCI
MLCX alpha* relative to benchmark	7.92%	9.20%
MLCX beta* relative to benchmark	0.95	0.91

Source: Bloomberg, Merrill Lynch Commodity Research
* Alpha and beta coefficients are annualised intercept and slope of a linear regression of MLCX Biofuels TR Index monthly log-returns on the benchmark's monthly log-returns.

The MLCX Biofuels Plus Index (MLCXBP)

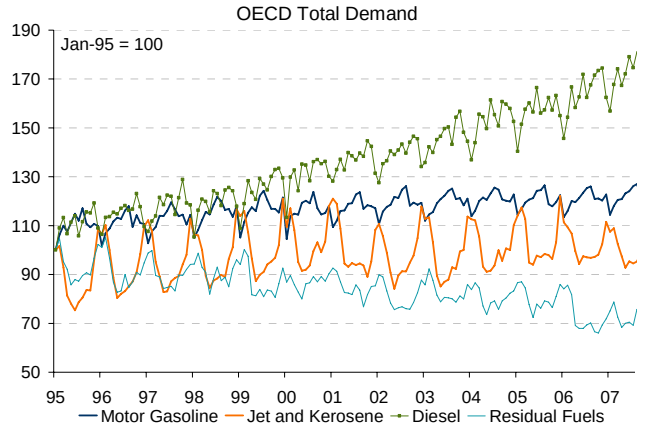
In addition, we are launching the MLCX Biofuels Plus Index. This investment vehicle incorporates gasoline and diesel to the MLCX Biofuels commodity portfolio, providing a more accurate representation of the global transportation fuel mix and further limiting the effects of negative roll yields in agriculture commodities. The prospects for growth in biofuels usage cannot be disentangled from the growth in transportation fuels around the world. Biofuels struggle to compete with conventional fossil fuels such as gasoline, diesel or nat gas, even considering the enormous amount of government incentives that support their adoption (Chart 18). Still, the fast growth of the biofuels industry is largely a bi-product of the incredible growth seen in the demand for transportations fuels in general (Chart 19).

Chart 18: Biofuels compete with conventional fossil fuels such as gasoline, diesel and compressed nat gas



Source: DOE, Merrill Lynch Commodity Research

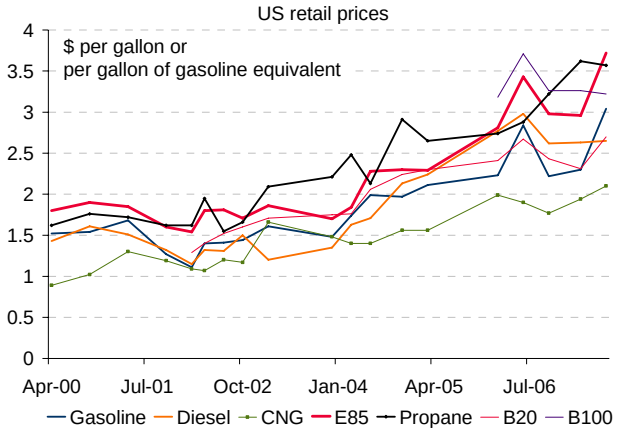
Chart 19: The fast growth of the industry is largely a bi-product of the incredible growth seen in the demand for transportations fuels



Source: IEA, Merrill Lynch Commodity Research

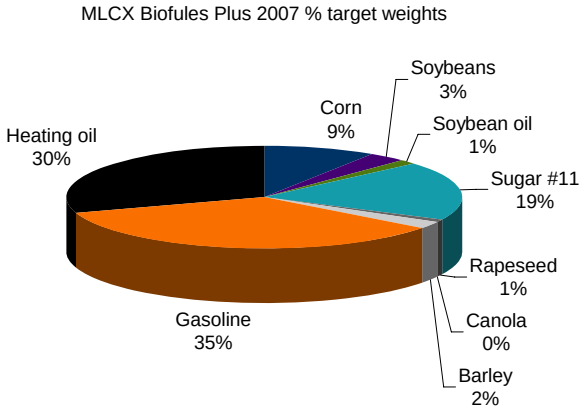
The wide use of alternative fuels still faces serious constraints. At the current level of technology and infrastructure, biofuels are more likely to complement conventional fossil fuels as blending components rather than offer a true alternative to conventional fuels. The blending of biofuels with conventional fuels creates a natural link between the products. As a result, conventional fuels and biofuels prices have been moving largely in line over time (Chart 20).

Chart 20: The blending of biofuels with conventional fuels creates a natural link among prices



Source: DOE, Merrill Lynch Commodity Research

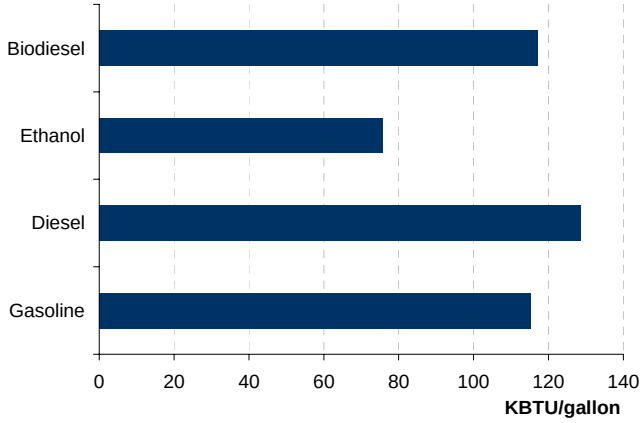
Chart 21: We have created a basket that allows investors to play the combined theme of biofuels and conventional fossil fuels together



Source: Merrill Lynch Commodity Research

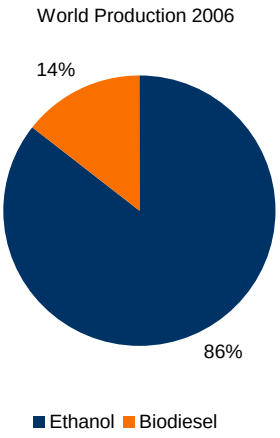
As we believe that alternative and conventional fuels are likely to combine forces to supply global energy needs, we have created a basket of commodity futures that allows investors to play the combined theme of biofuels and conventional fossil fuels together (Chart 21). We have implemented the same methodology as the one implemented for the MLCX Biofuels Index to come up with calorific content weights for the basket of commodities (Chart 22).

Chart 22: We have considered calorific content of different fuels ...



