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IMPORTANCE OF THE VEETC TO THE U.S. ECONOMY AND THE ETHANOL INDUSTRY

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March 18, 2010

Tax incentives have played a critical role in the development of the ethanol industry in the United States. The primary federal tax incentive for the ethanol industry is the Volumetric Ethanol Excise Tax Credit (VEETC). Created by the American Jobs Creation Act of 2004, the VEETC provides blenders and marketers of fuel with a federal tax credit of 45 cents on each gallon of ethanol blended with gasoline. The VEETC enhances the cost competitiveness of ethanol with gasoline and provides gasoline marketers and blenders an economic incentive to blend ethanol with their gasoline. As such, the VEETC (and the ethanol tax credits that preceded it) has been a major factor behind the spectacular increase in ethanol production and demand over the past two decades.[1]

The market-based objective of the VEETC has been augmented by the Renewable Fuel Standard (RFS), which requires a certain amount of biofuel to be blended into the nation's existing transportation fuel supply. Under the RFS, which was created by the Energy Policy Act of 2005 (EPAct 2005) and expanded by the Energy Independence and Security Act of 2007 (EISA 2007), the use of renewable fuels is mandated to increase from 11.1 billion gallons in 2009 to 36 billion gallons in 2022.

The VEETC expires on December 31, 2010. Critics allege that the VEETC and RFS may be duplicative as demand enhancement programs for ethanol. In other words, some critics question why a market-based incentive (VEETC) would be necessary when a mandate exists requiring the blending of ethanol. This argument masks the real challenge facing policymakers and the ethanol industry, which is how to ensure that an adequate supply of renewable fuels exists to fulfill the demand for those fuels established by the RFS. More specifically:

- Will the domestic ethanol industry remain economically viable and at what scale?
- Where will the ethanol (and other renewable fuels) mandated by the RFS be produced?

[1] The terms "VEETC", "tax credit", and "tax incentive" are used interchangeably in this study.

- Will failure to extend VEETC result in the U.S. exporting the ethanol industry, along with the jobs and economic activity it supports?

The purpose of this study is to analyze the economic importance of the VEETC to U.S. economic growth and job creation, and to detail how VEETC is interrelated to other federal programs designed to promote the use and production of renewable fuels in the United States.

Overview of Federal Incentives for Ethanol

The federal ethanol program has been developed and expanded by Congress with three central objectives in mind: energy security, environmental quality, and domestic economic development. The program combines a blending mandate with federal tax incentives designed to encourage the nation's use and production of ethanol and other biofuels. By expanding the domestic use and production of biofuels, the U.S. will reduce harmful emissions and become less dependent on foreign oil, while at the same time expand the economy and create American jobs from the development of new, low-carbon energy sources. Through the U.S. ethanol program, Congress continues to recognize that:

- Ethanol and other renewable fuels improve our energy security by expanding the supply of domestically produced energy that displaces the need for imports of crude oil and refined products from foreign suppliers.
- Ethanol is a major component of environmental regulations designed to improve and maintain air quality.
- The domestic ethanol and renewable fuels industry provides a steadily growing market for domestically produced agricultural products and is a major engine for economic growth in largely rural communities where the production facilities are located and operate. The ethanol industry provides direct jobs and supports the creation of other new jobs in all areas of the economy that benefit from construction and operation of the ethanol industry. In addition to jobs, the industry generates additional income for households and families in local communities and additional tax revenue for government at all levels.

The major components of the federal ethanol program include:

Tax Incentives

The first federal tax incentive for ethanol was the partial exemption for ethanol from federal excise taxes on motor fuel enacted as part of the Energy Tax Act of 1978. The partial exemption was set at 4 cents per gallon for motor fuels that contained at least 10 percent ethanol (or 40 cents per gallon for every gallon of ethanol). The tax exemption was increased to 60 cents per gallon in 1984. The Omnibus Budget Reconciliation Act of 1990 reduced the rate of exemption to 54 cents per gallon. This level was maintained until it was reduced by the 1998 Transportation Equity Act for the 21st Century. This legislation reduced the exemption to 53 cents per gallon for 2001 and 2002, 52 cents per gallon for 2003 and 2004, and 51 cents per gallon through September 20, 2007. The American Jobs Creation Act of 2004 changed the partial excise tax exemption to an excise tax credit (the Volumetric Ethanol Excise Tax Credit, or VEETC) and extended it through December 31, 2010. The 2008 Farm Bill reduced the VEETC from 51 cents to 45 cents per gallon.

In addition to the VEETC, current law provides for a Small Ethanol Producer Tax Credit (SEPTC). Producers with capacity of no more than 60 million gallons can claim a credit against the producer's income tax liability of 10 cents per gallon of ethanol on the first 15 million gallons of ethanol produced in a tax year. This incentive also expires December 31, 2010. (Reference 26 U.S. Code 40).

Finally, in an effort to facilitate and encourage the growth of second generation biofuels that expand the basket of available feedstocks for biofuel production, such as perennial grasses, crop residues, forestry products, and waste, Congress also established the Cellulosic Biofuel Producer Tax Credit (CBPTC). The CBPTC, which was created under the 2008 Farm Bill, provides producers of ethanol from cellulosic feedstocks with an income tax credit of up to $1.01 for each gallon of cellulosic ethanol it produces. This credit includes, and must be reduced by, the amount of the VEETC and the SEPTC. The CBPTC expires December 31, 2012.

