

Policy, Trade and Midwest Biofuels: An Importer Perspective

“Biofuels in the Midwest: A Discussion”

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Government policy drives biofuels economics

- **Government aids biofuels on both the demand side and the supply side.**
- **Demand side relies on Federal policies**
 - **Blender tax credit and state user subsidies**
 - **Import duty on imported ethanol**
 - **Mandates**
 - **Environmental, clean air and perhaps GHG regulations**
- **California environmental policies mandate ethanol use and may encourage more use of biofuels**
- **Supply-side subsidy for corn is in the Farm Bill.**
- **Supply subsidy for ethanol is in the Farm Bill, energy bill and state programs.**

Biofuels Mandates and Tax Credit

- The ethanol supply has exceeded federal mandates so these have not been binding
- The 2007 Energy Act mandates have not yet exceeded projected production from plants nearing production, thus the demand mandates may still not bind through 2012.

Conventional ethanol

2008	9.0 billion gallons
2009	10.5 bil. gal.
2010	12.0 bil. gal.
2011	12.6 bil. gal.
2012	13.2 bil. gal. To a max of 15 million gallons in 2015

- Depending on corn and oil prices, mandates may push capacity growth in ethanol plants in the later years and keep pressure on the price of corn, least by 2015.
- Blenders tax credit dropped from \$0.51 to \$0.45 per gallon in the 2008 Farm Bill.

Ethanol Import Policy

- One rationale for the tax credit and mandates for ethanol is that ethanol consumption avoids negative externalities in term of reduced oil imports from unstable or hostile places (Middle East or Venezuela).
- This demand side may benefit suggest using ethanol rather than oil, but is neutral relative to ethanol imports versus domestic production
- The ethanol claim to be environmentally friendly has eroded substantially over the past few years
- So the military, political and economic stability arguments are the remaining public policy rationale
- But, ethanol has a 2.5% ad valorem tariff plus a \$0.54/gallon specific additional duty. (Except in limited quantities from CBI countries.)
- Nonetheless foreign producers (Brazil) produce at such lower costs that ethanol continues to enter over the tariff

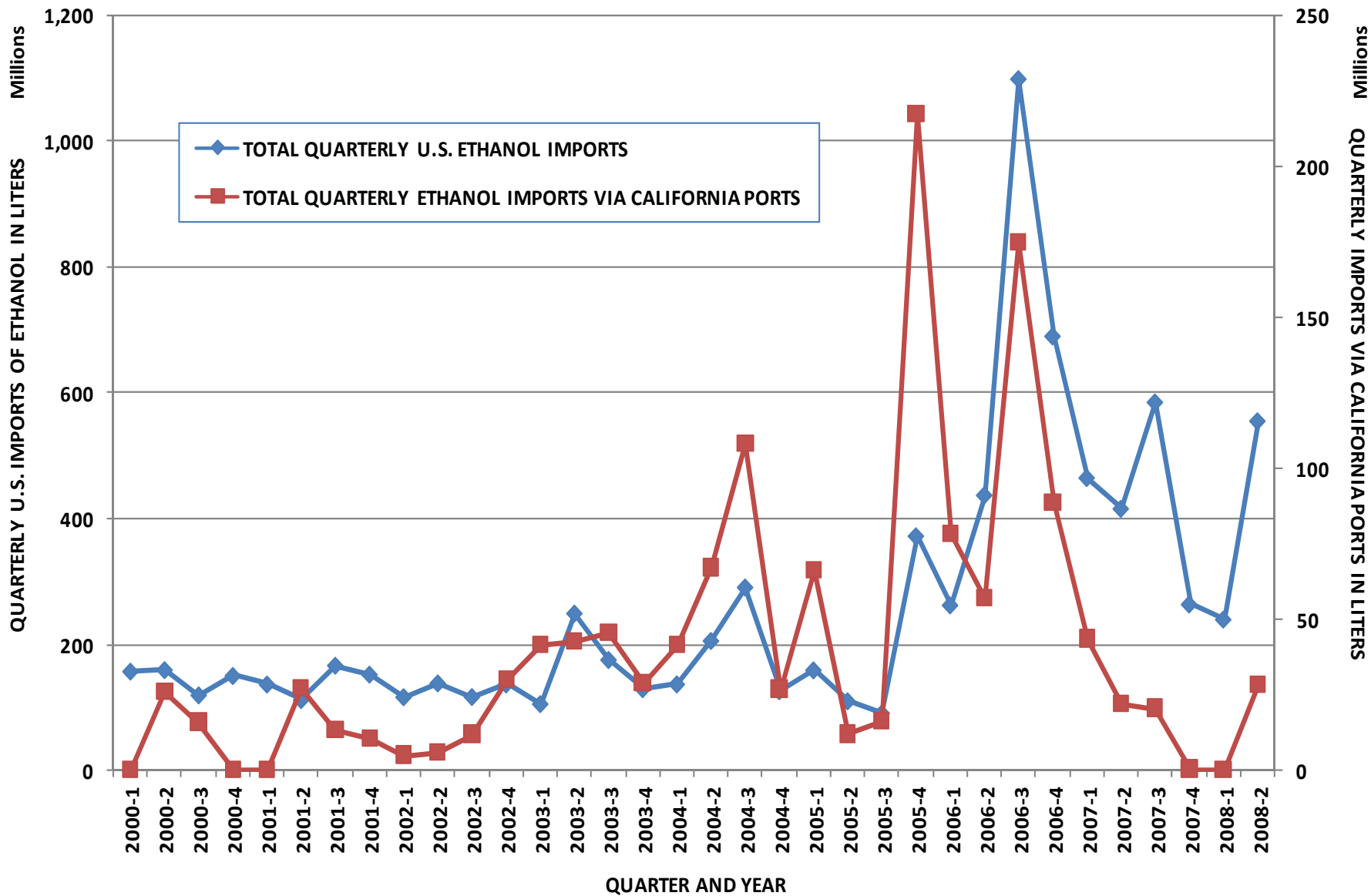
Caribbean Basis Initiative (a footnote)

- **Duty free access for Caribbean products, including ethanol**
- **Local content rules preclude simple transshipment**
 - **50% local feedstock, or**
 - **limited access to 7% of U.S. market (TRQ)**
- **CBI has high cost sugar and high ethanol processing costs**
- **Hydrous ethanol shipped from Brazil is dehydrated (to meet domestic content rules of the CBI) and then shipped to the U.S.**
- **But, more ethanol comes directly from Brazil than through the CBI countries, which amounts to far less than the 7% limit, the CBI constraints are not binding**
- **For most shipments, paying the duty is cheaper than going through the CBI countries.**
- **Some direct imports have had a duty draw back, which ends October 2008 (data is unclear about the share of imports affected).**

Ethanol Import Patterns

- Explore imports over the past 8 years as ethanol consumption has grown
- Despite substantial duties, imports have grown as ethanol economics has changed
- Also, variable from month to month and volatility has increased
- Major spikes in imports in second half of 2006 following the U.S. ethanol price spike
- Imports enter through a variety of ports, including Houston, New York, Miami and the east and west coasts destined for refinery blending plants.
- In some periods California ports have been major destination, but not recently.