Source: DOE, Merrill Lynch Commodity Research

Chart 23: ... but also their usage to avoid over representation

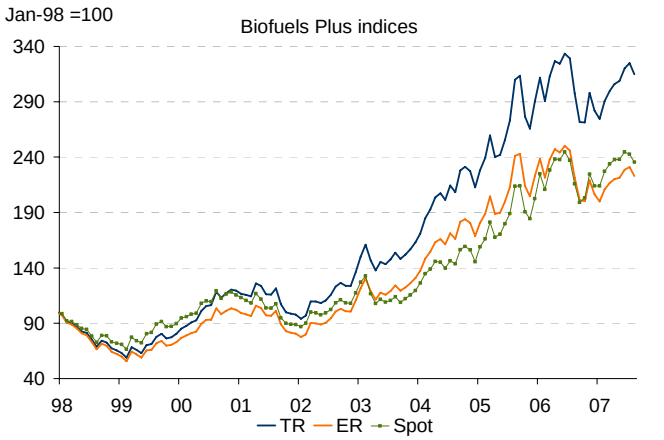


Source: IEA, Merrill Lynch Commodity Research

Until recently, ethanol usage was largely concentrated in low-percentage blends such as E10 (10% ethanol + 90% gasoline). However, following its successful applications in Brazil for many years, there is now considerable interest in ethanol-gasoline blends above 85% (such as E85). Flexible-fuel vehicles that can run on E85 fuel are now sold in large numbers on many new automobile dealerships in the US. Lower-level biodiesel blends such as B20 can actually be used directly in heavy-duty diesel engines without any adjustments to the engine or fuel system, providing a direct competitor to fossil diesel.

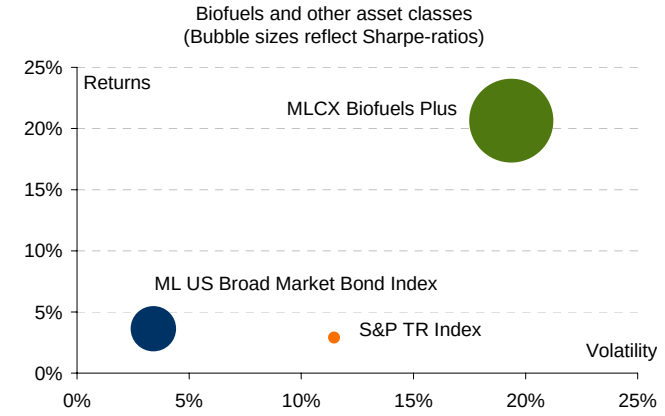
To create the MLCX Biofuels Plus Index, we have then added gasoline and diesel to the basket of commodities included in the MLCX Biofuels Index. We have adjusted the calorific weights of gasoline and diesel to their participation in EB85 and B20, which are likely to be the blended fuels experiencing the largest demand growth in the near future. That is, we have considered only 15% of gasoline's calorific weights and 80% of diesel's calorific weights. To avoid over-representation, we consider that the ethanol market is much larger than the biodiesel market and rebalance the commodity weights to reflect the share of each biofuel in world production (Chart 23). The result of this analysis is a basket of commodities linked to transportation fuels that has performed well in recent years (Charts 24 and 25).

Chart 24: The MLCX Biofuels Plus is a basket of commodities linked to transportation fuels that has shown outstanding performance ...



Source: Merrill Lynch Commodity Research

Chart 25: ... even relative to other asset classes



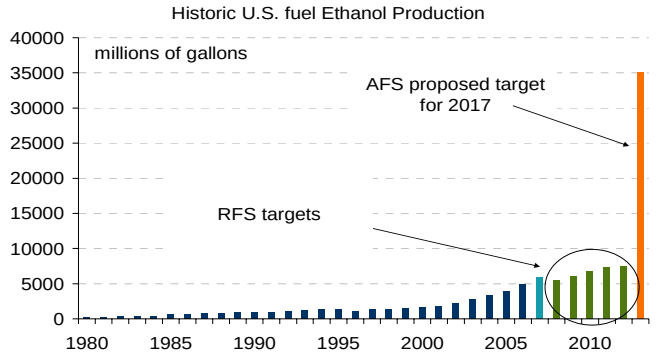
Source: Bloomberg, Merrill Lynch Commodity Research
*Based on annualised monthly log-returns from Jan-02 to Aug-07

2. Biofuels and the new face of World Agriculture

Policy wave will boost agriculture demand for years

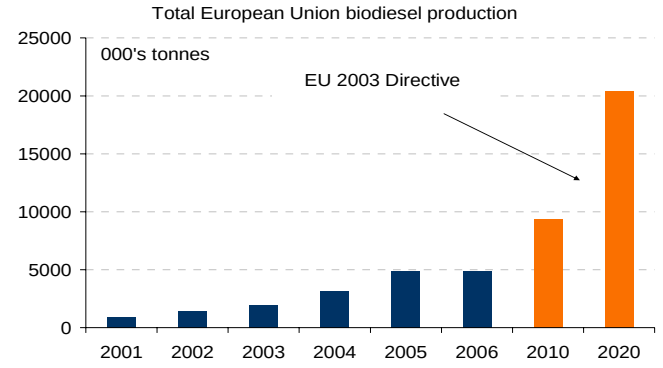
In effect, we expect demand for agricultural commodities to remain supported for years to come by the wave of ambitious policies targeting the increased use of renewable fuels. For instance, Australia, Brazil, Canada, China, Japan, India, Thailand, the United States or the European Union have all designed policies that aim to increase ethanol production and use. In the US alone, the Renewable Fuel Standard program (RFS)—authorized by the Energy Policy Act of 2005—requires that at least 7.5 billion gallons of renewable fuel to be blended into vehicle fuel by 2012. Calling for a 20% reduction in gasoline use within 10 years, the Bush Administration's Alternative Fuel Standard (AFS) proposal establishes a minimum use of 35 billion gallons of renewable and alternative fuels by 2017 - almost five times the RFS target (Chart 26).

Chart 26: The RFS program in the US requires 7.5 billion gallons of renewable fuel to be blended into vehicle fuel by 2012



Source: RFA, Merrill Lynch Commodity Research

Chart 27: EU-03 directives target 5.75% of total transport fuel use to be derived from biofuels by 2010 and up to 20% by 2020



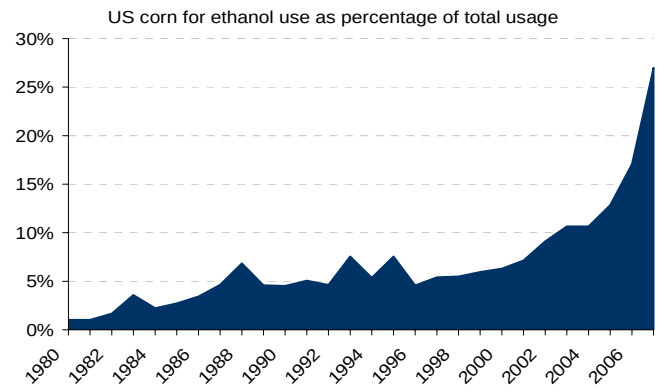
Source: EBB, Merrill Lynch Commodity Research

Member States of the European Union are currently developing strategies to cope with the EU directives adopted in 2003 of having 5.75% of total transport fuel consumption being derived from biofuels by 2010 and up to 20% by 2020 (Chart 27). Although many Member States are failing to meet their 2010 targets, the EU is still signalling a genuine determination to increase the share of biofuels in transport. Additionally, emission trading systems and the Clean Development Mechanism (CDM) established under the Kyoto Protocol are likely to finance projects and technology related to biofuels around the globe.

