

**Full Information Product Pricing Regimes:  
Policy Implications for U.S.-Mexico Sustainable Commerce**

by

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### I. Information Asymmetry, Full Information Networks, and Sustainable Trade

Information asymmetry has frequently been identified as an important element to explain market dynamics (Akerlof 1970). In some markets, some players (usually the sellers) have better information than others about product quality (usually the buyers). Although in most markets it is possible to find “good” and “bad” products, both kinds of products have to be sold at the same price because consumers have difficulties telling the difference between them. This phenomenon can also introduce several issues of externalities in production methods (e.g., pollutants from production, exploited workers) that might not be fully incorporated into final market prices.

Although information asymmetries decline over time as markets grow and mature due to quality information acquired by repeated use (Wankhade and Dabade 2006), some products such as tomatoes, coffee, or beef are less likely to experience such dynamics because they are not always linked to information other than price. As an alternative strategy to reduce information asymmetry, a growing number of consumers and producers are increasingly paying attention to information about where, when, how, and by whom our food and goods are produced. We are calling such sets of relationships between consumers and producers “Full Information Product Pricing (FIPP) Networks.”

Although non-price information is sometimes a requirement to import goods and services (for example, in the case of food safety), there is not a single way to handle information and requirements to find the right balance between promoting commercial exchange and creating protective trade barriers. In state-led trade systems, multilateral, regional, or bilateral negotiations produce trade agreements that are enforced by dispute settlement mechanisms in the World Trade Organization (WTO). Multilateral rules say little in general about non-price information related to social, health, or labor standards. Regional or bilateral agreements sometimes incorporate these issues as narrow sets of standards or as side agreements to the main text. Many states also unilaterally adopt formal trade preferences, which allow governments to restrict trade from states that they claim violate non-price principles, and promote trade from states who uphold them.

institutional changes needed to implement the sixth type of FIPP system, before finishing with policy recommendations.

### II. Research Supporting this Project

The research that supports this paper emerges from the ongoing work of the North American Digital Government Working Group, a consortium of researchers exploring the impact of product labeling, data architectures, and government-sponsored information policies on the market share of organic, fair trade, and eco-friendly products in the NAFTA region. In these alternative markets, price is often complemented with information, transmitted through trusting networks or certification labels that convey the conditions under which a product is produced and distributed.

Our full research team has been involved to date in five interlinked streams of work that explore how FIPP regimes can be supported and encouraged by market and government action in domestic, international, and especially bilateral trading regimes such as the NAFTA agreements. Since our work originated with the North American Digital Government working group, it continues to be centered on the case of coffee grown in Mexico, and roasted and consumed in the United States and Canada.

*Case Studies of Existing FIPP Systems.* As part of this work, we have completed a number of case studies from the NAFTA region (Zhang et al. 2008), where producers created and sustained a FIPP network to deliver products to end consumers with a value-adding information package that allowed them to appeal to specific consumer preferences for products with better social or environmental impacts while at the same time realizing a price premium.

*Analysis of Trust Relationships within FIPP Networks.* As an extension of this case study work, we completed an analysis of types of consumer-producer trust relationships and their drivers and inhibitors (Luna-Reyes et al. 2009; Luna-Reyes et al. 2011). This case-based work reinforced the experimental work of Komiak and Benbasat (2006) and demonstrated the importance of trust in FIPP networks, and in the adoption and use of online recommendation agents by end consumers.

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participants in the supply chain need to be certified, and these government institutions have the faculties to trace goods and products, identifying the certifying agency inside their own borders. In this system, different countries develop and sanction their own laws and regulations. Producers take the burden of multiple certifications, complying with each country standard.