QUARTERLY U.S. IMPORTS OF ETHANOL AND IMPORTS VIA CALIFORNIA PORTS 2000-2008

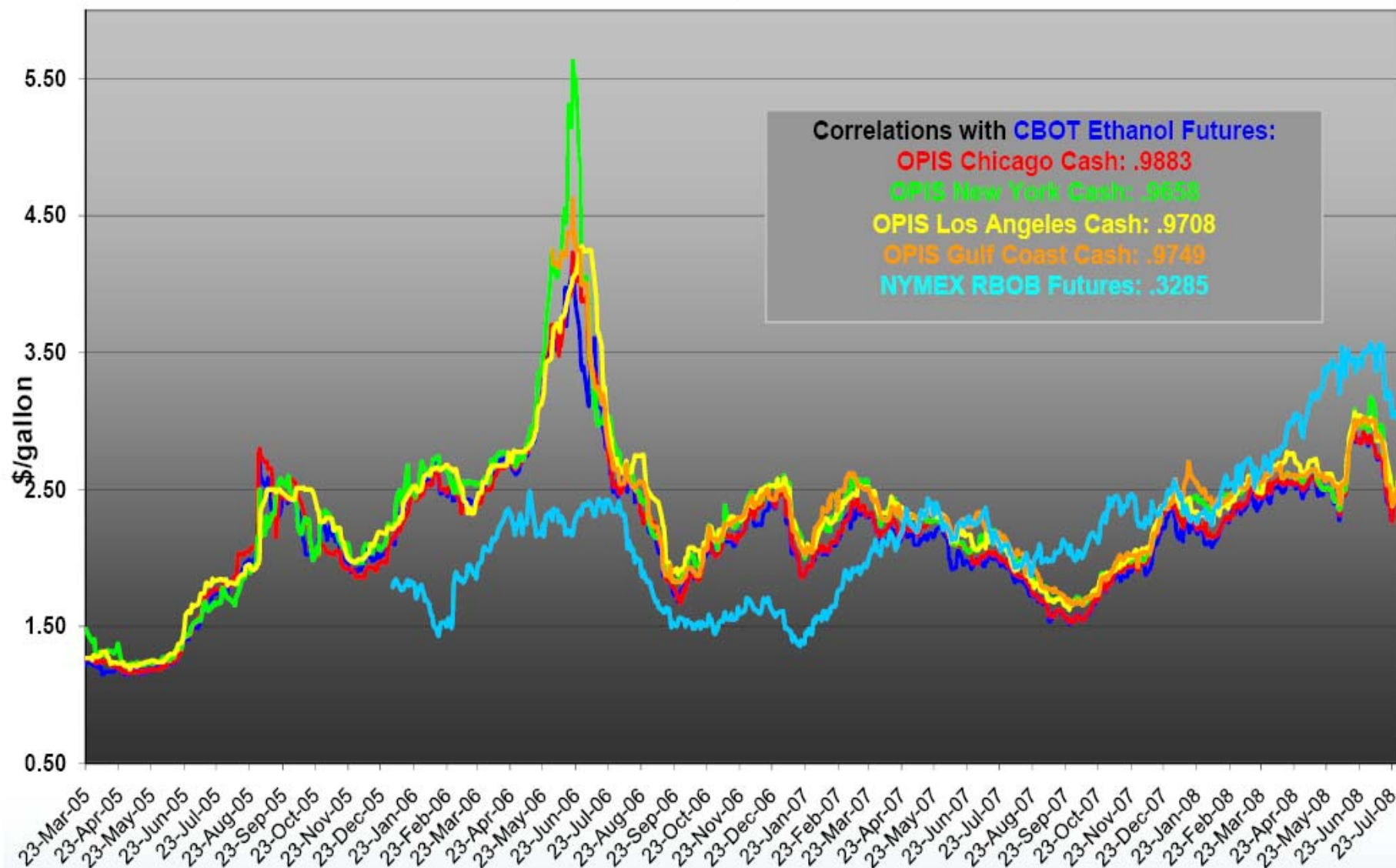


Ethanol Price Patterns

- Ethanol prices move together...the U.S. market is integrated. The futures and cash prices move together.
- Substantial volatility in U.S. ethanol prices more than gasoline prices
- All domestic ethanol prices spiked in 2006
- (California prices are higher, consistent with transport costs for ethanol and corn.)
- Gasoline and ethanol prices are much less clearly linked
- Import unit values move generally in line with U.S. internal prices, but have been less volatile