Tariff on Imported Ethanol

In connection with VEETC, a 2.5 percent ad valorem tax and a tariff of 54 cents per gallon is imposed on imports of ethanol from all countries except Caribbean Basin Initiative (CBI) countries. The tariff was originally established by Congress to offset the expected tax benefits received by foreign ethanol producers under VEETC. Because the VEETC is claimed by the purchaser of ethanol and does not distinguish between imported or domestically produced ethanol, without the tariff American tax dollars

would go to support foreign ethanol producers in such countries as Brazil that already provide ample support for their industry.

Under the CBI program, CBI countries may export ethanol to the U.S. duty free provided that the ethanol is produced from a local feedstock or value is added via processing. The CBI exemption is limited to 7 percent of U.S. consumption. Prior to 2006, U.S. imports of ethanol from all countries were generally less than 200 million gallons (USITC). Ethanol imports from all countries totaled 578 million gallons in 2008 (6.1 percent of consumption) as record high oil prices and high domestic ethanol prices made imports attractive even with the tariff. As a consequence of the current lower ethanol prices, imports have fallen and are on track to total about 300 million gallons in 2009.

Renewable Fuel Standard

EPAct 2005 created a Renewable Fuel Standard (RFS) which required that 7.5 billion gallons of renewable fuels be blended with gasoline by 2012. The RFS was expanded under EISA 2007 to require that 36 billion gallons of renewable fuels be used in the nation's motor fuel supply by 2022. EISA caps the use of conventional ethanol produced from corn starch at 15 billion gallons in 2015 and requires the remaining 21 billion gallons to be produced from advanced biofuels including at least 16 billion gallons from cellulosic feedstocks. By way of comparison, an estimated 10.6 billion gallons of ethanol were produced and used in 2009, up from 9.2 billion in 2008 (EIA Petroleum Supply Monthly).

Environmental Standards

The Clean Air Act Amendments of 1990 ("CAA90") mandated increased oxygen content for gasoline to meet ozone and carbon monoxide (CO) standards. In order to meet these requirements, gasoline refiners and blenders had to add an oxygenate to motor gasoline to allow it to burn cleaner and to reduce ozone forming compounds and CO emissions. CAA90 required metropolitan areas not in compliance with CO and ozone standards to use gasoline containing an oxygenate. The CAA90 created a wintertime oxygenate ("oxy-fuel") program and a Reformulated Gasoline Program (RFG) that, at its peak, covered more than 35 percent of all the motor gasoline used in the United States. EPAct 2005 removed the requirement To add an oxygenate to RFG but did not change the requirement to meet and maintain the ozone and CO emission standards of the CAA90.

The two predominate oxygenates used to meet both oxy-fuel and RFG requirements were MTBE (methyl tertiary butyl ether) and ethanol. MTBE is an ether made from methanol produced from natural gas and was the most widely used oxygenate until it was voluntarily removed from the nation's motor fuel supply

by the major gasoline marketers in 2006 due to environmental and financial liability concerns. This provided a significant boost to ethanol demand.

Interaction of the Different Components of the U.S. Ethanol Program

As noted above, the U.S. ethanol program was designed with three objectives in mind: energy security, environmental quality, and domestic economic development. Each of the existing ethanol program components described above work together and individually to help achieve one or more of the objectives of the program.

Why the VEETC is Necessary with an Existing Blending Mandate

Some critics of the U.S. ethanol program argue that an excise tax credit for ethanol is unnecessary when a mandate requiring refiners to blend ethanol into the domestic fuel supply already exists. However, a more detailed evaluation of the program and the underlying goals sought by Congress reveals that the VEETC and RFS are interdependent and complementary programs.

Through the RFS blending mandate, current law requires that an increasing portion of our nation's fuel supply is blended with ethanol. As expanded by Congress under EISA 2007, the volume of ethanol required to be blended will gradually increase from 10.5 billion gallons in 2009 to 31 billion gallons in 2022.[2] By mandating the blending of ethanol, the government is able to ensure the consumption of ethanol in the United States, and thereby achieve the environmental quality and greenhouse gas reduction objectives it originally sought by promoting a low-carbon alternative to petroleum based fuel. However, with the RFS alone, there is no way to ensure that the additional goals of energy security and domestic economic development are met.

Under the provisions of the RFS, there is no requirement that mandated volumes be satisfied with *domestic* ethanol supply. On the contrary, the RFS could be satisfied partly, primarily, or entirely with imported ethanol. And as a result, the United States would simply substitute one type of imported fuel for another. Thus, the trend of high trade deficits driven by increasing expenditures for imported energy would continue.

[2] Under EISA the 2022 renewable fuel mandate consists of 15 billion gallons of conventional ethanol, 16 billion gallons of cellulosic ethanol, and 4 billion gallons of undifferentiated biofuel and one billion gallons of biomass biodiesel.

