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Who profits from the corn ethanol boom?

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Who profits from the corn ethanol boom?

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The emergence of the ethanol industry has generated substantial profits for individuals involved in ethanol and corn production. However, different sectors of the industry benefit at different times. Outlined below are the beneficiaries and when they benefit. This is shown graphically in Figure 1.

To understand how returns are allocated, it is important to understand the role of prices. The price of ethanol is the major factor determining the total amount of revenue to be divided among the participants in the ethanol industry. The price of corn determines how this revenue is allocated between the ethanol producer and the corn farmer. The cropland cash rental rate (essentially a price) determines how the revenue received by the corn farmer is divided between the farm operator and the land owner.

Another important concept is that profits accrue to the limiting resource in the production chain. This can be seen when we trace how the profits of the ethanol industry have been allocated so far (Figure 1) and how the profits are expected to be allocated in the future.

First Temporary Beneficiary -- Ethanol Producers

During the initial expansion period of ethanol production during 2005 and 2006, large profits accrued to ethanol producers. They benefited from the combination of high ethanol prices and low corn prices. Ethanol prices were high and demand was strong due to the need to supply the oxygenate market vacated by (Methyl Tertiary Butyl Ether) MTBE. At the same time, corn prices were low due to overproduction. The small size of the ethanol production capacity was the limiting resource.

However, ethanol production is a commodity business. It sells a commodity (ethanol) and buys a commodity feedstock (corn). Typically commodity industries expand production capacity until profits are driven to a minimum. The generous profits generated during this period attracted others to the industry in an attempt to also capture generous profits. So more ethanol plants were built and the industry expanded. Production capacity expands until either ethanol is oversupplied and the price is driven down and/or corn shortages emerge and the price of corn increases. Ethanol production capacity is no longer the limiting resource. As shown in Figure 1, this started to occur in late 2006.

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Handbook updates

For those of you subscribing to the handbook, the following updates are included.

Deductible Livestock Costs for Adjusting 2008 Income Tax Returns – B1-15 (1 page)

Monthly Returns from Cattle Feeding – B1-35 (3 pages)

Iowa Farmland Rental Rates (1994-2008) – C2-09 (1 page)

Survey of Iowa Leasing Practices, 2007 – C2-15 (8 pages)

Iowa Farm Building Rental Rate Survey – C2-17 (1 page)

Please add these files to your handbook and remove the out-of-date material.