- Consumer-driven social computing systems are networks of consumers who research environmental, social, or ethical practices in organizations, sharing the information with other consumers, so they can make their buying decisions. These networks use the Internet or other electronic media to communicate and disseminate their findings, and some of them incorporate social media and Web 2.0 applications in their strategies. Examples of these networks are the associations Buy it like you mean it (BILUMI; <http://www.bilumi.org/Main/>) in the United States, or El Poder del Consumidor in Mexico ([http://www.elpoderdelconsumidor.org/main\\_page.html](http://www.elpoderdelconsumidor.org/main_page.html)).
- Proprietary supply-chain-driven systems are produced by private sector organizations (such as Walmart) in order to differentiate their products. These systems need global databases of products as well as a method for assessing product characteristics and rating them across an array of options.

The next section compares these five ideal types of FIPP regimes in terms of their key features: their underlying values, governance, connections between consumers and producers, costs, data quality, and consumer trust.

### III. Policy Domains for this Discussion

Table 1 presents a comparative overview of the underlying values and five crosscutting issues that frame the effectiveness of the five differing types of FIPP regimes. The first column on the table shows the underlying values behind the system. The “gold standard” is face-to-face communication and interactions in a close community. Voluntary certifications rely on producer decisions to join an organizational network committed to specific environmental, ethical, and social values. Although international organizations promoting voluntary certification exercise some influence in product commercialization opportunities, certification only becomes

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**Table 1. Cross-cutting Policy Issues across Various Types of Full Information Product Pricing (FIPP) Regimes (Whitmore et al. 2010)**

FIPP Type	Underlying Values	Governance and Oversight	Who Pays? (and financial incentives)	Data Quality and Independent Verification	Consumer Trust	Implications
<b>Face-to-face producer-to-consumer networks</b>	Replicate traditional communities of trust	Individuals know and trust each other	Personal connections and trust dominate supply chain	Trusted information integrated into final product price	Trusted relationships obviate need for data verification	“Gold standard” based on personal knowledge and trust
<b>Voluntary Certification Organizations</b>	Producers certifying compliance with standards	Typically NGOs linked to producer organizations with some retail networks	Certification focuses on producers/consumer confidence critical	Producer organizations or co-ops pay fees to certifying agencies	Voluntary self-reporting with diverse verification standards	Depends on reputation of certifying organization at consumer sites
<b>Government-sanctioned Certification Regimes</b>	Government certifies compliance with standards	Government agencies with legal mandate and sanctions	Often entails complete monitoring of complete supply chain	Taxpayers support consumer protection functions, producers pay fees to certifying agencies	Data quality and independent verification and inspection key components	Usually high, can be tempered by cynicism about industry lobbying efforts
<b>Consumer-driven Social Computing Systems</b>	Consumers inform each other of compliance with standards	Loose networks of like-minded consumers	Consumers provide opinions on producer and supply chain practices	Typically low cost, with consumer input to populate evaluations	No independent check on data quality beyond crowd sourcing	Social networks typically create high consumer trust
<b>Proprietary Supply-Chain-Driven Systems</b>	Commercial interests align with consumer confidence	Corporate integration by dominant retailer or vertically integrated supplier	Data systems track some aspects of production for complete supply chain	Tracking systems incorporated into production/distribution costs	Profitability depends on reliable supply chain data, but no third party verification	Consumers must assess information sources and corporate intentions
<b>Scalable Internet-enabled Open Source System (I-Choose Prototype)</b>	Open access to reliable inspection and certification information	Mixed governance by standards bodies (ISO), industry, and possibly government-led sanctions	Certification and inspection information provided via common standards on the Internet	Internet infrastructure sponsored by supply chain operators (who capture a price premium)	Third party consumer advocates actively policy information—possible government sanctions for fraud	Key issue for these systems to succeed—likely linked to social computing systems to gain trust

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how using advanced technologies such as cloud computing, interoperable data architectures, and social computing systems can support the development of scalable systems that approximate some of the desirable properties of the smaller-scale networks that we studied in the four cases. Trust, all three forms of trust—institutional, calculative, and relational—will play a large role in all forms of FIPP customer-oriented systems and networks.