However, to ensure that the nation also meets the goals of energy security and domestic economic development, the RFS is combined with a market-based tax incentive that assures that U.S. ethanol remains cost competitive for sustained periods despite wide and often rapid price fluctuations in global petroleum prices. By providing a 45 cent credit on each gallon blended, the tax credit provides a safety net to ethanol producers and blenders against wide fluctuations in oil prices and thereby assures ethanol producers and investors that their product will remain cost competitive over sustained periods of time. In this way, VEETC works with the RFS to provide a *demand floor* for renewable fuels. That is, the VEETC helps encourage discretionary blending above and beyond RFS levels in times of high crude oil and gasoline prices. As an example, the 2007 requirement for ethanol blending under RFS1 was 4.7 billion gallons. However, as a result of the VEETC working in concert with the RFS during a period of rising oil prices, 6.49 billion gallons of ethanol were consumed. In the absence of the VEETC, the RFS is an absolute *demand ceiling* that, as discussed later, may not be attainable with domestically produced biofuels. By encouraging and incentivizing production of ethanol in the United States, VEETC's market-based structure ensures that the RFS volume requirements will be filled overwhelmingly with homegrown supply. Absent a market-based incentive, it is highly likely that imports would be used to satisfy the RFS' growing biofuel volume expectations.

Over the five year period of 2004 to 2008, U.S. imports averaged 452 million gallons or 7.7 percent of domestic consumption. Brazil – the world's second-largest ethanol producer – has been the leading exporter to the United States, either directly to U.S. ports or indirectly through the CBI countries. As U.S. production increased in 2009, imports for the first 10 months of 2009 totaled only 245 million gallons, or 2.8 percent of domestic use. Moreover, virtually no ethanol was imported directly from Brazil during 2009. The reasons for this can be attributed to relatively low U.S. ethanol prices compared to Brazilian prices (e.g., average ethanol prices FOB Sao Paulo, Brazil, in December 2009 were $2.55 per gallon compared to $1.93 per gallon FOB Iowa plants).

As discussed below, elimination of the tax credit would greatly reduce U.S. ethanol market prices, deteriorate industry profitability and significantly reduce domestic ethanol production. Removing the tariff would enable foreign producers, such as Brazil, to export directly to the U.S. competitively without having to transship through the CBI countries to avoid the tariff. The combination of removing both the tax credit and tariff would increase export demand for Brazilian ethanol, which would raise domestic ethanol prices in Brazil and stimulate production (Elobeid and Tokgoz 2008). Further, in an examination of a renewable fuel mandate, tax credit and import tariff, de Gorter and Just conclude ethanol exporters (such as Brazil) benefit from and prefer elimination of both the tax credit and tariff when a mandate is binding (de Gorter and Just 2008).

How Does the VEETC Benefit Second Generation Biofuel Producers?

Some organizations are critical of any effort to expand or continue tax incentives directed to the traditional, corn-based ethanol industry. According to these critics, any tax incentives that currently benefit the corn-based ethanol industry should be redirected and targeted to assist the growth and expansion of the second generation ethanol industry, which is expected to represent approximately 60 percent of all ethanol produced in the United States by 2022. However, any effort to characterize the VEETC as a tax incentive directed to the corn-based ethanol industry only fails to recognize the true intent and benefits of this market-based incentive.

Under the VEETC, *all* ethanol is eligible for receiving the 45 cents per gallon excise tax credit, regardless of the feedstock used in the production process (corn, sugar cane, cellulosic or otherwise) or whether the ethanol was produced domestically or imported from a foreign country. By providing marketers and refiners with 45 cents credit for each gallon of ethanol blended into the fuel supply, the tax credit is immediately incorporated into the market price for motor fuel, and serves to make ethanol cost competitive on a sustained basis with petroleum-based fuel. As a result, ethanol blenders are provided an economic incentive to blend and consumers are provided an economic incentive to purchase ethanol given the sustained price differential between ethanol and its petroleum-based alternative.

As indicated earlier, the Cellulosic Biofuel Producer Tax Credit (CBPTC) provides producers of ethanol from cellulosic feedstocks with an income tax credit of up to $1.01 for each gallon of cellulosic ethanol it produces. Since this is an income tax credit, it provides a benefit only to producers who have a tax liability. Most new second generation ethanol producers will likely find this credit of limited use initially because they are unlikely to have significant tax liability, thereby reinforcing the importance of the VEETC. Further, the CBPTC expires December 31, 2012. Failure of the Congress to reauthorize the VEETC will send a negative signal to the investment community and increase the risk of this new technology to lenders.

The tax credit is an ethanol demand enhancement that theoretically raises the market price by the full amount of the credit if oil prices are not affected by increased ethanol production (de Gorter and Just 2008). As such, the tax credit establishes a floor for ethanol prices, not a ceiling. This floor provides an important risk mitigation factor, or safety net, for potential investors needed to provide the capital for the development of new technologies.