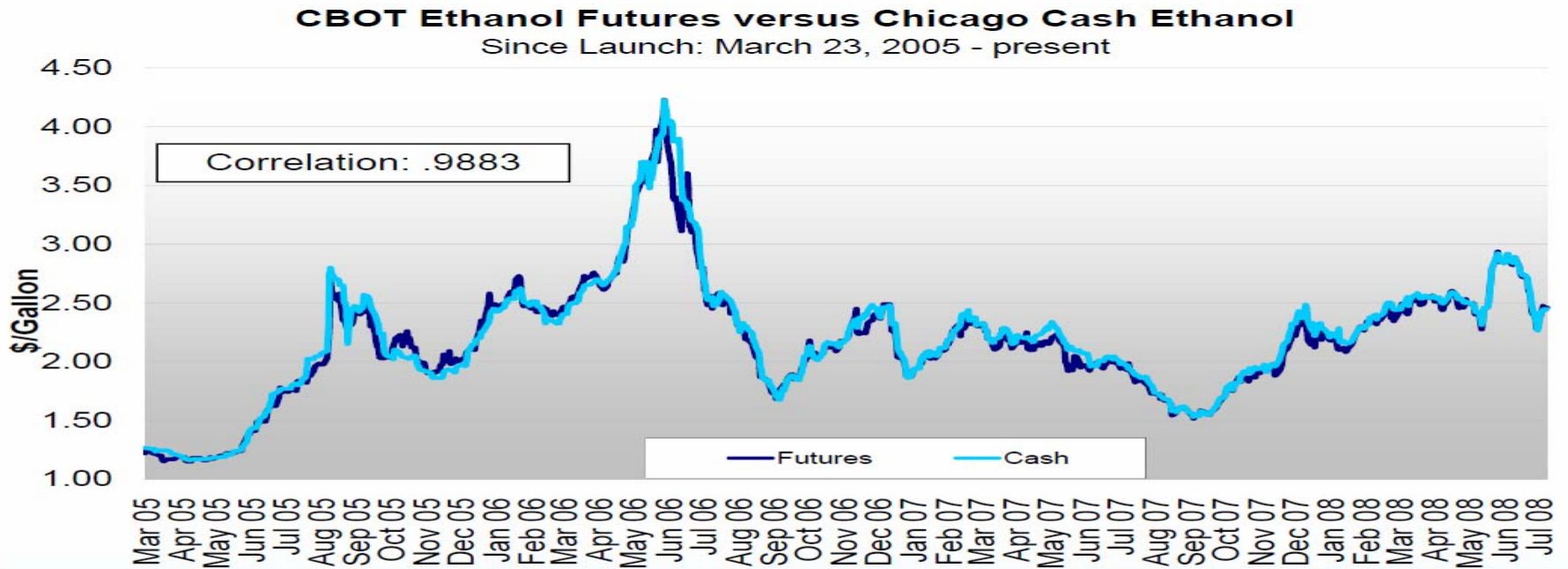
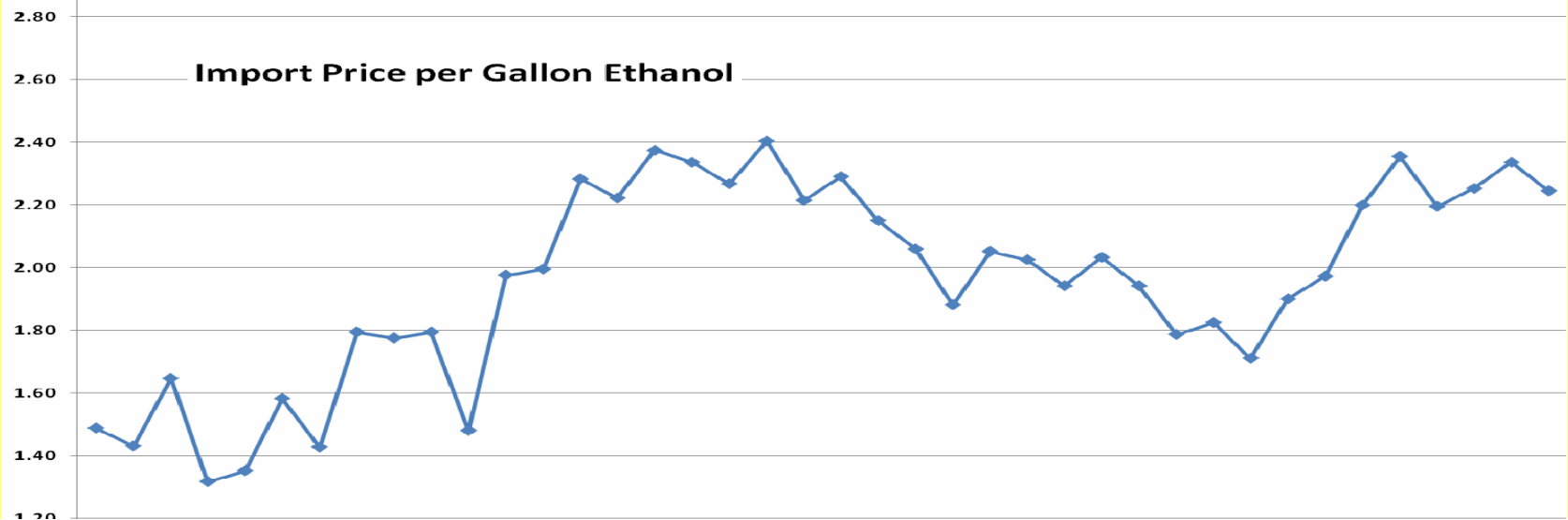
CBOT Ethanol & NYMEX RBOB futures versus Cash Ethanol