Biofuels are migrating into cropland

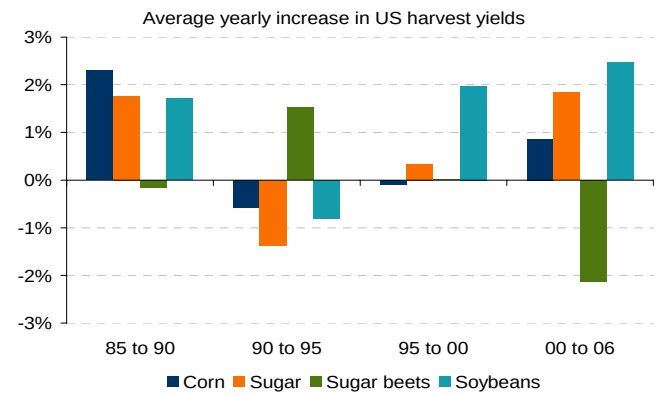
According to IEA estimates, feedstock costs are almost 80% of ethanol and 70% of biodiesel total costs. Hence, ethanol and biodiesel supply depends crucially on feedstock availability. In the US, the share of ethanol demand on total corn usage has skyrocketed in the last decade (Chart 28). According to some IEA estimates, the US and the EU union may have to dedicate around 20% of their total cropland area to biofuel feedstock production in order to meet their 2010 production targets. This number may have to increase to around 40% by 2020 according to the same estimates.

Chart 28: The share of ethanol demand on total US corn usage has skyrocketed in the last decade



Source: USDA, Merrill Lynch Commodity Research

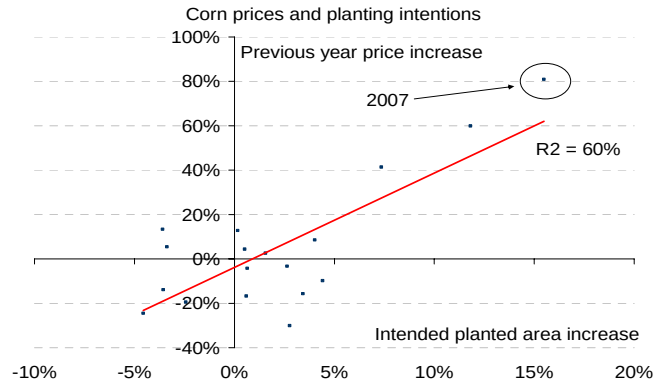
Chart 29: The massive expansion in crop production is unlikely to come from an increase in harvest yields



Source: USDA, Merrill Lynch Commodity Research

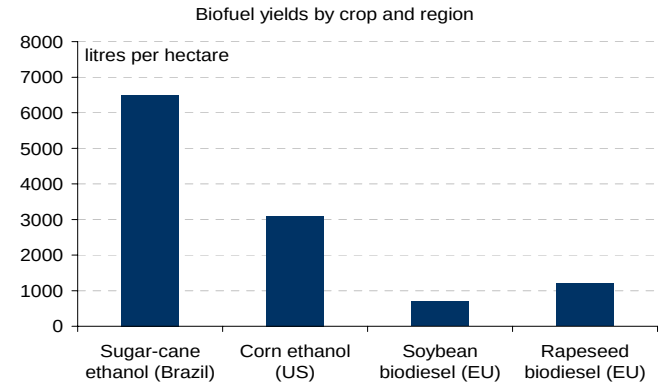
To meet the demand for biofuels production, a massive expansion in feedstock production is required. This expansion is unlikely to come from an increase in harvest yields as they have improved only modestly in the last 20 years—about 1% to 2% yearly increases, on average (Chart 29). The expansion is more likely to come from a direct increase in the planted area for biofuel feedstock, suggesting that farmers will require strong price signals to rotate crops out of non-biofuel into biofuel-linked agricultural commodities (Chart 30). In Europe, available arable land is very scarce and biodiesel is a particularly land-intensive product (Chart 31), suggesting that reliance on foreign grains and oil seeds will increase. Of course, technological innovations like genetic engineering may allow faster improvements on yields than what we have seen historically, but this remains a big unknown at this point.

Chart 30: Farmers are likely to require strong price signals to twist their crops towards biofuels feedstock



Source: USDA, Merrill Lynch Commodity Research

Chart 31: Biodiesel is a particularly land-intensive product when compared with corn or sugar-cane ethanol



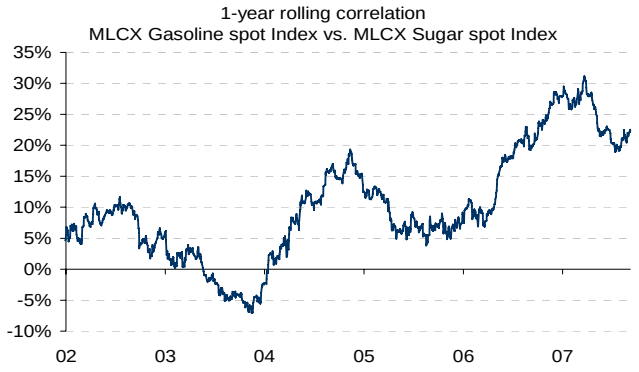
Source: IEA, Merrill Lynch Commodity Research

The correlation between energy and biofuels markets is rising

As the importance of biofuels expands across the world economy, we are starting to see traditionally different markets (e.g. gasoline/corn or gas oil/soybeans) becoming increasingly inter-linked. Sugar and gasoline prices are now being affected by common shocks (Chart 32) and, on our estimates, are now moving

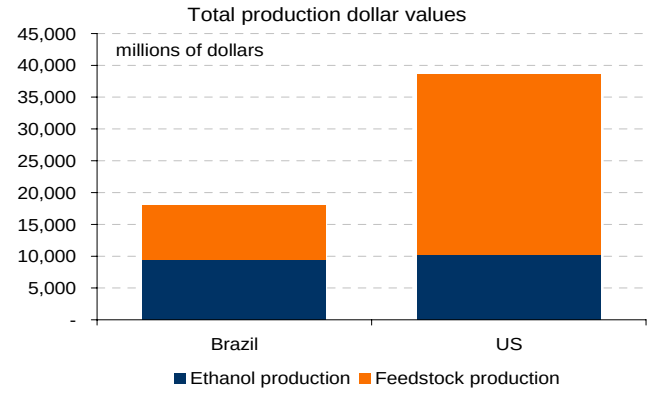
together in tandem over long periods of time[2]. This phenomenon is largely due to the importance of Brazil in the sugar market (20% of global production) as well as in the ethanol market (33% of global production). Brazilian producers can switch between sugar and ethanol production and consumers can switch between ethanol and gasoline consumption relatively easily due to the large share of flex-fuel vehicles in the domestic fleet.