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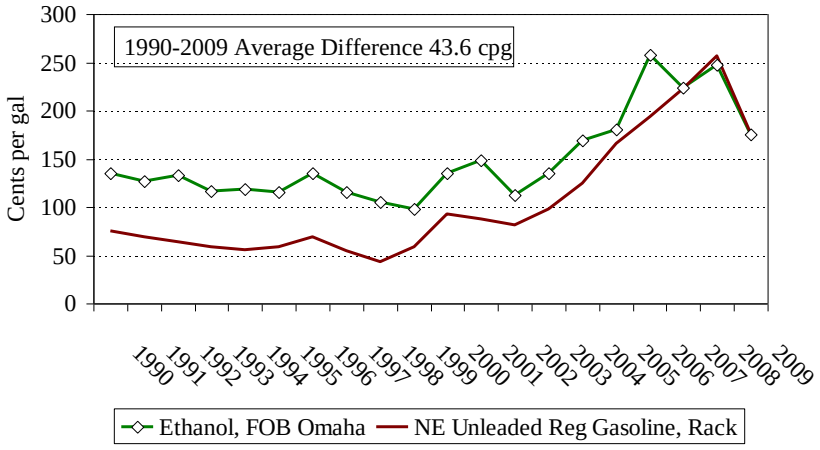
Economic Importance of the VEETC

In the past, ethanol has not been cost competitive with gasoline as a fuel. As shown in Figure 1, Midwest wholesale ethanol prices (FOB Omaha), on average, have been 43.6 cents per gallon higher than wholesale (rack) gasoline prices over the past 20 years. The only time recently that ethanol prices were lower than gasoline prices for a sustained period was during the 2008 commodity price bubble and run up in oil prices.

Since ethanol is sold as an additive to motor gasoline, its price historically has been determined more by oil and gasoline market conditions than by ethanol market conditions (e.g. supply versus demand). This proposition is documented by an econometric analysis of ethanol prices using annual data for the 1990 to 2009 period. This analysis indicates that ethanol prices increased 6.3 percent for every 10 percent increase in crude oil prices, but declined only 1.5 percent for every 10 percent increase in ethanol production.[3] Consequently, ethanol producers have been price takers with their revenue determined largely by developments in the oil and gasoline markets.

Figure 1
Midwest Ethanol and Gasoline Prices



Sources. Nebraska Ethanol Board; Nebraska Energy Office

[3] Ordinary least squares regression on annual data from 2003 to 2009 using the MODLER Statistical Information and Modeling System. The equation is detailed in Appendix I.

Price movements over the past two years suggest that this historical relationship is changing as renewable fuel use expands to meet the RFS mandate and ethanol becomes a larger component of the nation's motor fuel supply.[4] As pointed out in a recent study, "Ethanol rack prices were lower than conventional gasoline rack prices before establishment of the EISA in December 2007". (Kim, Schaible and Daberkow, 2010). The authors further point out that ethanol prices were higher than gasoline during the prime oxygenate months of October 2008 through April 2009, and that the relationship between ethanol and gasoline prices in the future will depend on the evolving relationship between the two products. That is, the blending requirement provided by the RFS now makes ethanol and gasoline substitute goods both in production and consumption. Consequently, the prices of the two products are more likely to vary in response to changes in total fuel supply.

Ethanol has emerged as the second largest component of corn utilization, accounting for 30 percent of total corn use on a gross basis in the 2008/09 marketing year. The growing importance of ethanol as a component of the fuel supply has worked to establish a relationship between oil and corn prices. When combined with concerns over the "blend wall" that may restrict the growth of ethanol use, these factors have strengthened the inter-relationship among ethanol, corn, and gasoline prices over the past two years.[5]

The VEETC is a tax credit claimed by the person who buys ethanol for blending with gasoline. As such, the credit supports demand by reducing the effective cost of ethanol to the purchaser, allowing him to purchase ethanol at an effective price below that charged by the producer. The ultimate amount by which the market price of ethanol will fall if the tax credit is removed depends on the demand and supply elasticities for ethanol. The demand for fuel (gasoline and ethanol) in the U.S. is relatively inelastic (de Gorter and Just 2009) and has become considerably more inelastic than has been the case in previous decades indicating that consumers are less responsive to gasoline price increases than has been the case in the past. (Hughes 2008). The price elasticity of demand for ethanol also is relatively inelastic. Recent estimates put the price elasticity of demand for gasoline between -0.034 and -0.34 and for ethanol in the U.S. at between -0.37 and -0.43 (Elobeid and Tokgoz 2008). The interpretation of this is that, everything

[4] The 7.8 billion gallons of ethanol produced in the U.S. in the first 10 months of 2009 were 7.8 percent of total gasoline demand over the same period. If the RFS mandate is met, by 2022 renewable fuels will account for about 30 percent of motor fuel supply.

[5] The "blend wall" refers to the potential maximum amount of ethanol that can be blended with gasoline under existing EPA regulations. Current EPA regulations limit ethanol to a 10 percent blend for standard vehicles. If U.S. gasoline use totals 130 billion gallons as projected by EIA for 2012 in the 2010 Annual Energy Outlook, the maximum market for ethanol would be 13 billion gallons. The 2012 RFS requirement for conventional biofuel (corn starch ethanol) is 13.2 billion gallons. RFA estimates current operable capacity of 13.1 billion gallons within an additional 1.5 billion gallons under construction. Of the operable capacity, 1.2 billion gallons of capacity idled. The industry has petitioned EPA to allow higher blends of ethanol and a decision is expected by mid-2010.

else held constant, in the short run a 10 percent decline in ethanol price would result in a 4.3 percent increase in demand.

Estimates of the elasticity of supply for ethanol vary more widely and range from 0.37 to 0.75 (Rask, 1988), 0.65 (Elobeid and Tokgoz), and 1.0 to 4.0 (Holland, Knittel and Hughes, 2009). For purposes of this study we averaged the available supply elasticities to arrive at an ethanol supply elasticity of 1.375 meaning that a 10 percent decline in ethanol prices would prompt a 13.8 percent decline in production. In other words, ethanol supply is more elastic than demand and production can be expected to adjust more than demand for a given price change. The decline in ethanol production stemming from the initial fall in ethanol market prices from elimination of the tax credit would, in turn, raise ethanol prices thereby offsetting the full reduction of the tax credit so that the total impact on ethanol prices would be slightly smaller than the full amount of the tax credit.