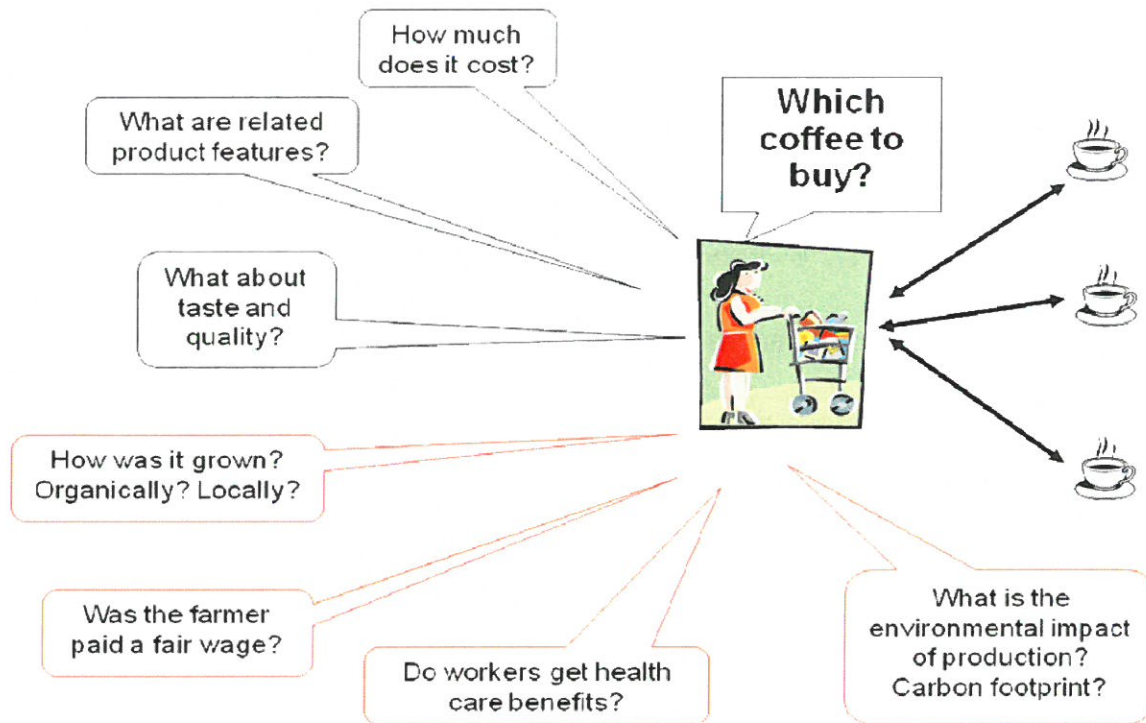
It seems clear to us that adding social computing components to such systems can be a good way to build relational trust by empowering consumer activists to play a more prominent role in FIPP-oriented markets. Research on trust in large-scale systems indicates that most individuals trust peers over faceless certification agencies. For example, the Centers for Disease Control (CDC) reports that most individuals take to heart its advice on a communicable disease such as H1N1 flu more readily when it is forwarded to them from a peer-computing site rather than when downloaded from an official CDC site. But what information can social computing sites use to develop reliable ratings? Peer ratings based on consumer experiences with the product alone will not work since FIPP packages, by definition, report on unobservable attributes of products (e.g., when produced, by whom, and under what conditions).

Simple and straightforward certification systems will probably not work because as we have seen in the cases, peers often distrust government and other official certification sources. The answer may rest in some combination of system features such as providing online unconfirmable meta-data about certifiers, providing information about how certifiers are certified, by allowing consumer advocates to rate certifiers as well as producers and supply chain operators, and perhaps even providing a legal status for some portion of the FIPP information package (with stiff penalties for providing false information or misusing such information as in the case of U.S. Securities and Exchange Commission [SEC] prosecutions for insider trading).