Chart 32: We are starting to see traditionally different markets becoming increasingly inter-linked



Source: Merrill Lynch Commodity Research

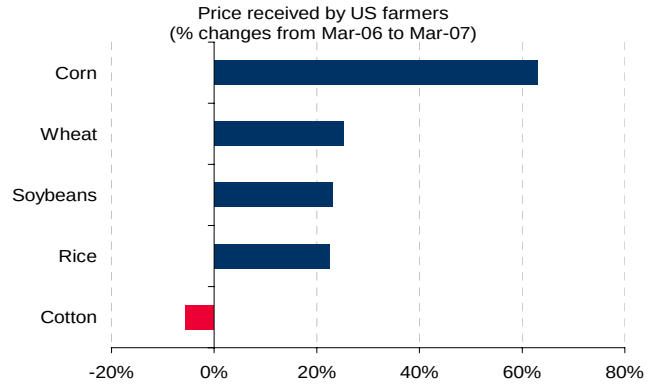
Chart 33: While in Brazil sugar and ethanol are closely linked, the US corn market still dwarfs its ethanol market



Source: IEA, USDA, Merrill Lynch Commodity Research

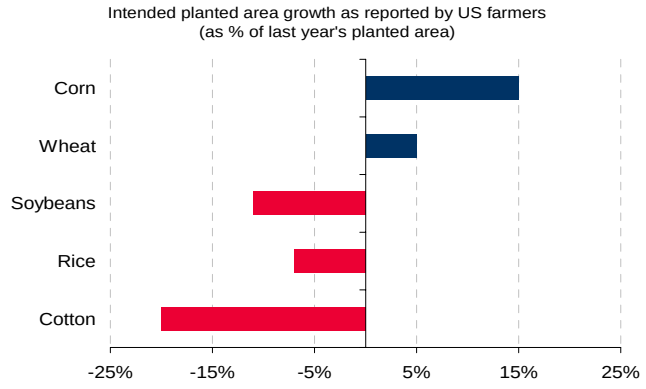
While in Brazil sugar and ethanol are closely linked, the size of the US corn market still dwarfs its ethanol market (Chart 33). As a consequence, the increase in correlation between corn and energy prices has not yet been seen. However, we expect correlation between corn and gasoline, as well as the correlation between oil-seeds and gas oil, to start increasing going forward.

Chart 34: The price received by farmers creates the incentives ...



Source: USDA, Merrill Lynch Commodity Research

Chart 35: ... to move into and out of crops according to their profitability



Source: USDA, Merrill Lynch Commodity Research

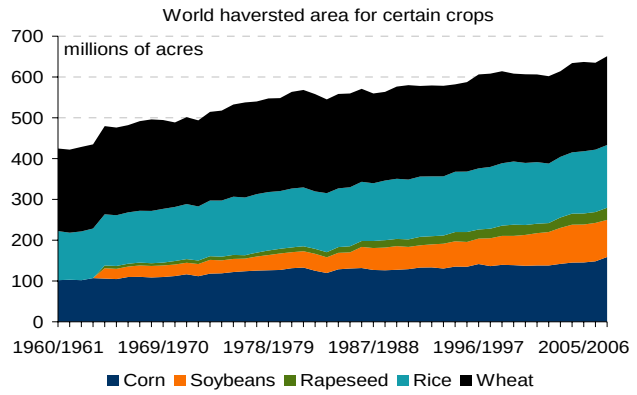
Other agricultural commodity prices are trending higher...

As farmers move into the profitable "biofuels-linked" crops, competition for arable land is starting to affect other crops including wheat, rice, cotton or even coffee (Charts 34 and 35). While the global harvested area for biofuel crops such as

[2] Technically, our analysis suggests that gasoline and sugar prices are co-integrated. This means that even though the time series of gasoline and sugar may be non-stationary, the linear combination of them is stationary.

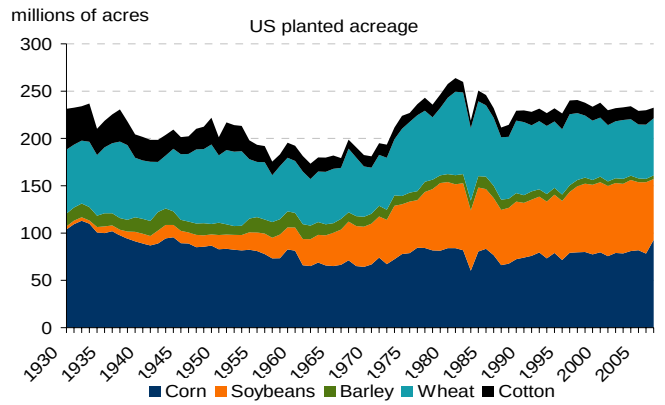
corn, rapeseed and soybeans has increased significantly in the last ten years, the same is not true for wheat, rice and cotton (Chart 36). In the United States, planted acreage has remained steady in the last two decades despite the step-level changes in demand (Chart 37). In our view, the high demand for biofuels feedstock will likely take arable land away from other crops, lending support to prices of agricultural products not directly linked to biofuels such as cotton, rice or even coffee.