The potential impact of removing the tax credit on ethanol market prices is illustrated in Table 1. It has been demonstrated (see Figure 1) that VEETC has become embedded in the market price of ethanol, raising the market price of ethanol by as much as the full amount of the credit (de Gorter and Just, 2008). Therefore, for the sake of simplicity, we assume that the initial market price of ethanol declines by as much as the tax credit when VEETC is removed and we apply the elasticities cited above to 2009 data. The average price of ethanol, FOB Iowa plants in 2009 was 164 cents per gallon.[6] Removing the 45 cents per gallon VEETC would reduce the price to producers by 27.4 percent. While this reduction would increase ethanol demand by nearly 12 percent, the lower price would induce producers to cut supply by nearly 38 percent. This reduction in supply would, in turn, raise ethanol prices 4.9 percent so that the net change in ethanol prices from removal of the tax credit would be 37 cents or 22.5 percent.

[6] Average of weekly ethanol prices from USDA Livestock & Grain Market News. National Weekly Ethanol Summary

Table 1

Impact on Ethanol prices of Removing the VEETC 2009

Base Ethanol Price (FOB Iowa Plant, cts/gal)	164.0
Value of VEETC (cts/gal)	-45.0
Net Ethanol Price (cts/gal)	119.0
Percent Change	-27.4%
Ethanol Demand Elasticity	-0.43
Potential Change in Ethanol Demand	11.8%
Ethanol Supply Elasticity	1.375
Potential Change in Ethanol Production	-37.7%
Price Elasticity of Ethanol Supply	-0.1298
Increase in Price from Reduced Production	4.9%
Net Change in Ethanol Price	-22.5%
Ethanol Price after VEETC Removal (cts/gal)	127.0

This result is generally consistent with analysis conducted by FAPRI at the University of Missouri-Columbia (Kruse, Westoff, Meyer & Thompson, 2007). This analysis examined the potential economic impact of not extending the ethanol tax credit using a baseline projection for the 2006 to 2016 period. FAPRI economists found that elimination of the ethanol tax credit (then 51 cents per gallon) would cause wholesale price of ethanol to fall 17.8 percent.

If the VEETC is eliminated, the immediate impact on the industry is expected to be severe. A significant amount of capacity would likely go offline quickly. Some of that capacity may come back online as prices rebounded to an equilibrium point, but most of the lost production would not come back. For example, as indicated earlier, an estimated 1.2 billion gallons of ethanol capacity already has been idled largely as a consequence of the adverse economic environment of the last two years. Failure to extend the VEETC would significantly increase the possibility that currently idled capacity would not be brought back on line, thereby resulting in additional loss for the economy.

Economic Impact of Removing the VEETC

Eliminating the VEETC would result in lost jobs, lower GDP and household income, and reduced tax revenue at all levels

The ethanol industry is an integral part of a manufacturing sector that makes a significant contribution to the American economy and adds substantial value to agricultural commodities produced by American farmers. Expenditures by the ethanol industry for feedstocks (grain) and other raw materials, other goods, and services represent the purchase of output of other industries. The spending for these purchases circulate through the local and national economy generating additional value-added output, jobs in all sectors of the economy, household income, and tax revenue for government at all levels.

As indicated in Table 1, removal of the VEETC is likely to result in a reduction of as much as 37.7 percent in U.S. ethanol production. Using an estimated operating capacity base of 13.1 billion gallons and production of 10.6 billion gallons for 2009 this would represent a loss of exactly 4 billion gallons, or the equivalent of the annual production from more than 60 average-sized ethanol plants.[7]. This means that the ethanol industry would spend $6.6 billion less on purchases of grain and other raw materials, good and services needed to produce four billion gallons of ethanol on an annual basis.[8]

The loss to the economy of a 4 billion gallon reduction in ethanol production can be estimated by applying the appropriate final demand multipliers for value added output, earnings, and employment for the relevant supplying industry calculated by the U.S. Bureau of Economic Analysis (BEA) to the reduction in industry expenditures described above.[9] This analysis indicates that removal of the VEETC would:

- Reduce aggregate GDP by $16.9 billion (2009 dollars).
- Result in the loss of more than 112,000 jobs in all sectors of the economy. These jobs include those directly involved in ethanol production as well as all other jobs supported by the impact of the dollars spent by ethanol producers as they circulate throughout all sectors of the economy.
- Reduce household income by $4.2 billion (2009 dollars)
- Cut State and local tax revenue by $2.7 billion and Federal tax revenue by $2.4 billion.

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[7] According to RFA, 201 currently operable ethanol plants have a total capacity of 13.14 billion gallons, for an average plant capacity of 65 million gallons.

[8] The $6.6 billion expenditure on goods and services is at 2009 prices. More than half of this is accounted for by purchases of corn. In the short run (e.g. first year), the loss would be reduced because the corn would already have been produced. However, reduced demand for corn of 1.4 billion bushels would reduce corn prices and presumably lower production in subsequent years resulting in an economic loss from lower corn output.