### **IV. The I-Choose Prototype as a Sixth FIPP, Point-of-Sale Information System Ideal-type**

Our current research is focused on creating a prototype system that might be used to explore the creation of a sixth type of ideal type FIPP network—a more fully scalable FIPP network that uses Internet-based information standards and social computing systems to deliver product

Figure 1. I-Choose: Supporting Value-Based Consumer Decisions (Luna-Reyes et al. 2011)



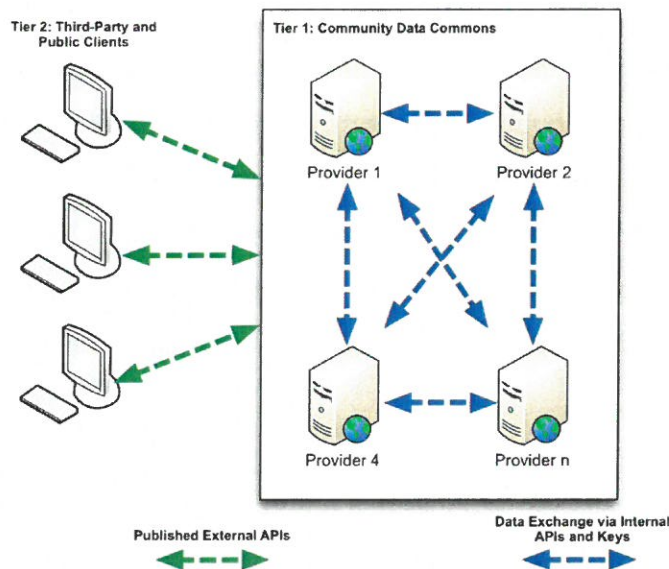
As illustrated in Figure 2, the I-Choose system has three basic operational components. First, we envision that Ellen will be shopping with a handheld shopping support device such as a smart phone. This component of the system already exists, and most are already being augmented by various existing apps. Ellen will be able to scan the Universal Product Code (UPC) of her purchase (or perhaps a radio frequency identification [RFID] tag) so that her smart shopping device can uniquely identify the product. Her smart phone device will then connect to the Internet and look up information on her chosen product, using an advanced consumer preference app to sort through the information packages available for each uniquely identified product in order to do true comparison shopping. Hella and Krogstie (2010) describe some of the details of an ontology-based shopping support system currently in prototype stage, a precursor to the system that Ellen will probably be using.

sometimes imposed by government regulation of their information environment and sometimes working to meet information and certification standards enforced by voluntary NGOs or even private-sector enterprises. Finally, consumer advocates will want to play the role of checking, simplifying, and parsing complex information packages to deliver trusted information to ordinary consumers.

We envision a two-tiered standard for data sharing that is developed through an iterative process by the various members of the I-Choose community (Figure 3). The two tiers consist of:

- An agreed upon set of data that is shared within and verified by the community (called the *data commons*)
- A subset of the data commons that is available to the public and third-party developers via standardized web-service APIs

**Figure 3. Two Tiers of Data Sharing**



In the data commons, the participating members will agree to an interface and data specifications for a Web service that each member must implement to be considered part of the community. The standard for data exchange will be an encapsulated set of internal (i.e., community) Web APIs. These community specifications will be a defined set of Hypertext Transfer Protocol



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for end consumers rests in social computing networks. The combination of standards-based data architectures to support interoperable data exchange with Web 2.0 social computing systems will produce scalable, trusted information linking end consumers to producers and their supply chains.

### V. Tools for Rethinking Bilateral and International Trade Relationships

An enormous amount of data about the provenance and safety of the products we buy, our health care, education, financial transactions, and many other activities regulated by governments are held by private organizations. Much of this data is fragmented and separate from publicly assembled datasets. As our I-Choose system shows, sharing key elements of these data through a collaborative and consensual system could potentially promote more credible and more sustainable commerce. The combined, trusted data that result from such a system could be used as an evidence base for policy decision-making, in market differentiation mechanisms, or to overcome fragmentation in some sectors that causes costs to rise.

