To: Iowa House of Representatives
From: Benjamin Counts, Victoria Glasgow, Evan Parker, Justin Thompson
Date: May 6, 2022
RE: A Kernel of Truth: Ethanol Subsidies vs. Corn Subsidies

Introduction:

This memo explores whether the federal government should drop or modify existing ethanol subsidies according to microeconomic theory. Based on a survey of the literature, analysis of trends over time, and recent supply chain shortages, the authors find that ethanol subsidies are less efficient than direct subsidies given to corn farmers. Direct subsidies, in turn, provide substantial benefits in the form of increased producer surplus. Such a surplus would be especially advantageous to American food exporters looking to enter or enhance their position in international markets.

Main Findings:

- Industrial corn prices have dramatically increased since the start of the coronavirus pandemic.
- Current ethanol subsidies are inefficient at supporting corn farmers due to high instances of deadweight loss, which negatively impacts both consumers and producers.
- A post-pandemic corn subsidy would create a producer surplus that could be channeled into exports, taking advantage of current international market conditions.

Analysis:

Why Corn Prices Have Changed:

From March 2019 through April 2022, industrial corn prices have fluctuated wildly due to a cascade of labor shortages and supply chain breakdowns driven by the coronavirus pandemic. In March 2019, before the pandemic, corn prices were between $3.55 and $3.68 per bushel while in March 2020, at the start of the pandemic, corn prices were between $5.50 and $5.55 per bushel. These prices are substantially lower than current prices, which were between $7.90 and $8.17 per bushel as of April 2022.[1] We contend that this price increase is partly the result of artificially induced market inefficiencies, many of which trace to the Food, Conservation, and Energy Act of 2008's failure to provide renewable energy plans and ethanol grants to corn farmers.[2] These inefficiencies further stem from the subsidies given to ethanol production. The pandemic also exacerbated preexisting weaknesses and inefficiencies by triggering labor shortages and related supply chain breakdowns.

Problems With Current Ethanol/Corn Subsidies:

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[1] Insider Inc. (2022, April 19). *Corn Commodity*. Market Insider. https://markets.businessinsider.com/commodities/corn-price

[2] H.R.2419 - 110th Congress (2007-2008): Food, Conservation, and Energy Act of 2008. (2008, May 22). https://www.congress.gov/bill/110th-congress/house-bill/2419

The current subsidy structure follows a Pigouvian model that unintentionally promotes inefficiencies in the market by incentivizing the production of ethanol from a staple food crop, bringing with it a host of second order costs and effects that include negative incentives to produce food, wasteful uses of agricultural inputs like arable farmland, fertilizer, and water, and *de facto* rent-seeking practices as ethanol producers look to lock in natural monopolies. Perhaps the most egregious of these monopolies is the Archer Daniels Midlands Company (ADM), headquartered in Chicago, Illinois. ADM led lobbying efforts during the Clinton Administration in the 1990s, resulting in a series of regulations that require the use of corn-based ethanol as a fuel-additive. These regulations served to increase ADM's power and profits as a near-monopoly producer of corn-based ethanol.[3]

Other issues with ethanol subsidies are demonstrated in a model created by agricultural economist and academic Bruce Gardner in 2007. Using the current subsidy of $0.51 per gallon of ethanol as a starting point, the authors conclude that in the long run, ethanol subsidies will create 665 million dollars of deadweight loss. Gardner also concludes that a direct corn-based subsidy would create 14 million dollars of deadweight for a subsidy of the same cost. These two subsidies have about a 23.8% difference, calculated as the percentage of the total cost of the subsidy that is lost to inefficiency. As is visible in figure 1, P_y (price of ethanol) goes down, while X_1 (quantity of industrial corn) goes up. P_x (price of corn) goes up while X_2 (quantity of feed and export corn) goes down.

Gardner states that while corn producers, ethanol producers, and the buyers of industrial corn byproducts gain upwards of $3 billion, feed and export corn buyers lose upwards of $1.9 billion. This is why the deadweight loss is so much larger in the ethanol subsidy than in the direct corn subsidy. As seen in figure 2, a deficiency payment (or direct corn subsidy) creates only $37 million in deadweight loss, or 1.4% of the subsidy. While classical economics may tell us that this loss is the result of lingering inefficiencies, such a small deadweight loss is probably the result of an effective subsidy. Moreover, under a direct corn subsidy regime, the price of ethanol will still go down while both industrial and feed/export corn quantities will increase as their price falls.

[3]Pindyck, R. S., & Rubinfeld, D. L. (2018). 10.4: The Social Costs of Monopoly Power. In *Microeconomics* (pp. 368–369). Pearson Education, Inc.