[9] The multipliers used in this analysis are the detailed industry RIMS II multipliers for the United States estimated by the Bureau of Economic Analysis, U.S. Department of Commerce.

It is important to note that this economic loss will be disproportionately felt by largely rural communities where ethanol plants are located and supply the grain, utilities, labor and other services needed to produce ethanol.

Removal of the VEETC would deteriorate the nation's energy security

Since the RFS mandates the *use* of renewable fuels (not the *production*), removal of the VEETC would likely result in the replacement of domestic ethanol production with imported ethanol. This means that instead of reducing dependence on imported energy, the U.S. will be increasing dependence for a different fuel from different supplying countries.

The U.S. tax credit is accompanied by an import tariff that essentially prevents taxpayer dollars from being paid to foreign producers. If the VEETC is removed, we expect the import tariff also would be eliminated. This would provide a significant incentive for foreign ethanol producers such as Brazil, India, and China to increase exports to the United States. As pointed out by de Gorter and Just (2008), in the presence of a mandate such as provided by the RFS, exporters like Brazil would prefer the elimination of both the tax credit and import tariff. Consequently, we would expect the decline in U.S. production that would be tied to VEETC removal to largely be replaced by imports.

Elimination of both the VEETC and tariff also will have an unintended adverse impact on CBI countries that currently are exempt from the tariff as long as they produce ethanol from domestic feedstocks or add value to ethanol imported from countries like Brazil. Over the past several decades, many CBI countries have made substantial investment in dehydration plants that process hydrous ethanol produced in Brazil for tariff-free export to the U.S. This activity supports employment and generates important export earnings for these countries. Removal of the tariff would reduce or eliminate the benefit of processing ethanol for re-export.

If foreign ethanol producers were unable to ramp up production and exports to offset lost U.S. ethanol production resulting from VEETC removal, the RFS blending targets would be in jeopardy of not being satisfied and an increasing share of motor fuel demand would be satisfied by imported oil or finished fuels. This scenario seems least likely, but is certainly plausible.

In short, removing the tax credit would encourage the exportation of another U.S. industry and result in the loss of the economic benefits provided by the ethanol industry in terms of direct and indirect jobs, output, income, and tax revenue for the Federal treasury and State and local governments.

Eliminating the VEETC would have a chilling impact on the development of second generation biofuels

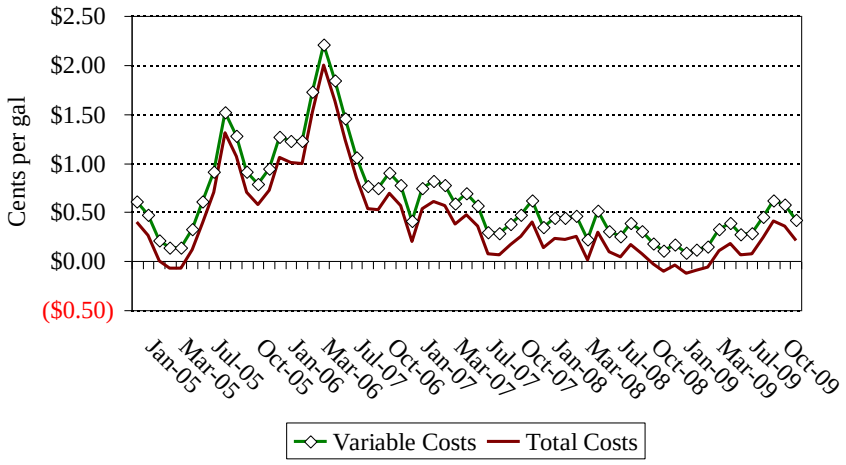
Failure to reauthorize the VEETC will send an unintended message to the investment community that the United States is not serious about supporting the development and growth of the biofuels industry. Under current law, producers of cellulosic biofuels can qualify for a $1.01 per gallon federal tax credit. This tax credit is only useful by firms involved in cellulose biofuel production to the extent that they have a tax liability. Considering the early stage of commercialization of cellulosic conversion technology, it is likely that most firms will find the cellulosic tax credit to be of limited usefulness, thereby reducing the effectiveness of the incentive.

Also, removal of the VEETC would likely raise questions among investors about the potential longevity of the cellulosic tax credit, thereby increasing risk for lenders and investors. This increased risk is likely to impede the vital flow of capital for investment and development of this component of the biofuels industry. Development of the cellulosic biofuel industry is vital to achieving the 36 billion gallon target for renewable fuel use by 2022. Failure to develop this industry will increase demand for biofuel or oil imports and further erode U.S. energy security.

Impact of Removing the VEETC on Industry Profitability

Lower wholesale prices for ethanol resulting from removal of the ethanol tax credit would significantly reduce revenue for ethanol producers (assuming no change in production costs). Producers who could not cover variable costs would be expected to reduce output or cease production. The major factors that determine profitability for ethanol producers are the price they receive for ethanol and the cost of production. According to ethanol profitability worksheets for a representative 100 million gallon capacity dry mill ethanol plant prepared by Iowa State economists (Hofstrand), feedstocks (corn) account for nearly 70 percent of variable production costs. As shown in Figure 2, ethanol profitability has been widely variable in recent years. A combination of high ethanol prices and low corn prices in 2006 led to exceptional profitability in the ethanol industry. This was a major factor behind the 40 percent increase in the number of operating ethanol plants and 58 percent increase in ethanol production between 2005 and 2008.