But the use of technology to facilitate the sharing of private data also presents a number of challenges. This section explains the trade-offs associated with governing a potential I-Choose system, and discusses how they might be overcome.

#### *Existing Trade Governance and Non-Price Information*

In the modern context, it is inaccurate to speak of a single form of governance for international trade. A hierarchical global system—created by states, consisting of binding legal rules, and headed by a formal international institution, the World Trade Organization (WTO)—exists alongside a growing number of market and network-based regulatory and certification systems covering many products and services. There is a rapidly growing literature on these systems, which include standards produced by the International Organization for Standardization (ISO), products produced by transnational private sector regulators such as financial product rating agencies, industry-wide accreditation bodies, international commercial tribunals, and non-governmental product certification schemes (Auld et al. 2010; Büthe 2010; Bartley 2003; and on voluntary programs Coglianesi and Nash 2001; Darnall, Potoski, and Prakash 2010).

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toward the elimination of more broadly defined trade barriers (Trachtman 2003; Vranes 2009). This makes conflicts over domestic regulatory standards increasingly more likely.

For governments, the alternative to an increasingly conflicted state-led trading system might ultimately be to play a greater role in forming or influencing non-state regulatory and certification systems. Perhaps, as we have seen with organic products, governments will attempt to harmonize standards between emerging FIPP systems. In this sense, FIPP information could, in turn, provide an evidence base for the formulation of new product standards and regulations.

Governments already have well-established standards for public and interest group consultation on trade, public health, and environmental issues—requirements to publish their actions and hold public meetings, as well as established advisory group systems, which bring select stakeholders into regular contact with officials. Some of these public meetings, such as recent meetings to discuss the 2011 Food Safety Modernization Act (FSMA), already make extensive use of online tools. But great potential exists for governments to do more to bring consumers into the negotiating process—to make them part of the decision-making structure, not just an adjunct to it. For trade in goods, this means building a system that encourages broad consumer participation in formulating expectations for how corporations should act, incentives to support compliance with those expectations, and encouraging innovation among producers, suppliers, and entrepreneurs.

There are two key tradeoff dilemmas that regulators must take into consideration. First, governments and regulators must understand the commercial context surrounding FIPP systems, balancing cost considerations with information requirements. Second, there is a key trade-off between protecting private information and ensuring broad access to the system. Additionally, such considerations need to be balanced within a governance framework. We will introduce some recommendations related to governance in the last section of the paper.

### *Balancing Cost and Sustainability*

The key question facing commercial actors engaging in the creation and provision of FIPP systems is, what is the necessary and desirable level of information that can be provided at a reasonable cost? Producers and retailers are interested in participating in FIPP systems because

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safety. The FDA may not currently have the capacity or resources to make this mandate work. A danger exists that such systems will be seen as purely or mostly revenue raising mechanisms, charging large registration fees for entry, with little real oversight exercised. For this reason, it is important to stress the need for broad participation in, and ownership of, any governance structure.

### *Balancing Privacy and Access to Information*

The second dilemma is how to balance individual and commercial privacy with appropriate and broadly applicable open access to information. On the one hand, the promise of FIPP lies in the ability of such systems to provide, in theory, open and seamless access to a wide range of data. As the discussion of our “I-Choose” ideal type shows, Ellen is reliant upon broad participation from other consumers, companies and NGOs in her decision-making process. Technological social media integration must be balanced by broad participation from individual consumers and NGOs if the system is to be successful.

