

TRANSACTION COSTS, TRUST, AND THE STRUCTURING OF MARKETS

Paul L. Robertson
Australian Innovation Research Centre
University of Tasmania
plr090634@hotmail.com

TRANSACTION COSTS, TRUST, AND THE STRUCTURING OF MARKETS

ABSTRACT

This article examines the institutional arrangements that develop when the risks of opportunism and other contributors to transaction costs are high but transactions are nevertheless necessary for economic efficiency. Williamson's famous distinction between markets and hierarchies is inadequate because under certain circumstances markets may be hierarchies that are deliberately managed to reduce levels of transaction costs and undertake strategic objectives to improve their competitiveness with other hierarchies, including other markets. As transaction costs are production costs for these markets, careful management increases the efficiency of the markets. As a result, some important markets are also hierarchies that are structured in ways that are analogous to firms precisely in order to reduce their costs of operation, including the transaction costs that arise from using them.

The empirical focus of the article is on the evolution of the membership rules of stock exchanges, a select but important group of markets that have been consciously constructed over long periods and with frequent modifications because of environmental change and learning by participants. Stock exchanges belong to a category that also includes insurance exchanges such as Lloyd's, and various markets involving shipping and world trade. These are markets in which the use of up-to-date information is especially important because conditions may alter quickly and in which risk, uncertainty, and the potential for opportunistic behaviour are factors that affect their operations in significant ways. Their productivity as markets is (or historically has been) so high that their replacement by hierarchies is virtually unthinkable because they allow for exchanges that could not otherwise be accomplished smoothly. As a result, when transaction and agency costs arise in such markets, responses have concentrated on finding mechanisms for reducing them to tolerable

levels rather than on abandoning transactions altogether through the internalization of activities.

Introduction

The boundaries of firms and markets are inextricably related. The exact location of the boundaries of firms, that delineate the activities undertaken internally, are often attributed to “market failure” – to inefficiencies and other “frictions” that make markets expensive to use and therefore induce firms to produce goods and services internally that they might otherwise purchase in markets. In this formulation, markets are actually given the starring role even though attention usually focuses on firms because economists tend to view market transactions as more natural in some sense than the internalization of activities that might otherwise be purchased. In his seminal 1937 article on transaction costs, Ronald Coase offers a quotation from Sir Arthur Salter as a typical economist’s view of the way in which market economies function (Coase, 1937; 387):¹

The normal economic system works itself. For its current operation it is under no central control, it needs no central survey. Over the whole range of human activity and human need, supply is adjusted to demand, and production to consumption by a process that is automatic, elastic and responsive.

In other words, the price system operating through markets provides all of the coordination necessary for an economy to operate as near to optimally as makes no practical difference. While firms may benefit through narrow specialization in a Smithian sense, they are unlikely to benefit from vertical integration as long as markets are frictionless (that is, costless to use). Moreover, adding activities may be increase production costs since it is hard to be a master of all trades. To explain the contrast between this picture of simplicity and the real-world existence of vertically-integrated firms with complicated organizational structures,

modern economists generally invoke the presence of transaction costs to demonstrate how market failure may drive firms to broaden their scope of activities.

The converse of the argument is that the presence of markets with relatively low transaction costs will discourage vertical integration. Furthermore, the extent of vertical integration can be expected to vary as transaction costs rise and fall (Langlois, 1992). Therefore, at least in this formulation, both the boundaries of firms (the range of activities that they undertake) and the boundaries of markets (the range of activities undertaken *and* the cast of players) are primarily determined by the costs of using markets rather than by the productive efficiency of firms.

But this is far from the whole story because markets are far from uniform. In fact, modern “market economies” embrace a wide range of institutions for exchanging ownership of goods and services. The types of transactions undertaken are not only varied, but some important markets are also hierarchies that are structured in ways that are analogous to firms precisely in order to reduce their costs of operation, including the transaction costs that arise from using them.