Figure 2
Net Returns for Iowa Ethanol Production



Sources. Ethanol Profitability Spreadsheet. Agricultural Marketing Resource Center Iowa State University Extension.

Sharply increasing corn prices in 2007 and 2008, caused in large part by a global commodity price bubble led by crude oil, caused returns over variable costs to evaporate (and returns over total costs to turn negative) by late 2008. This decline in ethanol profitability was a major reason for the bankruptcy of a major producer, VeraSun Energy, and several smaller firms. According to the Renewable Fuels Association, 23 ethanol plants representing nearly 1.8 billion gallons of capacity closed during 2008. Improved margins in the latter half of 2009 attracted new industry participants (notably the oil refiner and marketer Valero Energy) who acquired and reopened several closed facilities. At the end of 2009, an estimated 1.2 billion gallons of ethanol capacity remain idle.

Removing the ethanol tax credit would reduce wholesale ethanol prices, producer revenue, and seriously damage profitability. The potential impact of removing the ethanol tax credit on producer net returns can be illustrated applying the estimated price effects described above to the costs and returns for 2009 calculated by Iowa State. This is illustrated in Table 2.

Panel A of Table 2 displays the key components of the net returns over variable costs a representative 100 MGY Iowa dry mill ethanol by month for 2009. Total revenue is the sum of the price the producer receives for ethanol plus the revenue from marketing the co-product, distillers dried grains (DDG). As indicated earlier, the major cost for the ethanol producer is for feedstocks (corn). Returns over variable

costs were positive for each month of the year and are estimated to average 30 cents per gallon returns for 2009. By way of comparison, returns for the previous four years averaged 72 cents per gallon.

As calculated earlier, removal of the 45 cents per gallon tax credit is expected to reduce wholesale ethanol prices (and the revenue from marketing ethanol) by 22.5 percent. As discussed earlier, elimination of the tax credit also will reduce ethanol production and the demand for corn. Since ethanol accounts for about 30 percent of total corn utilization, a decline in ethanol production can be expected to result in a reduction in corn prices which would offset some of the decline in revenue. Using the 2007 FAPRI and 2008 Elobeid and Tokgoz analyses as a guide, we estimate that a 37.7 percent decline in ethanol production would result in an 8 percent decline in corn prices. Reduced production of DDG from lower corn use for ethanol would raise DDG prices an estimated 3.6 percent.

Table 2

Iowa Ethanol Returns over Variable Costs

A. Current Returns over Variable Costs

	Price Corn per bushel	Rev/gal Ethanol With VEETC	Rev/gal DDGS	Rev/gal Total	Cost/gal Feedstock Corn	Cost/gal Other Var.	Cost/gal Total Var.	Net Return Over Variable Costs
Jan-09	$3.67	$1.52	$0.40	$1.92	$1.31	$0.50	$1.81	$0.11
Feb-09	$3.45	$1.49	$0.40	$1.89	$1.23	$0.48	$1.72	$0.17
Mar-09	$3.62	$1.46	$0.39	$1.85	$1.29	$0.47	$1.76	$0.09
Apr-09	$3.76	$1.50	$0.39	$1.88	$1.34	$0.42	$1.76	$0.12
May-09	$3.98	$1.56	$0.41	$1.97	$1.42	$0.40	$1.82	$0.15
Jun-09	$3.91	$1.67	$0.44	$2.11	$1.40	$0.39	$1.79	$0.33
Jul-09	$3.08	$1.59	$0.29	$1.88	$1.10	$0.39	$1.49	$0.39
Aug-09	$3.14	$1.53	$0.25	$1.79	$1.12	$0.39	$1.52	$0.27
Sep-09	$3.15	$1.54	$0.26	$1.80	$1.12	$0.39	$1.52	$0.28
Oct-09	$3.61	$1.80	$0.34	$2.14	$1.29	$0.40	$1.69	$0.45
Nov-09	$3.65	$1.98	$0.38	$2.36	$1.30	$0.44	$1.74	$0.62
Dec-09	$3.65	$1.96	$0.36	$2.32	$1.31	$0.44	$1.75	$0.57
Average	$3.56	$1.63	$0.36	$1.99	$1.27	$0.43	$1.70	$0.30

Source: Ag Decision Maker, D1-10 Ethanol Profitability. AgMRC Renewable Energy Newsletter, February 2010. Iowa State University.