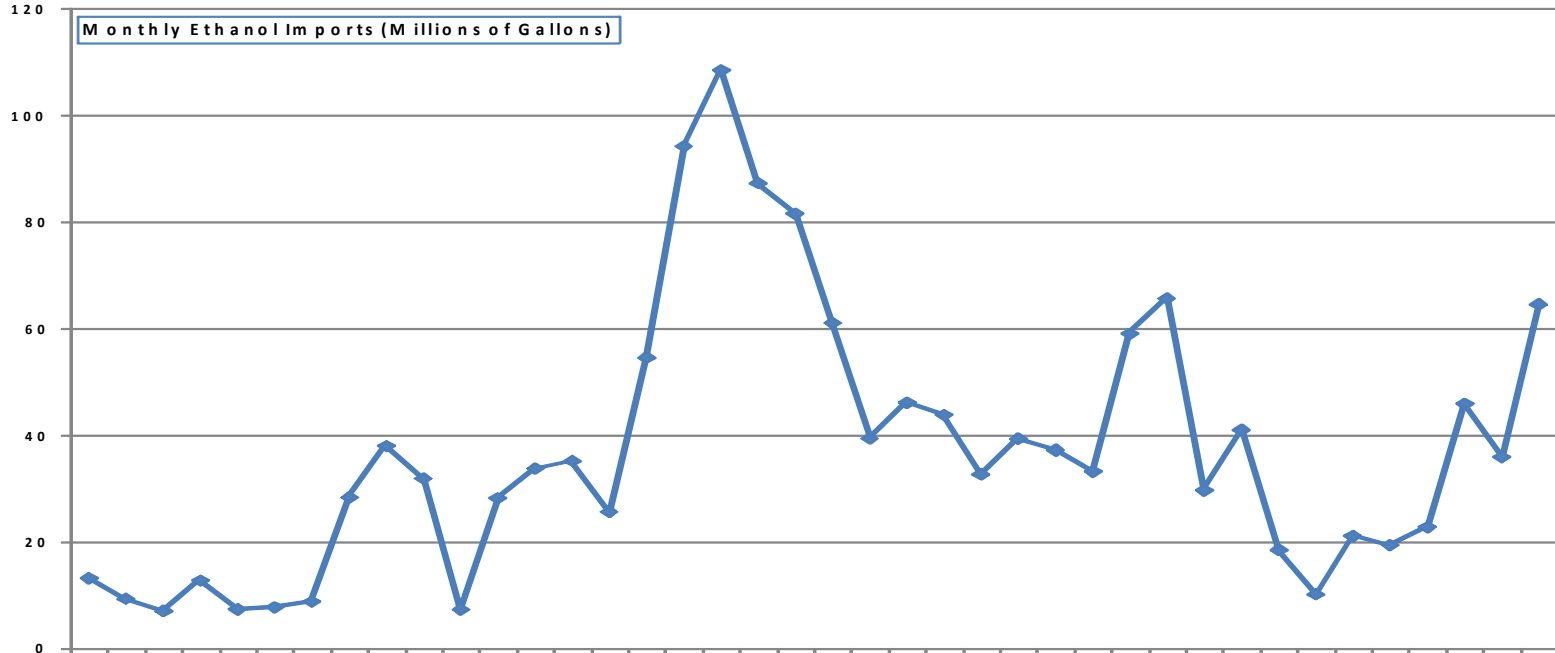
Since Launch: March 23, 2005 - Present



CME Group

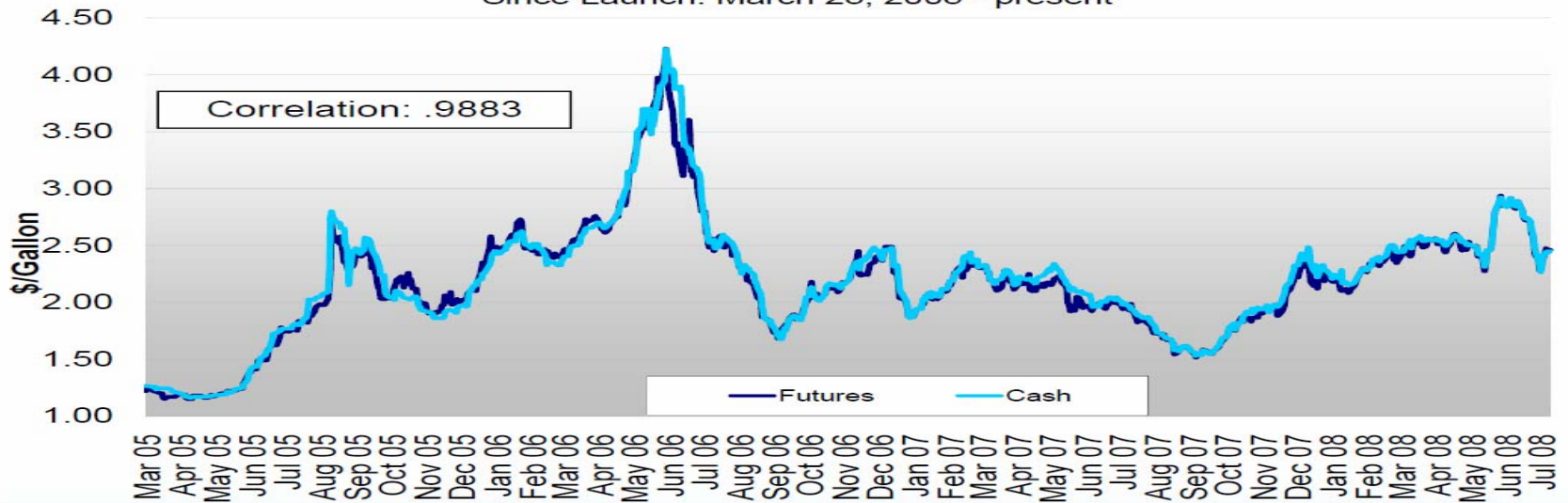
A CME/Chicago Board of Trade Company





CBOT Ethanol Futures versus Chicago Cash Ethanol

Since Launch: March 23, 2005 - present



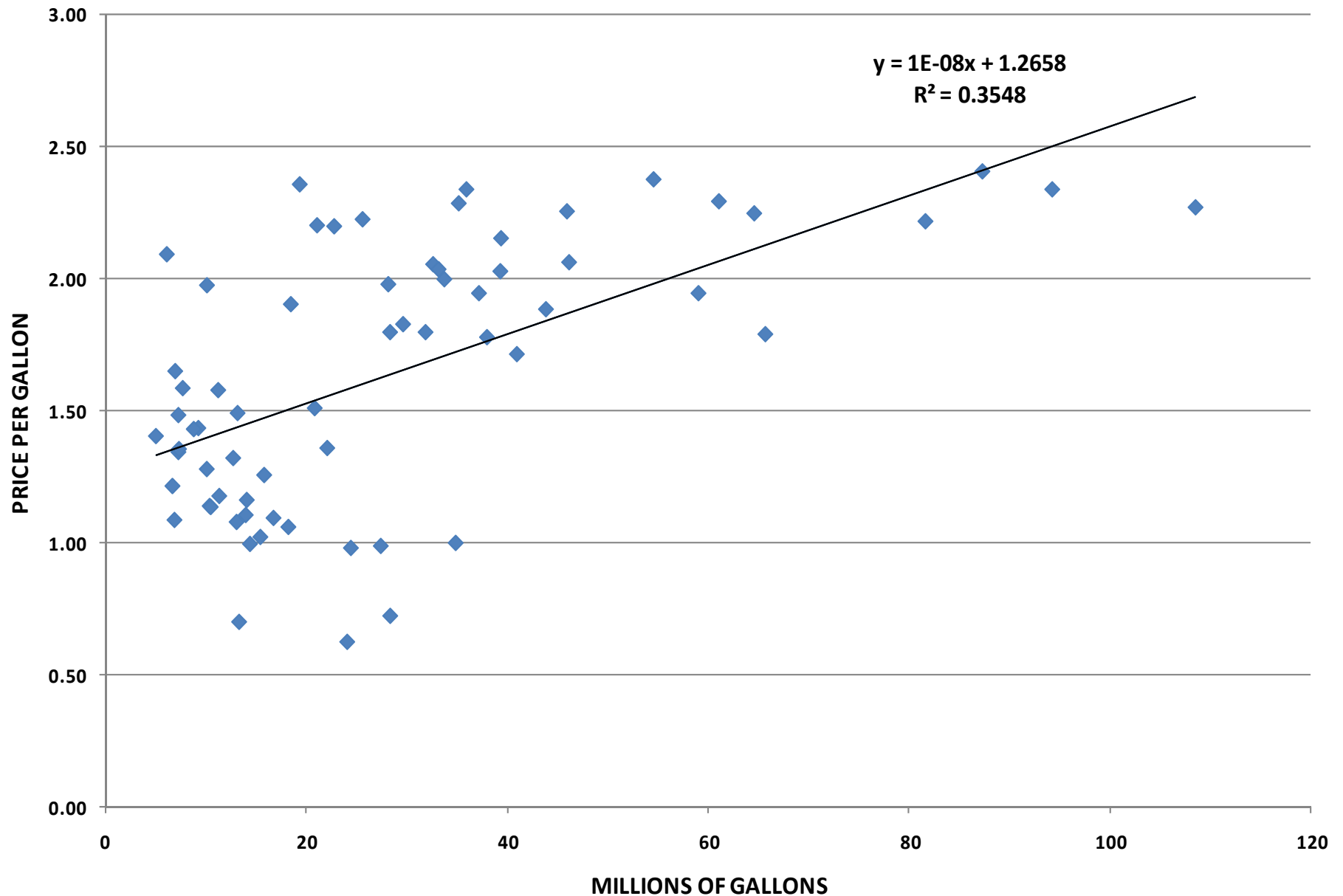
Ethanol import quantities and import unit values