In this article, I look at the evolution of a select but important group of markets that have been consciously constructed, albeit over long periods and with frequent modifications because of environmental change and learning by participants. These include stock exchanges, insurance exchanges such as Lloyd’s, and various markets involving shipping and world trade, markets in which the use of up-to-date information is especially important because conditions may alter quickly and in which risk, uncertainty, and the potential for opportunistic behavior are factors that affect their operations in significant ways. Their productivity as markets is (or historically has been) so high that their replacement by hierarchies is virtually unthinkable because they allow for exchanges that could not otherwise

be accomplished smoothly. As a result, when transaction and agency costs arise in such markets, responses have concentrated on finding mechanisms for reducing them to tolerable levels rather than on abandoning transactions altogether through the internalization of activities.

In the first section, I try to define what a market is, a problem that turns out to be surprisingly elusive. The second section investigates the sorts of factors that may affect the smooth operations of the types of markets under consideration by examining both production costs and transactions costs of various types. In the third section, the analysis is applied to the development of stock exchanges in English-speaking countries since the seventeenth century to demonstrate how they have been constructed with relatively confined boundaries in order to restrict transaction and agency costs, improve their internal efficiency, and provide ways of coping with inherent uncertainty as well as risk. The concluding section applies some observations made in the earlier discussion to broader questions concerning transaction costs and the boundaries of firms and markets.

1. Markets and The Market

Although “markets” lie at the core of modern economies as well as underpinning neoclassical economic theory, in practice they have such a wide range of characteristics that, to use a biological analogy, in their level of diversity they are closer to a genus, or even a family or an order, than to a species.

In its most general sense, a market (or The Market) is an ideal type, a consciously chosen selection of characteristics that have been logically configured by economists to examine how the price system functions.² Although perfectly competitive markets lie at the heart of the analysis, variations based on more limited forms of competition (monopoly, duopoly, oligopoly, etc.) have also been dissected and evaluated by economists. The

importance of The Market is not its realism since it is doubtful if perfect competition has often prevailed in the real world, but that the analysis provides a series of benchmarks against which the performance of other market structures may be judged. For example, Caves (1964; 15) contends that “Market structure is important because it determines the behavior of firms in the industry, and that behavior in turn determines the quality of the industry’s performance.” On examination, this leads to the conclusion that highly competitive markets with high levels of performance are superior, a deduction that Caves (1992; 15) defines as “our normative appraisal of the social quality of the allocation of resources that results from a market’s conduct”. As I discuss below, this analysis of The Market has contributed not only to a preference for high levels of competition, but also to the standards of behavior and performance that groups have tried to generate when constructing markets in order to reduce market failure.

This approach to markets has tended to squash consideration of markets and their alternatives in some areas where we might expect a strict and workable definition of markets to be essential. In a survey of microeconomics textbooks, for example, I found that markets are often not defined at all or, if they are, that the definitions provide little for students to ponder. In this, they are following Williamson (1975, 20) in contending that “in the beginning there were markets”. While Williamson notes that he is taking this position for “for expositional convenience”, however, some other authors do not seem to recognize that there is an issue at stake. Expositional convenience may well justify some cutting of corners, and it is clear that in many areas in modern capitalist economies the existence of markets is so common as to be virtually undebatable, but recent events in China, Eastern Europe, and parts of the former Soviet Union have demonstrated that the preconditions for the efficient operation of markets are not universally available and that conscious intervention may be necessary to build a market economy. Laws securing property rights, for example, are

constructs and by no means “natural” in the minds of people in many societies. (North, 2005; Greif, 2006)