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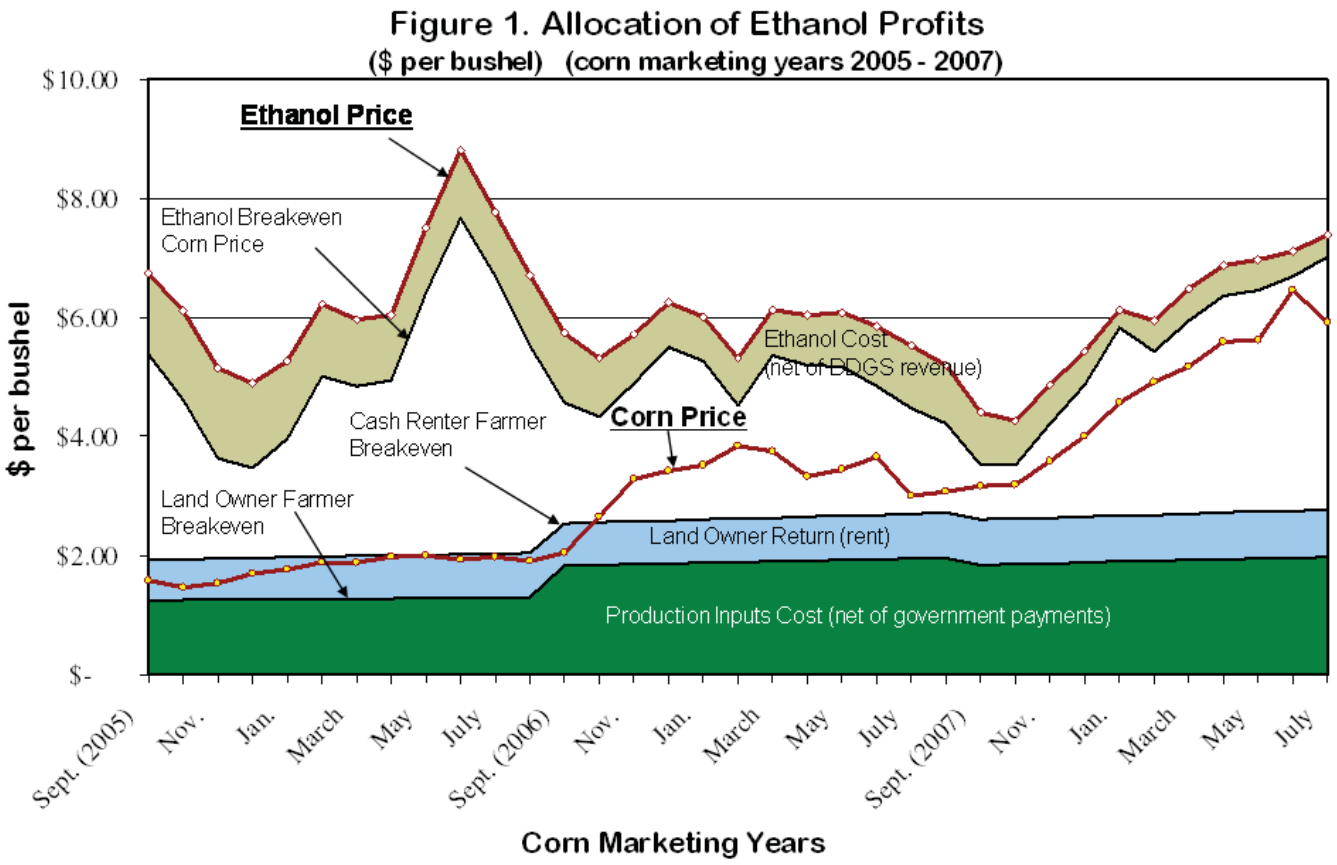

Note: Between 2005 and 2006 the farmer breakeven increased substantially. Although some costs increased during this time period, most of the increase is due to the loss of government payments due to higher corn price.

Figure 1 Explanation

(Everything is expressed as dollars per bushel of corn)

Ethanol Price ($/bu.) -- Ethanol revenue is the ethanol price received by the ethanol producer. However, ethanol revenue is not shown as dollars per gallon of ethanol. Rather, it is shown as dollars per bushel of corn ($ per gal. times 2.8 gal. per bu. equals $ per bu. of corn).

Ethanol Production Costs (net of DDGS revenue) ($/bu.) – This amount includes all ethanol production costs except corn. Because an ethanol facility also produces DDGS (distillers dried grains with soluble), the sale value of the co-product is deduced from the cost to create a net cost. This net cost is subtracted from the Ethanol Price to compute the Ethanol Breakeven Corn Purchase Price (below).

Ethanol Breakeven Corn Purchase Price ($/bu.) – The breakeven purchase price is the maximum price that the ethanol producer can pay for corn and still break even. Paying less (more) than the Breakeven Corn Purchase Price will generate profits (losses) for the ethanol producer (farmer).

Corn Price ($/bu.) – This is the price ethanol producers pay for corn and farmers receive for corn.

Landowner Farmer Corn Price Breakeven ($/bu.) – This is the breakeven corn selling price for farmers who own their land (debt free). Selling for a higher (lower) price than the breakeven generates profits (losses) for the farmer.

Corn Production Input Costs (net of government payments) ($/bu.) -- The amount is computed by adding the cost of production inputs, machinery and labor together and subtracting the government payments received by the farmers.

Renter Farmer Corn Price Breakeven ($/bu.) – This is the breakeven corn price (minimum selling price) for farmers who cash rent their land. Selling for a higher (lower) price than the breakeven generates profits (losses) for the farmer. The breakeven is computed by adding the cost of cash rent to the breakeven for the landowner farmer.

Landowner Return ($/bu.) -- This amount is the cash rent landowners receive who rent their land to tenant farmers.