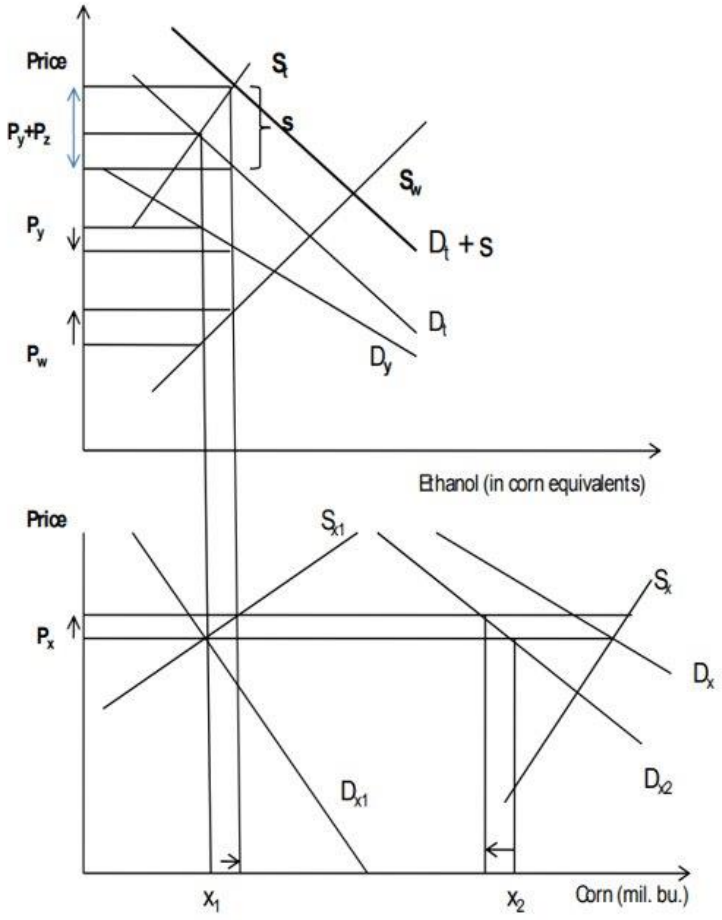

Figure 1: Gardner's model on a $0.51 per gallon ethanol subsidy.[4]

Vision for Post-Pandemic Subsidy:

Table 2. Gains and Losses from Ethanol Subsidy and Deficiency Payments[a]

Policy	Corn Producers	Ethanol Producers	Buyers of Ethanol, By-Products, and Feed Corn	Tax Payers	Sum (Deadweight Loss)
	----------million dollars of annual gains----------				
Ethanol Subsidy (SR)	425	1,588	496	-2,600	-91
Deficiency Payment (SR)	2,017	6	505	-2,600	-18
Ethanol Subsidy (LR)	2,029	875	-969	-2,600	-665
Deficiency Payment (LR)	1,824	34	704	-2,600	-37

[4] Gardner, B. (2007). Fuel Ethanol Subsidies and Farm Price Support. *Journal of Agricultural & Food Industrial Organization*, *5*(2), 2–9. https://doi.org/10.2202/1542-0485.1188

Figure 2: Outcomes from ethanol subsidies and direct corn-based subsidies.[5]

Such a supply increase is likely to be advantageous to Iowa agricultural producers and is certain to be more useful than a direct ethanol subsidy. In particular, the producer surplus resulting from a direct subsidy to corn producers could be leveraged to take advantage of recent market instabilities caused by ongoing geopolitical shakeups, such as expected shortfalls in agricultural production from Ukraine and the Russian Federation, the former of which provided 17% of the world's corn supply before the conflict.[6]

Summary and Closing:

Based on the data and projections, the authors find that subsidizing corn rather than ethanol would directly benefit Iowa farmers and enhance America's position in the global marketplace. Direct corn subsidies will lead to direct farmer benefits such as the long run effect of increased supply and access to new markets. Such benefits will allow the United States to leverage geopolitical shakeups to benefit the American economy with Iowa trailblazing the movement. Through these subsidies, Iowa will serve as the leader in corn-based agriculture for all other states to follow in its example.

References:

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[5]Gardner, B. (2007). Fuel Ethanol Subsidies and Farm Price Support. *Journal of Agricultural & Food Industrial Organization*, *5*(2), 15. https://doi.org/10.2202/1542-0485.1188

[6]Prange, A. (2022, March). Ukraine war increases global food insecurity. Deutsche Welle. Retrieved from https://www.dw.com/en/ukraine-war-increases-global-food-insecurity/a-61206423