Chart 36: The global harvested area for biofuel crops has increased significantly in the last ten years



Source: FAS, USDA, Merrill Lynch Commodity Research

Chart 37: In the United States, planted acreage has remained steady in the last two decades despite the step-level changes in demand

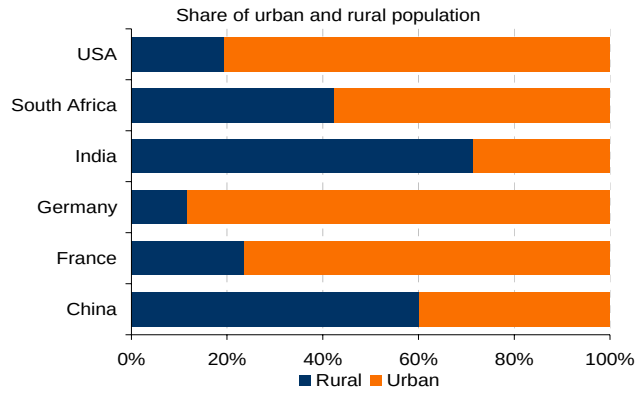


Source: USDA, Merrill Lynch Commodity Research

... driving up the marginal cost of production

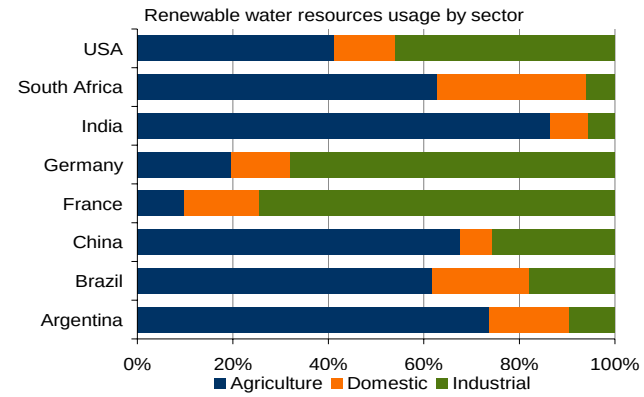
In places like the US and Europe, where arable land availability is limited, production of feedstock crops may need to happen at the expense of others crops such as wheat, rice or cotton. In places with available arable land, like Argentina, Brazil and South Africa, expansions will likely occur in areas that are further away from the major distributions hubs, driving up transportation costs, and in areas with poorer soil quality, resulting in lower yields per acreage. Moreover, urbanization in EM countries like China and India should create heavy pressure on production inputs such as labour, capital and natural resources (Chart 38). In particular, as living standards increase and more complex industrial sectors develop across emerging markets, competition for renewable water resources should increase the costs of land irrigation (Chart 39).

Chart 38: Rapid urbanization in EM countries like China and India could put upward pressure on labour cost inputs



Source: FAO, UN, Merrill Lynch Commodity Research

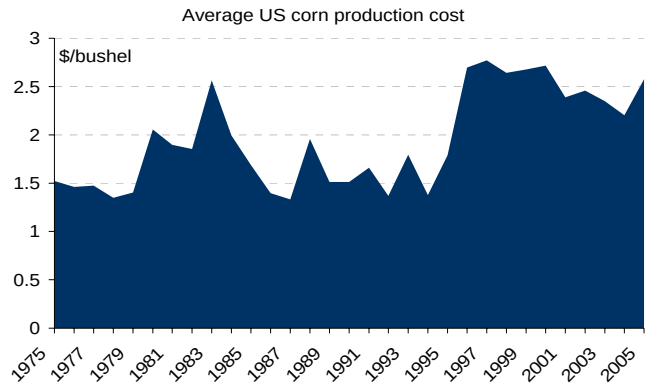
Chart 39: Competition for renewable water resources should increase the costs for irrigation of cultivated land



Source: Source: FAO, UN, Merrill Lynch Commodity Research

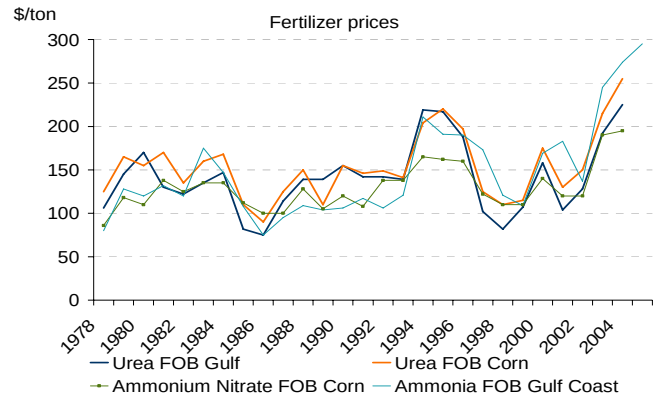
In the more mature economies, the rapid expansion of crops like corn and sugar has pushed agricultural costs up in the last few years (Chart 40). In addition, strong demand and higher energy prices have driven fertilizer prices (Chart 41) as well as other farming inputs higher, also helping to increase production costs. The fierce competition for human as well as natural resources implies that the marginal crop producer will face higher marginal costs of production, ultimately lending support to agricultural commodity prices.

Chart 40: Higher costs of production should give support to feedstock prices



Source: USDA, Merrill Lynch Commodity Research

Chart 41: Fertilizer prices and other farming inputs have been trading up in the recent period, increasing marginal costs of production

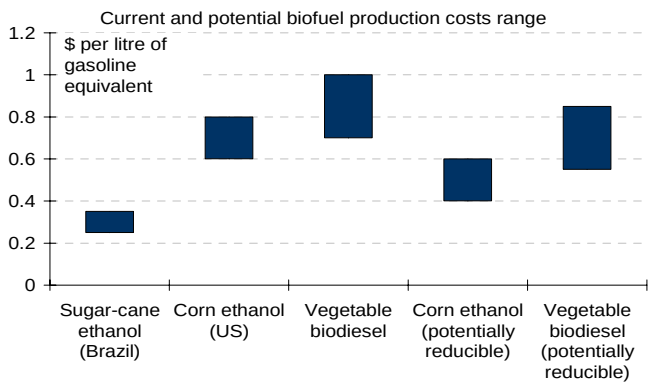


Source: CRB, Merrill Lynch Commodity Research

At the current prices, technology is still not ready to make biofuels widely available

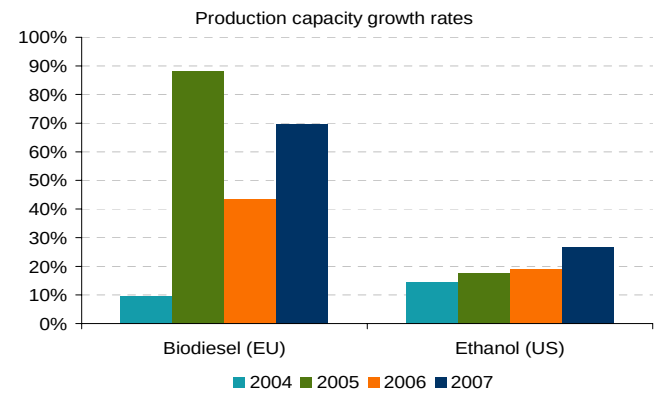
Production costs of biofuels are hard to estimate as they depend on different feedstocks and processes, which vary over time and across regions of the globe. However, the relatively high costs of biofuel production in the OECD countries remain an obstacle to commercial development. The technology currently used in the production of biodiesel from oil-seed crops and ethanol from grains and sugar crops is fairly mature and unlikely to experience any breakthrough that would bring down costs dramatically (Chart 42). Although technology developments for cellulosic ethanol look promising, the potential for cost reductions of other processes is uncertain in the foreseeable future. Without any major breakthrough in technology, expansion will have to happen through the increase in production capacity.

