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THE NEW E-ECONOMY: A LOOK AT TRANSACTION COST ANALYSIS IN THE ELECTRONIC MARKETPLACE

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Abstract

The focus of this research stream is to explore the development of what has been called the “new economy” and the emergence of new market structures brought about by electronic business. This paper investigates the impact of e-commerce on transaction cost analysis in the context of economic and organizational design theory. We review elements from both disciplines to create models of the new e-economy and propose methods to empirically examine the extent to which these models mirror reality. In this paper, we establish foundational research to address the following questions: How are markets and firms related in the new e-economy? What forms of governance (markets, hierarchies, or intermediary structures) maximize transaction efficiencies (minimize transaction costs)? What impact does increasing levels of IT investment have on transaction costs? As the new e-economy approaches a state of perfect information (perfect competition), what is the impact on transactions and related costs? What theories are supported or challenged by these findings?

Keywords: Transaction costs; E-commerce; digital economy; Internet economy; marketplace

Introduction

Economists and organizational theorists alike have attempted to answer to the question, “Why do firms (term used by economists) or organizations (used by organizational theorists) exist?” Many individuals since the publication of Adam Smith’s *Wealth of Nations* have attempted to answer this question and formalize the conditions under which the “invisible hand” operates. Much of the research in this area has been classified under the theory of the firm. However, the main focus of this theory is on the structure and operation of markets without explaining the existence of firms.

Coase (1937) formulated the foundational answer to this question while he was a student at the London School of Economics. In his article, “The Nature of the Firm”, Coase proposed that the reason organizations exist is that sometimes the cost of managing economic exchanges across markets is greater than the cost of managing exchanges within the boundaries of an organization. Coase’s answer placed transaction costs at the center of analysis of understanding why firms exist and suggested that markets and organizations are alternatives for managing the same transactions. From Coase’s work came Williamson’s development of a more complex model of the costs of using a market to manage economic exchanges (Williamson 1975). This work is what we commonly refer to as transaction cost analysis.

Transaction costs analysis (TCA) has received much attention in academic research and has been employed under various economic conditions since its inception by Coase. Classical and neo-classical economic theory, beginning with Adam Smith, point to the amazing ability of markets to coordinate economic production and exchange at very low cost and without government planning. As markets transition from brick and mortar to electronic marketplaces, transactions costs are at the center of defining market mechanisms at work.

In this paper, we consider transaction costs in the “new economy” and the emergence of new market structures brought about by electronic business. This paper investigates the impact of e-commerce on transaction cost economics in the context of economic and organizational design theory. We begin by addressing the following research questions:

1. How are markets and firms related in the new e-economy?
2. What forms of governance (markets, hierarchies, or intermediary structures) maximize transaction efficiencies (minimize transaction costs)?
3. What impact does increasing levels of electronic commerce (as measured by increasing levels of IT investment) have on transaction costs?
4. How is the distribution of information impacted by e-commerce? If asymmetries exist, what competitive advantages are created?
5. What theories are supported or challenged by these findings?

This research contributes to the existing body of knowledge by establishing a research stream to study the evolution and integration of organization and economic theory brought about by a new economy. This paper is divided into four sections: the first presents a discussion of the transaction cost approach to the theory of the firm; the second provides an overview of the development of the electronic marketplace through e-commerce; the third presents hypotheses to be tested; the fourth concludes with proposed methodologies to continue this research.

The Transaction Cost Approach to the Theory of the Firm

A firm is a system of long-term contracts that emerge when short-term contracts are unsatisfactory. The unsuitability of short-term contracts arise from the costs of collecting information and the costs of negotiating contracts.
(Coase 1937)

Coase noted that there are inconveniences in market transactions. If transactions are not governed by the price system, there has to be an organization. The object of a business organization is to reproduce the conditions of a competitive market for the factors of production within the firm at a lower cost than the actual market. But if an organization exists to reduce costs then why are there market transactions at all? Coase gave two reasons:

1. The costs of organizing additional transactions rise with scale and are equated with the costs of additional market transactions;
2. The organization of bigger firms may not reproduce the effects of market conditions (Watkins 2001).

In his article "The Problem of Social Cost", Coase defines the transaction costs of concern as

1. search and information costs
2. bargaining and decision costs
3. policing and enforcement costs (Watkins 2001)

Coase contends that, without taking into account transaction costs, it is impossible to properly understand the workings of the economic system and have a sound basis for establishing economic policy.