Popular dictionaries of economics are not much better at capturing the meaning of “market”.³ The *Oxford Dictionary of Economics* (Black, 2002; 288) offers as a first definition that a market is “A place or institution in which buyers and sellers of a good or asset meet.” It asserts that “Markets facilitate trade in goods...; in securities...; in labour services...; or in foreign exchange...”, but does not discuss how this facilitation occurs. The second definition in the *Oxford Dictionary* refers to a market economy and in essence echoes the views of Caves on the benefits flowing from high degrees of competition. This definition notes that “An efficient market is one where prices reflect all available information about the good or asset concerned (289)” and lists a number of causes of market failure, but gives no indication of how market failure might be avoided and efficiency achieved. The *Collins Dictionary of Economics* (Pass *et al.*, 2005; 324) says that a market is “An exchange mechanism that brings together buyers and sellers of a PRODUCT, FACTOR OF PRODUCTION or FINANCIAL SECURITY (see TRANSACTION).” The definition notes a number of characteristics of markets and describes various types of competition, but (like the *Oxford Dictionary*) does not discuss how markets might operate in practice to achieve efficiency and high levels of competition.

The correct conclusion to be drawn from these definitions, which is not mentioned explicitly in any of the accounts, is that markets are by no means homogeneous entities, a point that Geroski (1998) also makes, although from a somewhat different angle. Geroski contends that markets are defined with three aims in mind. The first is to identify the characteristics necessary for an institution of exchange in which the law of one price prevails, what he terms “trading markets”. A second set of definitions addresses anti-trust concerns.

Finally, he concentrates on a third set of definitions, for “strategic markets”. These are essentially the groups of actual or potential customers that a firm targets when trying to sell a particular product.

This wide range of definitions does not undermine neo-classical analysis on the advantages of competition and market efficiency, but it does lead to a distinctly fuzzy picture of what goes on in a market economy. The most obvious consequence is in the area of competition policy because fuzziness seems to imply that, depending on circumstances, a number of types of markets might achieve acceptable levels of social welfare. Similarly, by not specifying what happens in a market beyond the basic statement that it is a place in which buyers and sellers exchange assets, such vague definitions beg the question of what sorts of regulation (including self-regulation) and other aspects of constructing and limiting the operations of markets might be considered to be appropriate.

Although economists may refer to The Market and the market economy, in practice there is a huge number of markets in a developed economy. Many of these markets do not have a distinct institutional or physical presence: Lemonade can be bought at a supermarket, a restaurant, or from a child sitting in front of her house. Nor is it necessarily true that a homogeneous product will be sold in a distinct market: The same airline ticket may be purchased from the airline, a travel agent, or online as part of a package tour. Does this imply that, as Geroski (1998) believes, a market’s boundaries are not inherent in the market itself but a subjective construct that can be varied as circumstances – and, more importantly, perceptions of circumstances – evolve? Is it even meaningful to speak of markets in such miscellaneous circumstances?

In contending that market boundaries are “something which we use to classify [the organization of economic activity] in our minds”, Geroski (1998, 689) may be somewhat

insouciant⁴ because he is trading on the linguistic confusion caused by the ambiguity of the word “market” in English. If one type of exchange activity or institution were termed X, another Y, and so on throughout the alphabet, much of the looseness surrounding the nature of “markets” would disappear. For example, setting the boundaries of trading markets, in which the law of one price is an important objective, may not be subject to a wide range of arbitrary considerations. Such markets may instead be highly focused specialized institutions which are sharply defined in terms of both their physical location (or locus of control and regulation) and the nearly homogeneous nature of goods traded. This sharpness of focus does, in fact, occur reasonably often, as a result of which there are markets for particular *classes* of good and services such as securities, marine insurance, and a wide variety of commodities. Some of these markets are centuries old, but others (markets for derivatives, for example) are of more recent origin. Moreover, the category has a realistic chance of growing in the future because various e-markets have many similar characteristics even though their operations are as geographically diffuse as conditions allow.

The distinguishing feature of these markets is not that they are specialized in terms of the items traded (because of strategic considerations of the type discussed by Geroski, some sell more than one type of product⁵), but that their operation is restricted to people who are willing to subscribe to a formal set of rules. In general, as is discussed in more detail in the next section, rules are needed to restrict transaction costs in cases in which internalization is not a plausible alternative to operating through a market.