- Ethanol supply to U.S. is positively related to the U.S. price. The U.S. is a large importer. A high price in U.S. market attracts more imports
- Demand for imported ethanol is close to horizontal and demand for imports, depending on the U.S. price, is highly variable
- The result is price quantity relationship can trace out something like a supply curve for imports
- Unit value or import price = $\text{value}/\text{quantity}$, so measurement error in quantity creates a spurious negative relationship
- Domestic price is the appropriate RHS variable

(Econometrics awaits better U.S. ethanol price data)

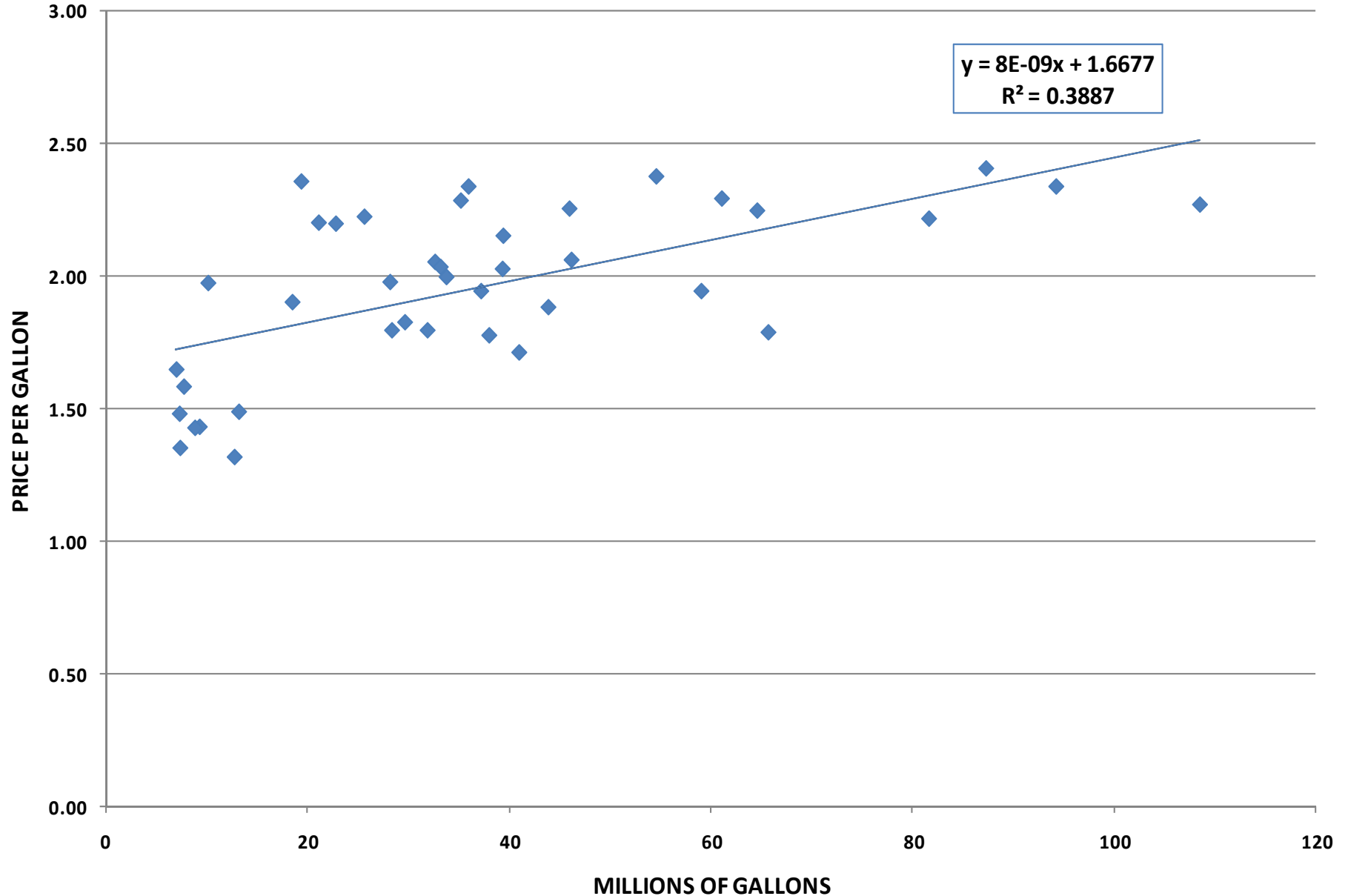
MONTHLY U.S. ETHANOL IMPORT PRICE AND QUANTITY

JANUARY 2003 - JUNE 2008



MONTHLY U.S. ETHANOL IMPORT PRICE AND QUANTITY

MARCH 2005 - JUNE 2008



Ethanol import quantities and import unit values

- These data use imports regressed on contemporaneous unit values.
- If we think that imports respond to expected price of ethanol in the U.S. market, we need to model expectations process.
- These simple pictures do not include other explanatory variables and, in particular do not include variables to account for use of ethanol in other markets outside the U.S. or California.
- This suggests a more complex structural model of world ethanol supply and demand that solves for US imports as a part of such a model which provides the basis for the estimating equation.
- Nonetheless, these estimates suggest a clear strong positive relationship between imports and the price of ethanol.
- Ethanol imports respond to the economic incentive which suggests a cut in the import duty would encourage a substantial supply response

Consider biofuels policy impacts for an importing region

- **California is a large ethanol market with distinct markets policies, but connected to the rest of the United States and ROW and California complies with U.S. mandates and the tax credits**
- **Now, consider California as a separate unit linked to the RoUS by a free trade agreement (the commerce clause of the U.S. constitution) and consider the impact of import duty**
- **California pursues, or tries to pursue distinct policies, especially with respect to environmental regulations, including implementation of the federal clean air act amendments and climate change policy**
- **California welfare impacts from biofuels policy are not aligned with the Midwest**
- **Let's consider biofuels policy from the view of a major importer of both ethanol and corn**
- **It seems quite natural for California to consider ethanol policies from a different perspective than the midwest**