Chart 42: Production technology is unlikely to have costs dramatically reduced in the foreseeable future



Source: IEA estimates, Merrill Lynch Commodity Research

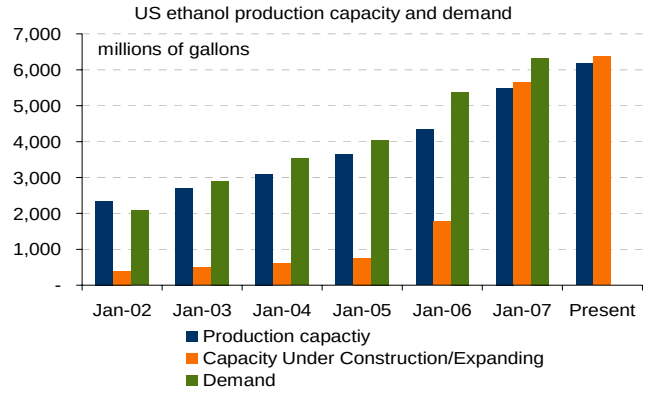
Chart 43: Taking advantage of the government incentives, production capacity has been increasing rapidly in the US and Europe



Source: RFA, EBB, Merrill Lynch Commodity Research

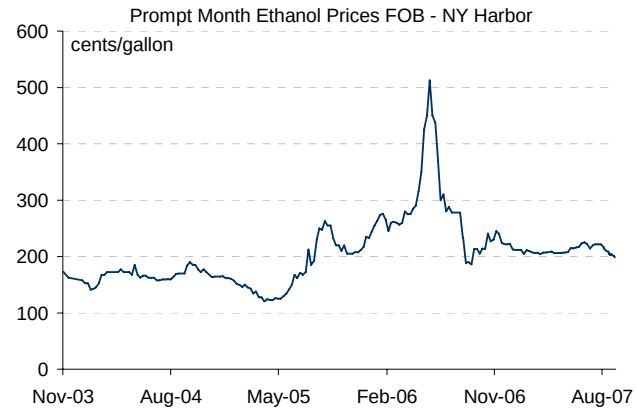
Taking advantage of government incentives, production capacity has been increasing rapidly in the US and in Europe, although the latter is starting from a much lower level of production (Chart 43). In the US, the expansion of the ethanol industry also benefited from the phasing out of MBTE as a gasoline blending component. As a consequence, we are likely to see some excess supply in the US ethanol market this year, with a potentially negative impact on ethanol prices in the short-run (Chart 44). Once the infrastructure for transporting, storing and blending of ethanol is in place, demand for the product is likely to remain firm for some time as substitutability between ethanol and other blending components faces several obstacles.

Chart 44: We are likely to see some excess supply in the US ethanol market this year



Source: RFA, Merrill Lynch Commodity Research

Chart 45: We expect some excess supply in the US ethanol market this year, with potential negative impact on prices in the short-run



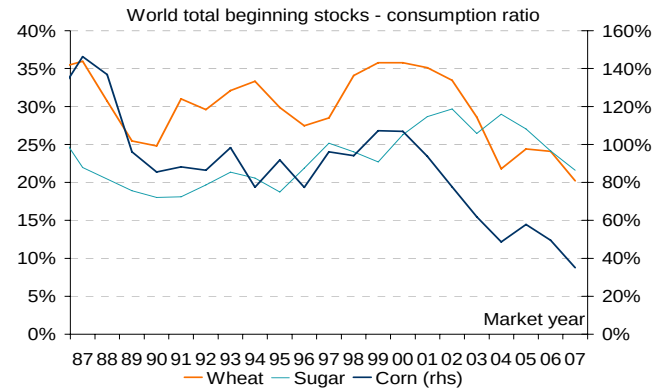
Source: Bloomberg, Reuters, Merrill Lynch Commodity Research

However, on a longer-term perspective, higher prices are needed to encourage the infrastructure build-up required to produce, store and transport biofuels across the world. If biofuels are indeed to fill the supply/demand gap for transportation fuels in the next decade, higher prices will be necessary to create the incentive for a larger and sustainable market (Chart 45).

3. Near-term outlook for biofuel feedstock markets

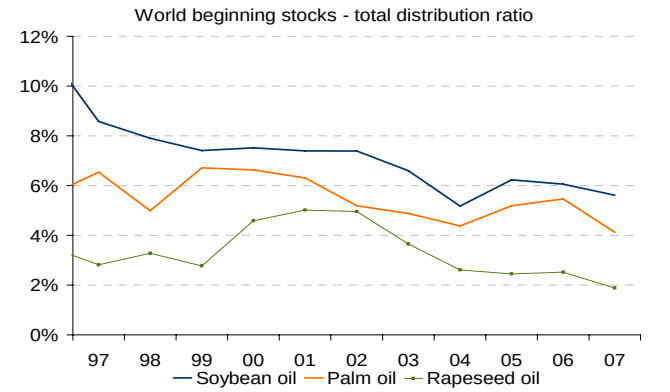
In spite of the uncertain macroeconomic outlook, we remain broadly positive on the agricultural sector on the back of a tight supply/demand balance. On the demand side, strong global economic and population growth is pushing up demand for food while the energy sector is competing to transform various crops into biofuels. On the supply side, water shortages in various parts of the world, limitations to the required increases in arable land, and extreme weather events will all continue to limit agricultural output growth in the coming years. In addition, global grain and oil seed inventories remain at very low historical levels in terms of demand coverage (Chart 46 and 47), lending support to price levels and pushing up commodity price volatility. For some crops such as wheat, limited inventories coupled with a very poor harvest have driven prices to multi-decade highs. In contrast, corn and sugar prices have fallen modestly as bumper crops for these two commodities have resulted in slightly higher inventory levels around the world.