To accomplish this, markets have been constructed quite consciously to provide the benefits that economists have dictated should exist in The Market but which are frequently missing from markets in the everyday world.⁶ In practice, markets do not have to offer free access to all comers to be highly competitive. All that is required is a sufficient number of

participants to allow prices to be set efficiently through competitive bidding. The main focus of the regulations that these markets have laid down and enforced has been on the frictions that are now termed transaction costs. In the process, these regulations have generated other kinds of transaction costs, but these are of a type that is often overlooked – barriers that enabled markets to function *more smoothly* than they would have if unregulated. The upshot has been that the “production costs” involved in using these markets (that is, in gaining the benefits that flow from making exchanges in markets rather than through other types of trading arrangements) have in general been reduced by managing transaction costs in a systematic way.

2. Why Construct Markets?

The factors that potentially influence the design of constructed markets depend on the institutional and physical environment in which each market operates and on the nature of the goods or services being traded. They can be divided into the traditional categories of production and transaction costs and, following Langlois (forthcoming), transaction costs can be further subdivided into fixed costs, costs that are a function of time, and costs that are a function of the number of exchanges or volume of trade undertaken. My argument is that, for constructed markets, many of the costs that are generally designated as transaction costs are actually production costs and that, far from being frictions, they contribute substantially to the efficiency of the markets in question.

Carlton (1984) contends that futures markets should be analyzed as if they were firms because they compete strategically with other markets. This is certainly true of many types of constructed markets, but the analogy with firms can be taken further to include the way in which they conduct their day-to-day operations. Another significant advantage that conscious structuring confers on markets is that it allows all types of operating costs to be

managed. This does not mean that the costs can be eliminated but that, under favorable circumstances, they may be reduced in various ways that conduce to greater efficiency in the operations of the markets. In Williamson's famous dichotomy (1975, 1985), exchanges may be dealt with through either markets or hierarchies. Other intermediate forms have since been promoted including strategic ventures and other forms of cooperation (Thompson, *et al.*, 1991). Coase (1960) has suggested (although hardly endorsed) the proposition that government regulation could be used to reduce transaction costs. The alternative discussed in this article is that the regulation of markets, although not necessarily by governments, can in fact be an important device for improving the efficiency of markets. In some significant cases, generally when constructed markets are owned and managed by their participants, *self-regulation* may be dominant. When they are deliberately limited both in their functions and in the number and characteristics of their players, constructed markets have an ability to shape their environments and outcomes that is not open to markets as traditionally conceived. But, as will be shown, regulation by outsiders such as governments or even private institutions may also shape rules that reduce opportunism and transaction costs.

As Coase (1993b [1988]) has emphasized, neither production costs nor transaction costs should be analyzed in isolation because it is their sum that provides the basis for deciding whether to use markets, hierarchies, or other organizational forms. The main purpose of a firm is to run a business – to produce goods or services for sale at a profit (Coase, 1993b [1988]); Langlois and Robertson, 1995). Similarly, the main purpose of a market is to allow transactions to be undertaken. Thus markets should be thought of as also having production costs unless one assumes that transactions somehow occur through some supernatural mechanism that does not require human effort or other inputs. In common with firms, markets may face a variety of costs, not all of which can be outsourced. For instance, a market may need a venue or marketplace (essentially the first definition of a market offered

up in the *Oxford Dictionary of Economics* (2002)). In some cases, this cost may be borne in a decentralized fashion, as when the market for new automobiles is spread around a number of individually-owned dealerships. In others, the cost can be shoved off onto others, as in the case of the “curbside exchange” that, before it evolved into the American Stock Exchange, met in the streets of New York. Likewise, the personnel needed to maintain a market may be deployed and paid for in a decentralized manner, or they may be employees of the market, or both. Finally, markets may need an initial fund of capital to get them started and keep them operating smoothly. This capital could be subscribed by participants in the market and administered centrally, or it might be supplied and administered by individual participants who, in effect, barter their money and services to provide a lubricant for part of a market’s operations in return for similar services provided by other participants. The choice of a structure to administer and distribute the costs of production differs from market to market depending on a host of factors such as the number of participants. Neither very large nor very small numbers, for example, could be expected to maintain distinct premises. Constructed markets can adopt rules and procedures that allow them to undertake these tasks efficiently while still maintaining their essential function of facilitating transactions.