Arnold Schwarzenegger, Governor

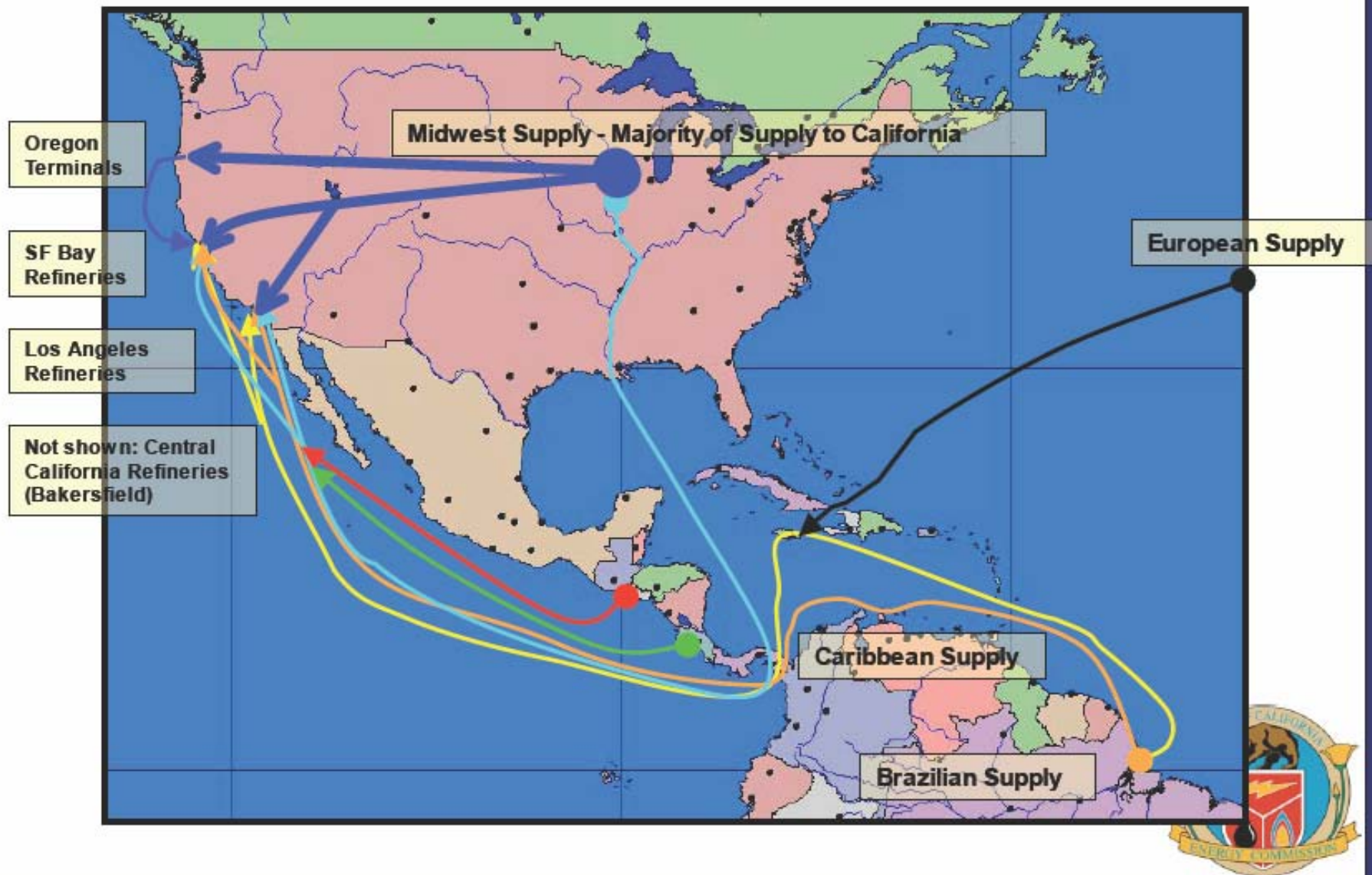
California is a major importer of both corn and ethanol, recent data

- **California produces about 0.5% of US corn (used mostly for livestock feed)**
- **California produces about 1.5% of US ethanol (mostly from corn shipped from the Midwest)**
- **California is major importer of corn mainly for livestock feed, but also for ethanol**
- **California is a major importer of ethanol (produces about 150 million gallons or 15% of use)**
- **Given policy shift to meet Clean Air Act rules (replacement of MTBE), California accounts for almost one bil gallons, about 12%, of U.S. ethanol use (share has fallen from 20% as total US has risen)**

Ethanol plant location and California agriculture

- Why not produce ethanol in California? May seem obvious but we have people scouring the state for locations to produce cellulosic feedstock and to use sugar grown in the desert
- Two modes currently action: (1) ship in corn for ethanol, (2) use local corn
- As a major importer, California corn price has been about \$0.40/bushel above the Midwest price
- Generally, considering transport of corn versus transport costs for ethanol, ethanol transport wins that calculation
- Transport costs for feed byproducts. California dairy uses grain from the Midwest with western alfalfa hay and silage
- California simply has very little cropland compared to Midwest states and no great blocks of available land
- 4.5 million acres in field crops compared to 25 million acres in Iowa and another 20 million acres in Minnesota
- Hay and silage have very high transport costs and California dairy demands two million acres of these field crops
- Finally, of course, fruit and vegetable land will not shift to corn

California's Ethanol Flows



California is a prime market for ethanol imports

- Transport costs from Midwest are significant but below transport costs from Brazil.
- Plants for blending are at the ports. Oil arrives the same way as the imported ethanol