Chart 46: Inventories for key ethanol-linked crops at the beginning of the year stood at very low historical levels



Source: FAS, USDA, Merrill Lynch Commodity Research

Chart 47: Similarly, inventories for crops linked to biodiesel remain very low, lending support to prices

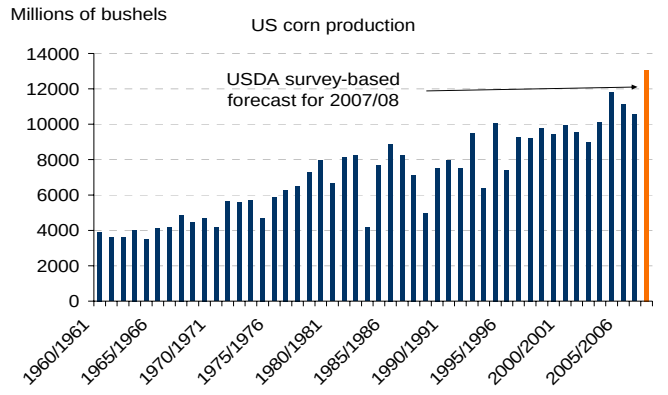


Source: FAS, USDA, Merrill Lynch Commodity Research

Corn outlook: Positive on a 12-month horizon

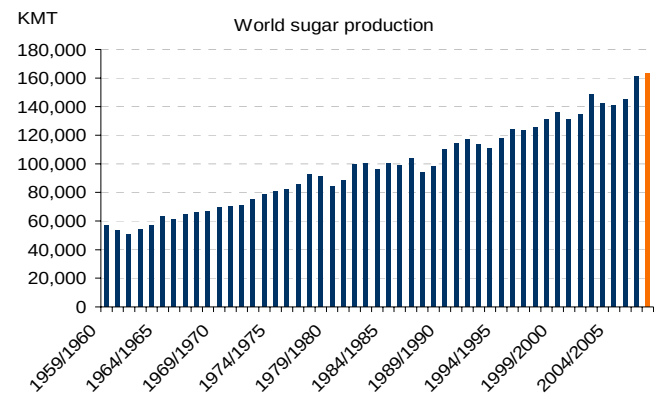
While we remain moderately negative on corn prices in the short-term due to the very large crop in the current harvesting year, we believe that conditions could change very rapidly in 2008. The US corn market, which accounts for almost 40% of the world market, is likely to see an increase of around 20% in the planted and harvested area relative to the 2006/07 market year. The high acreage combined with the excellent crop conditions in the US are resulting in extremely high production levels for this market year (Chart 48). However, the high US production is likely to be largely offset by lower production in Eastern Europe, Argentina and Brazil, and USDA projections for world coarse grains ending stocks for next year is only slightly higher than this year's level. Since front-month corn contracts have come down almost 20% from March this year, when the increase in planting intentions was announced by the USDA, it is likely that most of the downside risks have already been priced in by the market. Thus, after a period of weakness that could last up to 12-18 months, we believe corn prices will strengthen again on the back of the growth in ethanol demand.

Chart 48: If USDA projections are realized corn production may reach record levels in the 07/08 harvest



Source: USDA, Merrill Lynch Commodity Research

Chart 49: The FAS is projecting a record world sugar production for the 2007/08 market year



Source: Bloomberg, Merrill Lynch Commodity Research

Soybeans outlook: Broadly positive from current levels

In our view, soybean prices will likely continue to experience upward pressure in the near future, as we believe that available planting area for soybeans is unlikely to increase much going forward. In part, this year's increase in corn acreage in the United States happened at the expense of soybeans, and we believe this commodity still holds substantial upside. Soybean planted area in the US is facing a 15% decrease relative to the 2006/07 market year. The USDA survey-based production forecasts for the 2007/08 market year show US soybean production down 569 million bushels (or 18%) from last year and world ending stocks are projected to be 20% lower than last year. In our view, these fundamentals lend strong support to long-dated soybean prices. Moreover, the historical roll costs of soybeans investments tend to be much smaller than on other grains such as wheat and corn (Chart 50). As a result, our outlook on soybean investments remains positive.

Sugar outlook: Short-term negative, upside potential in 09

Sugar prices could experience some modest downward pressure in the coming months as more production continues to hit the market. Extremely high sugar price levels last year contributed to a large increase in planting and, ultimately, sugar output. This situation left the sugar market with ending stocks for the 2006/07 market year 33% above the previous year. Farmers responded to high prices by increasing production in 2006 and the market year started with very high levels of world beginning stocks. The FAS is projecting a record world sugar production for the 2007/08 market year (Chart 49), partly driven by a larger than expected increase in the Indian sugar output. The high level of supply certainly puts some downward risks to sugar prices, but on a mid/long-term basis prices will likely be well supported by the increase in ethanol usage. We also believe that sugar prices will keep their correlation with energy prices due to the importance of Brazil in the sugar market (20% of global production) as well as in the ethanol market (33% of global production). More importantly, the marginal cost of sugar production in many Brazilian operations is about 8 to 9 cts/lb, suggesting that the downside from the current price level of 9.30 cts/lb is probably limited. While the near-term outlook is not too encouraging, we believe that sugar prices could potentially experience upside pressure again in 2009, once the market absorbs this year's record harvest.

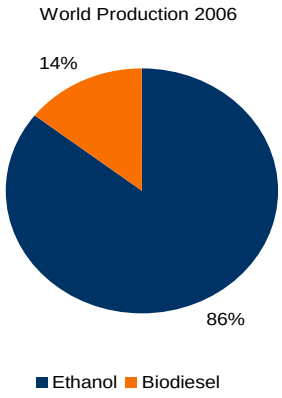
Appendix

A. What are biofuels and where do they come from?

Biofuels are transportation fuels derived from non-fossilized biological sources. Today, there are many processes capable of converting biological feedstock into liquid fuels such as ethanol and biodiesel or into gaseous fuels such as biogas or hydrogen. Grains, sugar-cane and other starches can easily be fermented to produce ethanol. Cellulosic materials can be converted into alcohol or into a variety of gases while oil-seeds can be used to produce methyl-esters to be blended into diesel or burnt as pure biodiesel. Even organic waste can be converted into energy forms which may be used as automotive fuel.

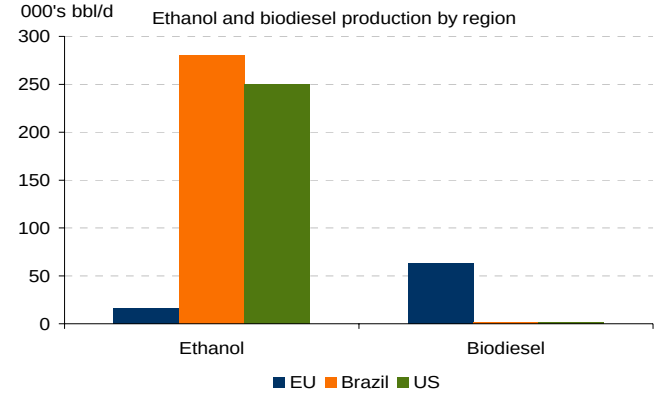
Ethanol is by far the most widely used biofuel for transportation worldwide (Chart 50). While biodiesel is more commonly used as a transportation fuel in Europe, its world production is relatively small compared to ethanol. The US and Brazil are the largest producers of ethanol in the world while most of the world biodiesel production is concentrated in Europe (Chart 51).