Complexity and Uncertainty

Coase and Williamson present markets and hierarchies (organizations) as alternative instruments for completing a set of transactions (Williamson 1975). As transaction instruments, markets and hierarchies are called 'governance mechanisms' (Barney and Hesterly 1996). Market forms of governance rely on prices, competition, and contracts to keep all parties to an exchange informed regarding their rights and responsibilities. Hierarchical forms of governance bring exchange parties under the control of a third party (typically the "boss"). Under transaction cost analysis, economic actors will choose that form of governance that reduces any potential exchange problems at the lowest possible cost. Transaction cost analysis identifies exchange problems as opportunism (efforts to mislead or otherwise confuse exchange partners to promote self-interests) and bounded rationality (the

natural limitations of individuals as information processors) (Scott 1992). The governance of economic transactions is costly. However, *ceteris paribus*, transaction costs escalate when exchanges become more complex and, to the economic actors, more uncertain.

Autonomous Adaptation and Purposive Adaptation

Ghoshal and Moran (1996) add another perspective in their comparison of market and firm governances. Their work compares market logic to organizational logic as they relate the concept of autonomous adaptation to purposive adaptation. Hayek (1945) describes autonomous adaptation as the process where firms adapt autonomously in response to market signals as the available supply of goods and services is cleared with current demand. Ghoshal and Moran (1996) describe this process as one that “unfolds...without any concern for the direction it takes or for its future states.”

According to Ghoshal and Morgan, organizations are capable of purposive adaptation. Barnard (1938) defines shared purpose as the “unifying element” of formal organization. Williamson (1991) states that it is purpose that allows what is called “coordinated adaptation” to move toward some direction and to do so by exercising judgment in deciding which market signals to respond to and which to ignore.

Based on the above research, autonomous adaptation (market response) is inferior to purposive adaptation (organization response) for three reasons. First, prices must be known or predictable for the “marvel of the market” to work efficiently (Simon 1991). According to Williamson (1991), prices serve as statistics for transactions to adapt autonomously. However, in the absence of meaningful prices, autonomous adaptation may be costly or even impossible. Purposive adaptation is possible even in the absence of prices. Secondly, autonomous adaptation is biased towards static efficiency (directs resources away from the less efficient and towards the more efficient uses). Purposive adaptation allows organizations to pursue dynamic efficiency, which creates new options and expands the scope of activities beyond those that markets alone can coordinate efficiently. Shared purpose transforms the institutional context in which relations are embedded, thereby influencing the behaviors and preferences of actors. “Autonomous” adaptation, is just that—autonomous—encouraging actors to pursue self-interests under the natural restraint of unfettered competition.

Summary

Adam Smith and others suggest that markets have lower fixed costs compared to hierarchical forms of governance. However, it is commonly believed that high levels of uncertainty and complexity in exchanges encourage individuals to move transactions out of markets and into organizations. As expressed by Barney and Hesterly (1992), if market governance does not solve exchange problems, then more costly forms of hierarchical governance may have to be employed. According to Arrow (1974), the price system, viewed as a mechanism for the efficient allocation of personnel and resources to production tasks, fails when confronted with very complex relations among these factors or with uncertainty concerning future conditions. As such complexity and uncertainty increases, more information needs to be processed in order for contracts to be negotiated and transactions conducted. From this view, we would conclude that organizations are superior to markets in managing complex and uncertain economic transactions because they reduce the costs of such transactions. However, according to Adam Smith, markets are governed by an invisible hand that coordinates market activity. Williamson and others support the observation that markets handle transactions through autonomous adaptation. With increasing uncertainty and complexity in transactions, we propose that market structures have changed to create a new marketplace, a new economy.

The Transformation of Markets

Few innovations in human history encompass as many potential benefits as E-Commerce does. The global nature of the technology, the opportunity to reach hundreds of millions of people, its interactive nature, the variety of possibilities for its use, as well as the resourcefulness and rapid growth of its supporting infrastructures, especially the Web, will result in many potential benefits to organizations, individuals, and society. These benefits are just starting to materialize, but they will increase significantly as EC expands. It is not surprising that some maintain that the EC revolution is just “as profound as the change that came with the industrial revolution.” (Clinton and Gore 1997) (Turban et al 2002)

The digital economy, also known as the Internet economy, the Web economy, or “new” economy, refers to an economy that is based mainly on digital technologies, including digital communication networks (Internet, intranets, etc.), computers, software, and other related information technologies. Digital networking and communication structures provide a global platform to interact, communicate, collaborate, and exchange.

The term “digital economy” refers to the convergence of computing and communication technologies through the Internet and the resulting flow of information and technology that is stimulating electronic commerce (EC) and spurring vast organizational changes. The digital economy has created an economic revolution that is evidenced in the United States by the longest period of uninterrupted economic expansion in history (Turban 2002).