Broad participation is a key factor to the success of an I-Choose project. Small and medium enterprise formation (SMEs), small developers, and other groups may lack expertise and need support to participate in the scheme, while producers and suppliers with fewer resources may have little access to the Internet or technology. Current use of information systems and technologies varies in an important way not only across FIPP networks, but also among members of the network. For instance, coffee cooperatives’ traceability systems of organic and fair trade coffee are very carefully designed paper-based systems, while retailers like Walmart are heavily investing in advanced hardware and sophisticated information systems. Any governance mechanism would need to incentivize producers and suppliers with fewer resources to act collectively in order to overcome these difficulties. One important suggestion was that any governance system should incorporate the promotion and facilitation of collective agreements between organizations with different levels of resources that are participating in the same FIPP system, setting out clear and equal relationships between the parties.

One further barrier to access is the ability of consumers to access information in their own language. Any governance system should consider the need to promote crowd-sourced

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by salmonella (Schmidt 2007). Walmart and other retailers have pushed their importers to sign contracts to guarantee that their products are not contaminated (Barrionuevo 2007). Moreover, restrictions on importing products into the United States are increasing over time (Eamich 2007). One of the most important aspects of regional economies is the development of their production chains. FIPP networks offer alternative organizational forms to promote local and regional development. Exploring and understanding FIPP practices offers an opportunity to explore policies to promote this kind of development.

Fair trade practices attract wealth to regions and localities, improving communication between producers and end consumers through interorganizational networks (Powell 1990). Additionally, FIPP practices constitute a production alternative with low environmental impact because of their organic and social practices.

Information and Communication Technology (ICT) provides tools to facilitate and promote the development of these kinds of production and distribution chains. Technological capabilities of the Internet, together with traceability technologies, allow the producer to communicate relevant information about its product, adding value to the consumer by providing information that is not traditionally shared through market mechanisms. Current ICT has the potential to improve the necessary relationships in the networked environments inherent in FIPP systems (Papazoglou and Ribbers 2006).

On the other hand, FIPP networks recognize the importance of the locality and the region as natural places to promote economic development in the global world, integrating localities into the information society. In this society, competing for a place in the global network leads to a space in which cities and regions interact in the search for development (Catells 1996). While there are many reasons why government already does intervene and may intervene in the future, our research to date focuses on information-intensive strategies as they relate to trust development and information asymmetries.

We envision an iterative approach for developing and technically implementing the data sharing standards, as shown in Figure 4 below.

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providing, handling, and using product data. It would be regularly updated with input from stakeholders, consumers, and regulators. Companies, NGOs, or government bodies could be certified under this ISO if they consistently meet the requirements for peer and consumer review. Evidence from scholars of global policy suggests that ISO standards, such as ISO 9000, are popular with companies as means to differentiate themselves in the marketplace, and seen as both flexible and fairly objective.

Within the framework of the virtual ISO, companies could nominate key substantive parameters and set benchmarks against them. Participating companies would be free to use the aggregate information in their product marketing, creating their own labels and so on, but under advisement from the NATC and guidelines established through the ISO. Results of peer review would become incorporated into future versions of the ISO. This is not a pipe dream—elements of this system are currently being implemented in several other countries. France, for example, is carrying out a traceability experiment involving sustainable benchmarking by 160 companies (Barroux 2011). The European Commission is watching this experiment carefully in order to inform its own policy choices.

This peer review process would be matched by consumer review. Information from participating consumers acting in social networks—such as product and company reviews, or location information enabling better supply chain mapping—could contribute to the evidence base for future versions of the ISO and for benchmarking exercises. Consumers could opt to comment on and review products, producers, and other suppliers. They would benefit by seeing what others have recommended and use this to assist their purchasing choices. Companies, on the other hand, would gain the opportunity to “test” the sustainability of their products among participating consumers and create better connections. NGOs could submit information into the system about certification, inspection, and production practices. Reviews and reports would be verified and ranked by other participants. Consumers who submitted highly ranked product reviews consistently would become “consumer champions.” Results from consumer comments could be aggregated and accessed by all participants. Significant consumer concerns would be addressed through the peer review process.

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