Chart 50: Share of global biofuels usage



Source: IEA, Merrill Lynch Commodity Research

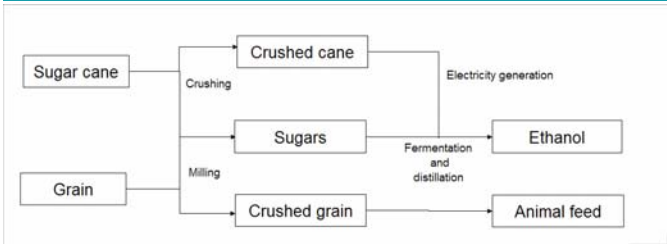
Chart 51: Share of biofuels around the world



Source: EBB, Merrill Lynch Commodity Research

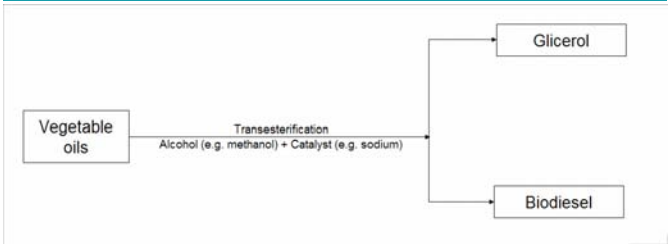
Ethanol is produced from the fermentation of sugars by enzymes and can be produced from any feedstock that can be converted into sugar (Chart 52). Sugar beets and sugar cane for instance contain sugar, which is extracted, fermented and distilled. The crushed sugar cane can also be used for producing power in the manufacturing of ethanol, making the sugar-to-ethanol process one of the most cost-efficient processes available today. Corn, wheat and barley contain starch that can be transformed into sugar and then into ethanol. In grain-to-ethanol processes, only a small percentage of the feedstock mass is actually converted into sugars through a high-temperature enzyme process. In fact, most plant matter cannot be converted easily into sugar and there is currently considerable research devoted to making cellulosic biomass a commercially viable feedstock.

Chart 52: Ethanol process diagram



Source: Merrill Lynch Commodity Research

Chart 53: Biofuel process diagram



Source: Merrill Lynch Commodity Research

The term biodiesel typically refers to fatty acid methyl esters made by the transesterification of feedstock oil or fat (Chart 53). Examples of feedstock commonly used for biodiesel production are soybean oil, rapeseed oil, palm oil and animal fat. The feedstock is treated to have their fatty acids extracted and then mixed with an alcohol and a catalyst. The molecules resulting from this process are broken and reformed into purified esters, which are the final product.

B. Exchanges included in the MLCX Biofuels

Chicago Board of Trade (CBOT)
141 West Jackson Boulevard
Chicago, Illinois 60604-2994,
Tel: +1 (312) 435 3500
http://www.cbot.com/

New York Board of Trade (NYBOT)
World Financial Center,
One North End Avenue, 13th Floor
New York, NY 10282
http://www.nybot.com/

EURONEXT - Paris
Place de la Bourse
75002 Paris
Tel: +33 (0)1 49 27 14 70
http://www.euronext.com/index-2166-EN.html

Winnipeg Commodity Exchange Inc. (WCE)
400 Commodity Exchange Tower
360 Main Street, Winnipeg
Manitoba, Canada R3C 3Z4
Tel: (204) 925-5000
http://www.wce.ca

C. Selection of MLCX Biofuels Commodities

Table 4: Selection of MLCX Biofuels commodities

	Price in $	Volume	Unit	Contract size	Liquidity in $	Result
Soybeans	5.94	31351	soybean bushel	5000	930,797,137	Include
Mini-soybeans	590.60	1089	soybean bushel	1000	643,109,529	Redundant
Sugar #11	0.14	30558	pounds	112000	477,920,231	Include
Corn	2.20	41652	corn bushel	5000	457,172,569	Include
Soybean oil	0.23	7246	pounds	60000	101,172,394	Include
White Sugar	374.10	3517	MT	50	65,781,155	Redundant
Canola	224.78	4320	MT	20	19,422,082	Include
Rapeseed	278.28	454	MT	50	6,317,154	Include
Tokyo Sugar	335.84	336	MT	50	5,639,525	Redundant
Tokyo corn	132.17	147	MT	100	1,938,275	Redundant
Barley	101.24	253	MT	50	1,279,819	Include
non-GMO Soybeans	291.34	364	MT	10	1,060,716	Redundant
American soybeans	274.36	86	MT	20	472,153	Redundant

Source: Merrill Lynch Commodity Research

Note: Price and volume data refer to averages of daily value between Aug-05 to July-06

D. Rolling schedule of MLCX Commodities

Table 5: Rolling schedule of MLCX commodities (contracts rolling out in each month)

Commodity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Corn	H	K	K	N	N	U	U	Z	Z	Z	H	H
Sugar	H	K	K	N	N	V	V	V	H	H	H	H
Soybeans	H	K	K	N	N	X	X	X	X	F	F	H
Soybean oil	H	K	K	N	N	Q	U	Z	Z	Z	F	H
Barley	H	K	K	N	N	V	V	V	Z	Z	H	H
Canola	H	K	K	N	N	X	X	X	X	F	F	H
Rapeseed	G	K	K	Q	Q	Q	Q	X	X	X	G	G

Source: Merrill Lynch Commodity Research

E. MLCX Biofuels calorific energy content weights

Table 6: Biofuels energy content weights

Commodity	Country	Attribute	Value	Price in $/MT	Total Production Value	KBtu per $	Mbtu/MT	Total Energy content (MBtu)	Weights
Soybeans	World	Production (1000 MT)	220556.00	218.18	48121866	45.90	0.21	2208788556	31.12%
Sugar-cane	World	Production (1000 MT)	107504.00	307.86	33096121	65.51	0.21	2168281386	30.55%
Corn	World	FSI Consumption (1000 MT)	226234.00	86.42	19552215	54.60	0.63	1067464099	15.04%
Soybean oil	World	Production (1000 MT)	34530.00	513.01	17714311	45.90	0.09	813084982	11.46%
Canola	North America	Production (1000 MT)	10378.00	224.78	2332733	45.90	0.20	107072184.7	1.51%
Rapeseed	World ex-NA	Production (1000 MT)	38354.00	278.28	10673299	45.90	0.16	489903273	6.90%
Barley	World	FSI Consumption (1000 MT)	43930.00	101.24	4447254	54.60	0.54	242800306.5	3.42%

Source: Merrill Lynch Commodity Research

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