According to Bakos (1998), markets (electronic or otherwise) play a central role in the economy. Markets have three main functions: 1) matching buyers and sellers; 2) facilitating the exchange of information, goods, services, and payments associated with market transactions; and 3) providing an institutional infrastructure that enables the efficient functioning of the market. According to Turban, markets have seen a dramatic increase in the role of information technology (IT) and EC. EC was successful in increasing market efficiencies by expediting and improving market functions including exchanges between businesses (B2B) and between businesses and consumers (B2C). Furthermore, EC was able to significantly decrease the cost of executing these functions.

The emergence of electronic marketplaces, called *marketspaces*, especially Internet-based *marketspaces*, changed several processes used in trading and in supply chains (Turban 2000). Similar to a marketplace, in the *marketspace* sellers and buyers exchange goods and services for money, but they do so electronically (Hanappi and Rysavy 1998). These changes, driven by IT, have resulted in even greater economic efficiencies. EC leverages IT with increased effectiveness and lowers transaction and distribution costs, leading to more efficient, problem-free markets.

The availability of reliable, low cost communications via the Internet is providing new modeling challenges in many industries. The emergence of new global competitors, the convergence of high technology industries, and the increasing speed and cost of technological development promise an increasingly uncertain environment for traditional firms (Hagedoorn and Schakenraad 1994). These dynamic competitive forces call for organizations to be efficient, innovative, and flexible (Duncan 1976). This is particularly true in fast-paced industries or hyper-competitive environments characterized by rapid technological change, shortened product life cycles, increasing competitive rivalry, and global competition (Volberda 1996).

According to Barney, technology may simplify some transactions to the point at which they no longer need to be conducted within a hierarchy, but can be governed through market mechanisms, thereby changing the efficient boundary of the firm (Barney and Ouchi 1986). The new economy has created new economic rules. Products, industry, and sellers and buyers’ characteristics are different in e-commerce. According to Turban, the production function and transaction and administrative costs are much better in e-commerce, and there is no need to be a large organization to achieve economies of scale. The major concern of many firms today is how to transform themselves in order to take part in this digital economy. If the transformation is successfully completed, many organizations will reach a status where the Internet, intranets, and extranets are integrated in a manner to conduct numerous exchanges now managed within organizations.

Arrow and Williamson conclude that organizations are superior to markets in managing complex and uncertain economic transactions because they reduce the costs of such transactions. However, though autonomous adaptation, markets can encompass organizations and adjust for complexities and uncertainties in economic transactions, thereby reducing the costs of such transactions.

Hypotheses

We propose that markets encompass organizations and business structures and automatically adjust for complexities and uncertainties in economic transactions, thereby reducing the cost of transactions. With this, we present our first hypotheses:

- Hypothesis 1: Transactions conducted through electronic business (distribution) channels are lower in cost than those conducted through traditional business (distribution) channels.

According to Williamson, as complexity and uncertainty increases, more information needs to be processed in order for contracts to be negotiated and transactions conducted. We therefore propose that,

Hypothesis 2: Electronic business (distribution) channels transmit more information than traditional business (distribution) channels.

Hypothesis 3: As complexity and uncertainty increases, more information is transmitted over electronic business channels.

Economic actors will choose that form of governance that reduces any potential exchange problems at the lowest possible cost. Market governance under electronic business allows exchanges with minimum problems at the lowest possible cost. From this we present the next two hypotheses:

Hypothesis 4: Market efficiency is positively related to the concentration of e-commerce activity as measured by the concentration of IT.

Hypothesis 5: Transaction costs decrease with increasing levels of e-commerce as measured by increasing levels of IT investment.

Proposed Methodology

A review of prior literature reveals a variety of research methods used to evaluate transaction cost analysis as well as the impact of levels of investment in IT. Barua, Kriebel, and Mukhopadhyay (1995) propose both analytical and empirical methodologies that would support an evaluation of optimum levels of IT investment. These authors employ a microeconomic paradigm of a production function that relates physical input resources with output products or services. This theory yields the concepts of marginal product and marginal product, where the latter represents the gross value added of an input resource or process to the firm's output. Using this theory we can identify the value added by changing levels of IT investment to pertinent intermediate and higher market level variables.

Utilizing models drawn from transaction cost economics and organizational design theory, we will continue this study by analyzing economic variables to evaluate the hypotheses presented. We propose to operationalize the constructs and other variables needed to evaluate and test the validity of the above hypotheses. We will also develop models using econometric and other methods to test the hypotheses presented.

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