B. Returns over Variable Costs Without Tax Credit

	Price Corn per bushel	Rev/gal Ethanol Without VEETC	Rev/gal DDGS	Rev/gal Total	Cost/gal Feedstock Corn	Cost/gal Other Var.	Cost/gal Total Var.	Net Return Over Variable Costs
Jan-09	$3.37	$1.18	$0.42	$1.59	$1.21	$0.50	$1.70	($0.11)
Feb-09	$3.18	$1.15	$0.41	$1.57	$1.14	$0.48	$1.62	($0.05)
Mar-09	$3.33	$1.13	$0.40	$1.54	$1.19	$0.47	$1.66	($0.12)
Apr-09	$3.46	$1.16	$0.40	$1.56	$1.23	$0.42	$1.65	($0.09)
May-09	$3.66	$1.21	$0.43	$1.64	$1.31	$0.40	$1.71	($0.07)
Jun-09	$3.60	$1.30	$0.46	$1.75	$1.29	$0.39	$1.68	$0.08
Jul-09	$2.83	$1.23	$0.30	$1.53	$1.01	$0.39	$1.40	$0.13
Aug-09	$2.89	$1.19	$0.26	$1.45	$1.03	$0.39	$1.43	$0.02
Sep-09	$2.89	$1.19	$0.27	$1.46	$1.03	$0.39	$1.43	$0.04
Oct-09	$3.32	$1.39	$0.35	$1.74	$1.19	$0.40	$1.59	$0.16
Nov-09	$3.36	$1.54	$0.39	$1.93	$1.20	$0.44	$1.64	$0.29
Dec-09	$3.36	$1.52	$0.37	$1.89	$1.20	$0.44	$1.64	$0.25
Average	$3.27	$1.26	$0.37	$1.64	$1.17	$0.43	$1.59	$0.04
% Change	-8.0%	-23.0%	3.6%	-17.8%	-8.0%	--	-6.0%	-85.3%

These impacts are estimated on monthly returns in Panel B of Table 1. Removal of the tax credit would reduce wholesale ethanol prices (revenue from ethanol) by 22.5 percent, however modestly higher DDG prices would result in an aggregate 17.8 percent drop in revenue. Corn prices are expected to fall 8 percent; however since other variable costs are unaffected by removal of the tax credit, total variable costs are 6 percent lower than would be the case with the tax credit in place. As a consequence of these impacts, net returns over variable costs would have been negative for five months of the year and producers would have experienced an 85 percent reduction in net returns for the entire year.

A decline in profitability of this magnitude can be expected to force marginal producers to either cut operations or cease production. Given the experience of 2008 and early 2009 regarding bankruptcies and idled capacity in the ethanol industry the 37.7 percent reduction in ethanol output presented in Table 1 does not appear unreasonable.

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Conclusion

The ethanol tax credit has played a vital role in the expansion of the U.S. ethanol industry. Removal of the tax credit would ultimately reduce the market price of ethanol and seriously affect the profitability of producing ethanol in the United States. In the absence of the tax credit, many ethanol producers would be forced to cease production and other producers may cut output. Ethanol industry bankruptcies likely would again increase and jobs and other economic benefits to largely rural communities would be lost. Domestic production would be replaced by ethanol imports to the extent possible, thereby further increasing U.S. energy dependency on foreign supplies and jeopardizing U.S. energy security.

Ironically, the ultimate beneficiary of removing the ethanol tax credit would not be American consumers, but rather foreign ethanol producers in nations like Brazil and China.

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Appendix I

The relationship between wholesale ethanol prices, ethanol production capacity and oil prices used in Table 1 was estimated using an ordinary least squares regression equation on annual data over the period 1990 to 2009. The specification, summary statistics, and data for the equation are shown below.

Sample Period: 1990-2009
Number of Observations: 20
Ordinary Least Squares
Autoregressive Corrections: Hildreth-Lu Technique

ETOHPRNE=C1*ETOHJAN1CAP+C2*OILRAC+C3

Where:

ETOHPRNE Ethanol price, FOB Omaha (cents per gallon)
ETOHJAN1CAP Beginning Ethanol Capacity (million gallons)
OILRAC Refiners acquisition cost of oil ($ per bbl)

Parameter	T-Statistic	Std Error	Mean	Elasticity
C1)-0.00007	-2.42263	0.00003	2876.785	-0.1298
C2) 0.02632	8.71288	0.00302	32.457	0.5731
C3) 0.82764	14.87280	0.05565	1.000	0.5552

Variance=	0.029261	Dependent Mean=	1.491
Standard Error=	0.171059	Percent Error=	11.47%
Explained SS =	33.9776	UnCntrd R-Square=	0.9941
R-Square=	0.8855	R-Bar-Square=	0.8641
Max LLF=	9.1176	F-Statistic: F(3,16)=	41.2618

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Data Used in the Regression Analysis

	Wholesale Ethanol Price FOB Omaha	Jan 1 Ethanol Capacity	Refiners Acquisition Cost of Oil
	ETOHPRNE	ETOHJAN1CAP	OILRAC
	(cpg)	(Mil gal)	($/bbl)
1990	1.350	1,021.3	$22.22
1991	1.270	1,113.2	$19.06
1992	1.330	1,131.3	$18.43
1993	1.160	1,171.1	$16.41
1994	1.190	1,276.5	$15.59
1995	1.150	1,516.5	$17.23
1996	1.350	1,541.4	$20.71
1997	1.150	1,600.1	$19.04
1998	1.050	1,697.5	$12.52
1999	0.980	1,717.0	$17.51
2000	1.350	1,748.7	$28.26
2001	1.480	1,921.9	$22.95
2002	1.120	2,347.3	$24.10
2003	1.350	2,706.8	$28.53
2004	1.690	3,100.8	$36.98
2005	1.800	3,643.7	$50.24
2006	2.580	4,336.4	$60.24
2007	2.240	5,493.4	$67.94
2008	2.470	7,525.4	$94.74
2009	1.790	10,925.4	$56.44

Sources:

Ethanol: Nebraska Ethanol Board
Ethanol Capacity: BBI International, RFA

Oil Price: EIA