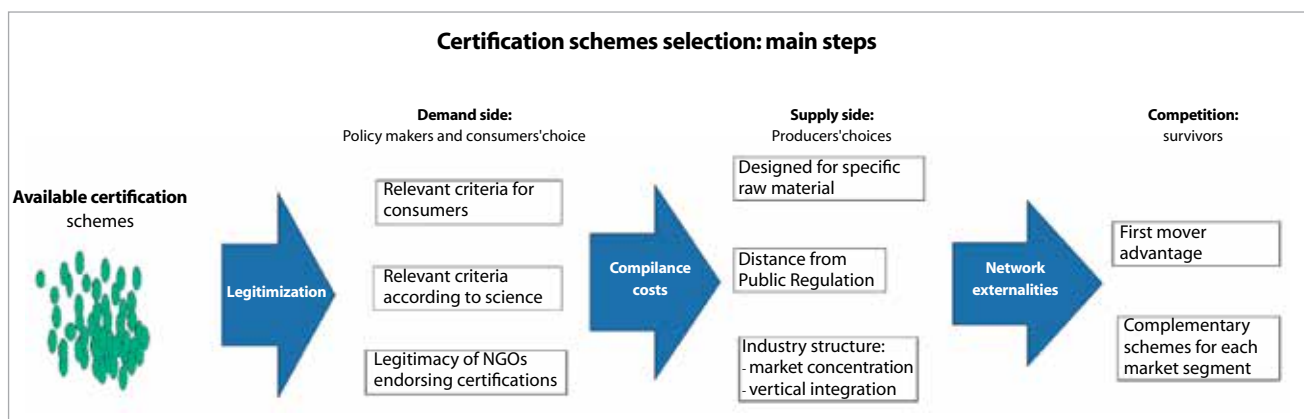


## INTERNATIONAL BIOENERGY MARKET: ASSESSING INSTITUTIONAL STRUCTURES

Paulo Furquim de Azevedo

Inspere Instituto de Ensino e Pesquisa (Insper Institute of Education and Research)

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Source: Perosa and Azevedo (2015)

The fast-growing global bioenergy market and the particular features of its demand bring into question the production and trade of renewable products and how they should be regulated in the years to come. Institutional structures governing renewable energy trade are costly and still vaguely defined. Different from regular commodities markets, the emergence of market institutions in the international trade of bioenergy products requires mechanisms that transmit information about socio-environmental sustainability, inasmuch as this is an essential feature of its growing demand.

We investigate the current institutional features of the emerging – and still incipient – international bioenergy market, in particular the capability of those institutions to encompass the production of a broader range of third world countries, so as to increase the number of suppliers and to mitigate risks associated to regional supply shocks, such as draughts or political instability. A more reliable supply of bioenergy products seems a necessary condition for fostering the international demand by energy consumers, particularly for the adoption of mandates and other mandatory

consumer measures.

This task is complex because bioenergy products are by large credence goods, i.e., they must carry the information of environment sustainability, which drives the demand for bioenergy products. As a consequence, specific coordination is required in order to establish international standards, and to build institutional arrangements to transact information about the credence aspects of those products, both oriented to the reduction of transaction costs in this emerging market.

This research work aims to understand how institutions of international bioenergy markets will develop in the next years, and what the most relevant impacts will be on the competitiveness and production sustainability in Brazil and other potential producers, particularly in Latin America and Africa. By understanding better the factors involved in the development of bioenergy market institutions, we expect to support public policies oriented to the sustainable development of third world countries, as well as to stabilize the geopolitics tensions derived from the regional concentration of oil- based energy.

## SUMMARY OF RESULTS TO DATE AND PERSPECTIVES

The received literature states that the international ethanol trade is quite prosperous. Our research disputes this conclusion. The relevance of international trade is actually diminishing and the majority of the ethanol currently traded does not carry the required information about sustainability. As a consequence, although ethanol is a promising world commodity, it is still mainly a domestic one, and the international trade is yet to flourish.

Cointegration analysis of time series of ethanol prices indicates that there are no strong and direct connections between two most important domestic markets for ethanol, Brazil and the U.S. This finding is consistent with the anecdotal evidence that there is not yet a well-developed international market for this biofuel. As a result, due to the lack of appropriate socioenvironmental governance, the international ethanol market is yet not able to coordinate production and consumption decisions across countries.

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; and c) information is an important constraint to the development of bioenergy as an alternative to fossil fuels. Important constraints for the emergence of appropriate market institutions are: the lack of an established and dominant certification system; complex intergovernmental coordination; and the harmonization between socioenvironmental requirements and WTO norms.

Our analysis indicates that the development of certification systems is driven by three pre-existent variables: public regulation, industry competition and organization, and legitimation mechanisms, whose interaction determines the evolution of socioenvironmental governance. Competition among certification systems and network externalities result in the convergence of public and private environmental regulations. As a normative implication, the efficacy of socioenvironmental governance depends on the compliance costs and, as a consequence, on the prevailing public regulation. The latter must be designed not only taking into account its direct effects, but also its indirect effects on the development of private certification systems.

Technological and organizational features of biofuels production also play an important role on the development of certification systems, affecting compliance and coordination costs. This may limit the emergence of new players from Africa and Central America.

## MAIN PUBLICATIONS

Shikida PFA, Azevedo PF, VIAN, CEF. 2011. Desafios da agroindústria canavieira no Brasil pós-desregulamentação: uma análise das capacidades tecnológicas. *Revista de Economia e Sociologia Rural* (Impresso). **49**: 599-628.

Shikida PFA, Perosa BB. 2012. Álcool combustível no Brasil e path dependence. *Revista de Economia e Sociologia Rural*. **50**: 243-262.

Perosa BB. 2012. Mercado internacional de biocombustíveis: a emergência da governança socioambiental. *Agroanalysis* (FGV), São Paulo. **32**: 25-26.

Margarido MA, Azevedo PF, Shikida PFA. 2012. Eficiência e coordenação oligopolista no mercado de etanol anidro no Estado de São Paulo: uma aplicação dos modelos ARCH/GARCH. In: *Indústria, Tecnologia e Trabalho: desafios da Economia Brasileira*. Orgs.: Anita Kon e Elizabeth Borelli. São Paulo. 474p.

Perosa BB. 2013. Biocombustíveis: mudança no mandato na União Européia. *Agroanalysis* (FGV). **33**: 23-24.

Serigati FC. 2014. Mandatos de etanol dos EUA: Impacto sobre a agricultura brasileira. *Agroanalysis* (FGV). **34**: 21-23.

Souza AN, Orellano VIF, Azevedo PF. 2014. Elasticidade-preço da demanda por etanol no Brasil: como renda e preços relativos explicam diferenças entre estados. *Revista de Economia e Sociologia Rural* (Impresso). **51**: 699-718.

Orellano VIF, Azevedo PF, Saes MSM, Nascimento VE. 2015. Land invasions, insecure property rights and production decisions. *Journal of Agricultural Economics*. **66**: 660-671.

Perosa BB, Azevedo PF. 2015. The evolution of environmental governance mechanisms: learning from forests, applying to biofuels. *Regulation and Governance* (under revision).

Paulo Furquim de Azevedo

Centro de Pesquisa em Estratégia  
Insper  
Rua Quatá 300, Vila Olímpia  
CEP 04546-042 – São Paulo, SP – Brasil

+55-11-4504-2547  
paulofa1@insper.edu.br