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Second Temporary Beneficiary -- Corn Producers

As ethanol production capacity expands, the limiting factor in the supply chain changes from ethanol production to corn production. The price of corn (the limiting feedstock) is bid up. As corn price moves upward, ethanol profits are shifted from ethanol producers to farmers. As shown in Figure 1, by mid-2008, almost all of the profits accrue to farmers. However, as farmers expand corn production to take advantage of these generous profits, they begin bidding up the price of production inputs.

Third Temporary Beneficiary – Input Suppliers

As farmers expand corn production, they bid up the price of production inputs such as fertilizer, chemicals, and seed. Higher input prices generate larger input profit margins for agribusinesses. This leads to competition and expanded input production capacity, which over time limits input prices and profit margins. The exceptions are production inputs whose ingredient price increases such as natural gas in the production of nitrogen fertilizer, and inputs with proprietary information like seed companies.

Permanent Beneficiary – Land Owners

Cropland is the eventual limiting resource in the supply chain. All other segments of the supply chain can expand to meet demand. But the amount of corn produced is limited by the number of acres of farmland available for corn production. So, excess profits are bid into rental rates and land values. Over time cash rental rates rise until most of the profits accrue to the land owner. The other segments of the supply chain give up their profits because they expand through competition until they earn only normal profits.

Putting it All Together

Figure 1 shows the allocation of profits from ethanol production from 2005 to the present time.

How do we expect the graph to play out over the coming years? Based on our previous discussion, the price of corn will stay near the breakeven corn purchase price of ethanol producers. Also, the breakeven corn selling price for the cash rent farmer will move up and converge with the price of corn. The increase in breakeven price will come from higher corn production costs. Although a portion of this cost increase will be due to higher input prices (seed, fertilizer, etc.), the primary increase will be due to higher cropland rental rates. Neither the ethanol producer nor the cash rent farmer will continue to receive any excess profits. The major portion of the excess profits will accrue to the land owner in terms of higher cropland cash rental rates. Because the higher cash rental rates increase the return to land ownership, the price of cropland will increase in conjunction with cropland rental rates.

The breakeven corn price for the farmers who own their land will not increase as much. So they will continue to earn excess profits. But these profits accrue from owning land. Not from operating a farm.

If Boom Turns to Bust

The ethanol boom is expected to continue as long as the subsidies, export tax, and mandates stay in place. However, what if critical industry elements change and the price of ethanol falls sharply? For example, an alternative transportation fuel is developed that makes ethanol obsolete. How will this affect the scenarios described above?

Essentially the same scenario will play out, except it will involve losses rather than profits. Ethanol producers are the first segment hit with losses. Many of the facilities will stop production, either temporarily or permanently. This softens the demand for corn and corn prices decline.

Declining corn prices transfer the losses to farmers. With corn prices plummeting below breakeven levels, substantial losses are incurred by farmers. Government price support mechanisms are of little value because, during the ethanol boom, corn breakeven prices moved significantly higher and are above the support mechanisms.

Farmer losses will soften the demand for production inputs and cropland. Production input prices will decline and tighten the margins for suppliers. More importantly, cropland rental rates will be forced down over time. However, these adjustments will not occur immediately. They will occur gradually, imposing substantial losses on farm operators in the meantime.

If Ethanol Busts, But Agriculture Booms

There is another scenario that may occur. A scenario where ethanol production busts but the agriculture sector continues to boom. With this scenario, the demand for traditional uses of corn and other grains increases to take up the slack created by the waning ethanol demand for corn.

A continuation of the rapid economic expansion of China, India, and other parts of the world could precipitate this scenario. As people's incomes increase, they tend to change to a diet with larger amounts of meat. Expanding meat production requires a substantial increase in the supply of feed grains. This would use the corn previously designated for ethanol production. However, as with the first scenario (above) the eventual beneficiary of the boom is the cropland owner.

Conclusion

Due to the rapid emergence of the biofuels industry, the agriculture sector is going through a period of rapid change. How the future of the biofuels industry will evolve is uncertain. Regardless of how it evolves, residual profits or losses will accrue to the limiting resource. The current limiting resource is the amount of cropland. So, residual profits (losses) will accrue to land owners. However, it is not an instantaneous process. During the economic adjustment process, the other players in the supply chain will benefit or lose.