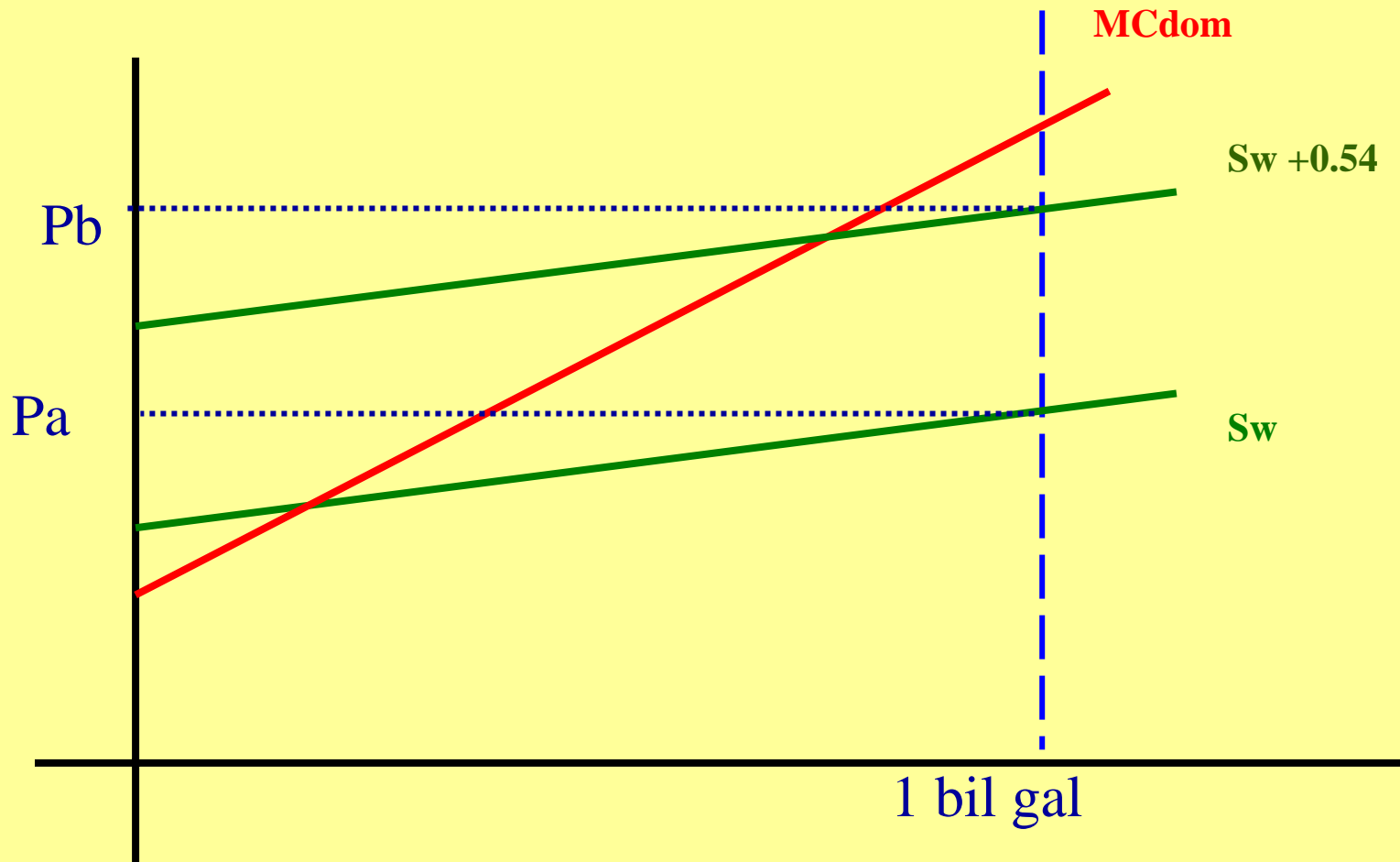
Biofuels demand side rigidities

- **Clean air rules and regulations have been the most important demand side driver for ethanol use**
- **California rules to implement the Clean Air Act Amendment requires reformulated gasoline with oxygenates**
- **Ethanol took over from MTBE as the additive for oxygenated fuel in 2004.**
- **Use in California is at the limits required for blending**
 - **About 5.7% of total fuel use is ethanol,**
- **But, ethanol has volatility problems such that California regulations limit use not to exceed that required to meet the oxygenate requirements in California reformulated gasoline**
- **Bottom line, the demand for ethanol is fixed at 5.7% of total fuel and total fuel use has been stagnant with population growth, but better gas mileage and some response to higher fuel prices about 900 million to one billion gallons of ethanol**

Demand for ethanol in the U.S. and California

- **Derived demand for ethanol=(ethanol demand/gal of blended gasoline)*total blended gasoline**
- **Ethanol and gasoline complements under ethanol mandates and fixed share under air quality restrictions**
- **Perfect substitutes when ethanol is used as a fuel extender**
- **Price of gasoline can be treated as almost exogenous**
- **In the California market now ethanol use is fixed at 5.7% of motor fuel to meet oxygenate requirements and violates other EPA rules if it goes over this amount.**
- **With the gasoline usage exogenous to ethanol price, we can treat demand function for ethanol as inelastic.**
- **Quantity of ethanol used is about 900 million to 1 billion gallons**

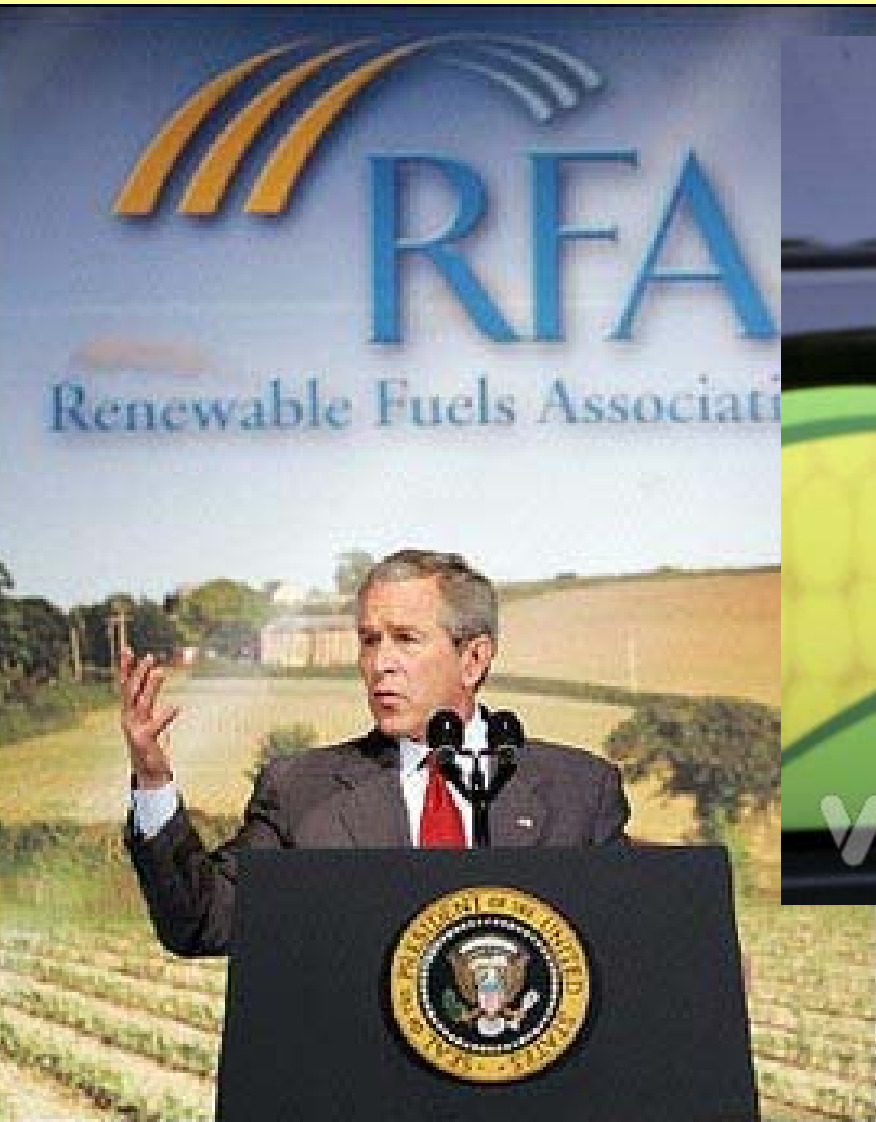
The main welfare effect in California from removing the \$0.54 duty is simply a lower price of ethanol for buyers, shown as \$0.54(1 bil.gal), when federal mandate is binding the full price effect applies. As a fuel extender no price effect and only a shift of producer surplus and duty revenue impact.



