

# Procurement models in the agricultural supply chain: A case study of online coffee auctions in India

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## Abstract

During the past few years, several innovative IT-based applications have emerged around the world that promise to bridge the proverbial “digital divide” by linking growers directly to domestic and international markets through the Internet. Online commodity auctions are an example of such initiatives and have the potential to impact the livelihood of millions around the world. However, an important factor that affects the benefits obtained by growers is the supply chain structure that results from the introduction of the online platform. In this paper, we provide a case study of an online coffee auction established in India for selling various grades of coffee beans. The focus of the case study is on the supply chain structure that is likely to evolve under various product and supplier characteristics. We argue that the online direct selling of commodities by growers is likely to evolve only under a certain set of conditions. We also argue that governments and platform providers can facilitate online direct selling by growers through initiatives that increase the bargaining power of the growers and increase the confidence of the buyer to directly procure from lesser known growers.

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## 1. Introduction

In many parts of the developing world, the proverbial “digital divide” is of grave concern to governments, developmental agencies, economists and others concerned with the growing income inequality between the rural poor and the urban rich in these nations. There is accumulating evidence in the trade literature of a global divide between the developed and the developing world, as well as a social divide between the rich and poor within the same society [37]. It is often argued that ubiquitous information technology (IT), the Internet and globalization have led to significant income increases for the urban rich, while the vast

majority of the rural population in developing countries remains mired in abject poverty [6].

At the same time, the Internet is often viewed as the means to reduce income disparities between the urban and rural populations in the developing world [5,42]. Consequently, numerous innovative IT-based applications have emerged around the world that promise to bridge the digital divide. Such applications include the e-Choupal Project in India that is used by farmers to sell wheat and soybean directly to commodity exporters through Internet kiosks placed in several thousand villages [49], online cooperatives of artisans in Latin America to sell products to end consumers around the world [3], and online coffee auctions in Brazil [45]. The purpose of these initiatives is to transform the agricultural supply chain by linking the rural communities to the Internet, providing producers with access to the international markets, reducing unfair trading practices and eliminating intermediaries who often absorb a significant portion of the producers’ margins.

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Auctions to buy and sell agricultural commodities are an important part of the agricultural supply chain in many regions of the world [13,23,33]. In recent years, agricultural auctions have been experimenting with online formats, where the physical auction environment is imitated in an online setting. The projected benefits of the online environment include lower transaction costs for buyers and sellers, daily operations, better price and product information, less collusion among buyers, fewer intermediaries, and a more streamlined agricultural supply chain.

While online commodity auctions and other Internet-enabled commodity procurement methods have the potential to affect the lives of millions of people who live on the other side of the digital divide, many are skeptical that the benefits actually reach the rural communities [6]. A series of recent articles in *The Economist* that analyze the impact of the digital divide argues that access to mobile phones and basic infrastructure is more important than access to the Internet [4,7]. On the other hand, others have argued that access to the Internet can lead to the integration of global labor markets, provide farmers with direct access to international markets, and reduce income disparities [42]. An important factor that affects the benefits obtained by farmers from the online platform is the commodity supply chain structure that results from the introduction of Internet enabled commodity procurement methods. Intuitively, direct procurement from farmers through the online platform results in the elimination of intermediaries and consequently, higher prices for producers [3,49]. However, it is not entirely clear whether direct procurement is the dominant procurement model that will result from the online platform.

In this paper, we provide a case study of a recently setup online auction in India for trading various grades of coffee. The focus of the case study is on the alternative supply chain structures that result from the introduction of the online auction. The electronic auction is operated by the International Business Division of ITC Limited (ITC-IBD), a large conglomerate in India with annual revenue of approximately US\$2 billion. ITC-IBD procures agricultural commodities from the commodity markets in India and sells to several international customers. The online coffee auction described here is part of a major initiative, popularly known as e-Choupals, by ITC Limited to transform the agricultural supply chain in India and reach the rural masses through computer kiosks located in several thousand villages [49]. The e-Choupal initiative was originally focused on wheat and soybean farmers and the online coffee auction is part of its new growth phase.

The online coffee auction mimics an existing physical auction held weekly by the Indian Coffee Traders Association (ICTA) in the southern city of Bangalore in India. Buyers, who are typically commodity exporters that sell coffee in bulk to the international trading houses, have several alternatives in procuring coffee from the planters,

such as through intermediaries, at the physical ICTA auction, or through the online coffee trading platform described here. We describe these procurement models later in the paper.

The case study presented here is focused on three important but related research questions that arise in the context of online commodity supply chains. First, it is well recognized in the information systems (IS) literature that the introduction of an electronic trading platform influences the industry structure, the supply chain, and the participants in ways that are often unpredictable [36,41]. We identify and analyze four different procurement models for commodity exporters that result from the introduction of the online auction platform. Each of these models has its advantages and disadvantages and some include the services of intermediaries. Using the *process-stakeholder approach* to analyzing exchange transactions [32], we describe the benefits to buyers and sellers under each procurement model. Second, we identify the conditions under which each procurement model is likely to evolve as the preferred model for commodity exporters. We focus on characteristics of the commodity that affect the choice of the preferred model. By doing so, we provide insights on the types of commodities that are likely to be procured using each of the four models. Third, we focus on the role of governmental agencies and platform providers in bridging the digital divide and ensuring that the benefits actually reach the producers.

The case study approach provides several benefits in studying the emerging online commodity procurement platforms. The findings from the case study can be used to form the basis for more sophisticated models and empirical analysis. Further, the flexibility of the case study approach is particularly well suited to emerging areas of research where well-established theories and a-priori hypotheses do not exist. It allows us to analyze what we observe, draw conclusions and develop frameworks that emerge from the data and observations.

The rest of the paper is organized as follows. In Section 1.1, we provide a brief literature review and a summary of the contributions of this research. In Section 2, we describe the research process we follow in conducting the case study. In Section 3, we describe the coffee supply chain in India and the market conditions prevailing at the time of the case study. In Section 4, we describe the online and physical ICTA auction formats. We also describe the four procurement models that result from the introduction of the online format. We also summarize the results of an earlier empirical analysis that compares the price of coffee sold through the online and physical auction formats [14]. In Section 5, we discuss the benefits of the four procurement models to buyers and sellers and then utilize this comparison to predict the dominant procurement model that is likely to evolve under different product and seller characteristics. Section 6 concludes the paper, discusses the role of governmental agencies, and outlines areas of future research.

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