

Has information been an obstacle for the development of the biofuel international market?

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Introduction:

This paper aims to answer the following questions: what kind of international market for biofuel do we need; what kind do we have; and, in a more speculative way, what kind are we likely to have.

The international demand for biofuel is driven mainly by environmental concerns, frequently associated to the vague term 'sustainability'. As this information is not readily and freely available within the product and consumer experience does not help to inform about those features, biofuel, at least for the international demand associated to GHG, is a credence good. As a consequence, trade mechanisms that credibly transmit information about the credence attributes related to sustainability are needed.

Moreover, each demander requires a specific 'information set' related to the environmental (and social) standards, making the coordination problem is more complex. These are the marketing features that are required for flourishing of the international trade of biofuel.

Results and Conclusions

The received literature (IEA, 2008; Bolwig and Gibbon, 2009) states that, despite the possible lack of those features, the international trade is quite prosperous, increasing its relevance related to domestic production. According to IEA (2008), the international trade accounts for about 20% of total production. Our research disputes those figures. First, the relevance of international trade is actually diminishing. On the one hand, world ethanol production has been increasing dramatically, by an average growth rate of 19% during the last eight years. On the other hand, ethanol trade has also been increasing, but at a lower rate, and not monotonically. As a consequence, the share of international trade related to domestic production is decreasing.

Second, the figures presented in the received literature are overestimated, since the double count re-exports. In order to have a more reliable estimation of the relevance of the international trade of biofuel it is necessary to account only net exports. Then trade represents only 10% of domestic production. If regional markets are aggregated (e.g. EU), figures are even lower, about 5%.

As a consequence, although ethanol is a promising world commodity, it is still mainly a domestic commodity, and the international trade is yet to flourish.

Not only the international market is not prospering, but also the majority of the ethanol currently traded does not carry the required information about sustainability.

Qualitative evidence from Brazilian exports indicates that some demanders from Japan and the EU require a comprehensive information set related to sustainability attributes. The required information about credence attributes is then transmitted by means of long term bilateral and idiosyncratic contracts that defines contract duration, safeguards, pricing rules, and the 'information set' that express sustainability. In contrast, exports to the U.S. and the Caribbean

derive from short term relative prices opportunities, relying on spot and forward short term contracts.

This qualitative evidence is compelling, but cannot be generalized. As a consequence, we proceeded with a quantitative analysis of propositions derived from the qualitative evidence. If exports from Brazil to the EU and Japan are indeed based on long term contracts, as opposed to exports to the U.S. and the Caribbean, one should observe different regularities in the monthly data about Brazilian exports for each destination. The expected regularities are the following: exports to the EU and Japan shall present lower variance of quantity, stable seasonality, and non persistent price shocks; exports to the U.S. and the Caribbean shall present higher variance, moving seasonality, price shocks persistent for the period of arbitrage of short term contracts.

Regarding the variance of quantity and price, (US: 1.16 and 0.26; Caribbean: 0.92 and 0.22; EU: 0.67 and 0.20; Japan: 0.58 and 0.22) we find significant differences between the two groups that are consistent with the differences in governance structures. Regarding seasonality, for the US and the Caribbean we find no evidence of stable seasonality on quantities and on prices, and seasonal monthly index consistent with arbitrage between prices in the U.S. and Brazil. Both results are consistent with the proposition of exports driven by price opportunities year by year. For the Japan and the EU, we find evidence of stable seasonality, and seasonal monthly index consistent with Brazilian production seasonality. Also both results are consistent with the use of long term contracts.

Regarding price volatility, we find that in the U.S. and the Caribbean export series, price shocks have a degree of persistence consistent with arbitrage in the forward market. We find no evidence of persistence in the series of Japan and the EU, also consistent with the idea that the price shock does not induce further adjustments. Moreover, we find that the magnitude of shocks is not significant in Japan exports.

In short, we have evidence that the majority of the ethanol traded is not 'sustainable ethanol', since they are directed to the U.S. and the Caribbean, for which there are no trading mechanisms to transmit information about sustainability. Sustainable ethanol is traded by means of long term contracts just because the multilateral trading mechanisms that transmit information about biofuel socio-environmental sustainability are not yet in place.



There are still several constraints for the emergence of market institutions for sustainable biofuels. First, there are dozens of certifications associated to different 'information sets', and not yet an established standard. Second, the coordination problem is aggravated because of network externalities and the lack of authority. If the task of establishing a standard were a domestic issue, government authority could solve it at a lower cost, but this is not the case for international transactions. Finally, standards that are likely to emerge from European demand may conflict with WTO norms.

These results have the following implications: a) eliminating trade barriers is not a sufficient condition to enhance trade (of sustainable biofuels); b) multi-market models should take into account important frictions in the international market, specific for each trade flow; and c) information is likely to be an important constraint to the development of bioenergy as an alternative to fossil fuels. The development of the international market for biofuel depends on multilateral public policy that addresses particularly the information constraint.


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