Local, RoUS and RoW Ethanol in the California Market: the major direct welfare effect of removing the duty

- **Local supply is up to 15% of the market with corn from Midwest. Overseas imports are volatile from zero to 20% of the California market.**
- **Midwest ethanol is the other 65% to 85% of the market.**
- **Demand is fixed and imports are already almost competitive**
- **Removing the \$0.54 per gallon duty (other policies remaining in place) would benefit California consumers directly => \$500 million.**
- **Corn price drop, say, \$0.40/bu (based on others estimates) for 500 million bu. imported => \$200 million gain**
- **Local ethanol plants lose capital value, grain producers lose and grain users gain and for California grain users are a much bigger group**
- **Of course, taxpayers also lose the tariff revenue on current imports (small), and if the gasoline price declined slightly that gain needed to be added**
- **Why would not representatives from California support removal of the ethanol tariff under these circumstances?**

Policy clout matters in Washington and Sacramento, puzzling support for ethanol in the California political environment



California regulation likely to change biofuels use

- **Implementation of California legislation on mitigating global warming has had a major role for biofuels as a part of the strategy to reduce carbon**
- **Legal battles with U.S. EPA over states rights to deviate from federal standards to deal with global rather than local issues, but California likely to win, in the courts or politically after 2008**
- **Rationales for more biofuels, including environmental and GHG contributions are on the demand side and are better met by imports from Brazil rather than from corn-based ethanol from Midwest**
- **Probably worse is ethanol production from corn in California**

California Low Carbon Fuels Standards and Ethanol

- The California Air Resources Board (CARB) and others must determine the “life-cycle carbon intensity” of transportation fuels to contribute to the California mandate that carbon intensity of fuels be reduced by 10% by 2020.
 - This means the whole fuel mix must be 10% less by 2020, and if half or more remains gasoline, the other half must drop intensity by 20% lower than now.
 - Oddly if current ethanol is deemed high carbon shifting to sugar-based ethanol for the 5.7% now ethanol would be an even greater gain
- The major issues are how to best approximate carbon intensity. In addition, generable “sustainability” standards may be required.
- Ethanol from corn may not do well under this life-cycle analysis and ethanol from sugar may do much better.
- But, potential discrimination against imports which could raise WTO compliance concerns (Iowa can’t haul CA into the WTO)
- WTO agreements do not preclude environmental standards, but generally process rules are suspect because they are easy to use to discriminate

Potential WTO Dispute Issues for Biofuels Trade

Last year's issue

“Canada and Brazil also have made claims that the U.S. is over its \$19.1 billion "aggregate measure of support."

Besides questioning direct payments, Brazil is questioning the 51-cent blenders tax credit for ethanol....”

**“WTO-Tinged Farm Bill Unlikely” Chris Clayton, DTN Fri Sep 28, 2007
09:33 AM CDT**

This is an AMS argument not a price suppression or other serious prejudice claim... clearly ethanol importers gain from U.S. ethanol blenders credit even as corn farmers also gain. Not clear if Brazil will pursue this point, but let's consider the consequences for the AMS calculations

US WTO obligations and negotiations

Based on the URA not a Doha Deal. Also, based on 2005 data not current and projected AMS with low payments

- **Aggregate Measure of Support (AMS) under the URA/WTO is capped at \$19.1 billion... It should include buyer-side subsidies that benefit producers.**
- **The US did not include ethanol subsidies in AMS notifications in 2007. This total might be \$3 or \$4 billion or more as more ethanol is used**
- **Not clear why the U.S. calculation of AMS has not included blender tax credit**
 - **Ethanol is accepted as an agricultural product and no one disputes that farmers benefit from the benefit**
 - **Perhaps initially it was a small issue and after the subsidy grew it was awkward to include in the AMS**
- **This issue does not seem to be on the front burner now, but depending on the base year could be awkward and could be awkward in renewed Doha negotiation and implementation**

“Brazil sees WTO ethanol case against U.S. soon”

Tue Sep 2, 2008 RIO DE JANEIRO (Reuters) – ‘Brazil, the world's largest ethanol exporter, may soon challenge the United States at the World Trade Organization over its tariffs on imports of the fuel, Foreign Minister Celso Amorim said on Tuesday.

"My reading is that we have a very strong case and so there is a good chance we will challenge," Amorim told reporters in Rio... Exporters see the import tariff of 54 cents per gallon as an obstacle to shipments of sugar-cane-based ethanol to the United States,....

Brazil's Sugar Cane Industry Association hired lawyers to study the compatibility between the U.S. tariff and WTO rules.

Amorim said the case could be presented in the next one or two months, depending on final consultations with producers and the government's lawyers.’

Summary remarks

- **Imports have sometimes been a significant part of the domestic market even with high tariffs**
- **Transport costs in the U.S. determines plant location and feedstock use**
- **Import restrictions benefit ethanol producers, but is hard to square with externality arguments of biofuels consumption (or environmental concerns)**
- **Demand conditions crucial in determining incidence of the benefits of the trade barriers**
- **WTO compliance issues may also weigh in, but the basis of the case remains unclear**