A second possible reason for the construction of markets is the reduction in transaction costs that may derive from specialization. By trading in markets with limited scope, the types of efficiencies that Smith (1937 [1776]) noted in the early chapters of *The Wealth of Nations* may become available: Greater mental and physical adeptness, greater innovativeness, and better use of time. Because of their technical nature and significant reliance on up-to-date information, specialization can certainly improve the efficiency of many of these market, but the matter is not straight-forward. As a result, the scope of markets that are seemingly dealing in the same goods may differ substantially. In part, this is because of economies of scope since hard-to-acquire technical knowledge that is relevant to

one field may also apply to others, encouraging people with rare skills to diversify their activities if they have spare resources (Penrose, 1959).⁷ In other words, the division of labor is limited by the extent of the market. But there may be more involved as there is no reason to think that there is always a complete correspondence between the division of labor among markets and the degree of specialization of the people who use those markets. A market that is substantial enough to be highly specialized in terms of the products traded may nevertheless absorb only a fraction of the time of the buyers and sellers who participate. As I show below, for instance, in their early days stock exchanges often handled only a portion of the activities of many of their members, who were as a result obliged to “saunter” in the course of their work. Thus it is reasonable to expect that the costs of sauntering would be balanced against the advantages that arise from market specialization.⁸

An additional justification for limiting numbers, one that economists are guaranteed to mention, is that structured and regulated markets may be used to drive up profits by curtailing competition. This obviously is a possibility in the specialized markets under discussion here, but there are limits to how severely competition can be limited when the purpose of the market is to generate conditions that approximate those of The Market. If an efficient market is one in which all participants have access to prices that convey “all available information about the good or asset concerned” (Black, 2002, 289; Bernstein, 1992; Lo, 1997), then there must be enough buyers and sellers to insure that the prices are determined through a process involving a fairly high degree of competition. On the other hand, bounded rationality must be restricted as far as possible because all participants need to be fully up-to-date on prices and the underlying information that they reflect. In practice, this may place limits on how large the markets can be. If it is not overdone, therefore, limiting the size of markets can increase their efficiency. The prospect of competition is reinforced by the possible existence of other markets whose members trade in the same class of assets (Carlton, 1984). In a

number of cases, as in insurance and securities, multiple markets have been in competition, offering lower charges or additional services to attract customers.

Limitations on size can also be necessary to keep the level of transaction costs within bounds. But, as has already been noted, some of the most often cited types of transaction costs are more accurately regarded as production costs. In real markets certain kinds of behavior that generate transaction costs are necessary because, in their absence, there can be no transactions (Campbell and Harris, 1993; Macneil, 1981 and 1982). These costs result from what Nooteboom (2002) calls “enabling constraints”. As Campbell and Harris (1993, 178) put it,

The negotiating, information gathering, organizing, and so on within which transactions take place are not *only* costs, they are also the social relations which are essentially facilitative of the transaction. All actions, including all transactions, can take place only within a constitutive social system. If one really took away *all* the costs of exchanging, the exchange would not take place cost-free. It simply would not take place at all (emphases in original).

Macneil (1981, 1022) goes further by contending that,

Because it is impossible to conduct exchange without transaction costs, and since they are variable, they are as much a factor of production as are capital and labor.⁹

Together, these comments justify Arrow’s conclusion¹⁰ that transaction costs are the “costs of running the economic system”. As all firms in a capitalist economy sooner or later need to confront markets, internalizing transactions can only be a postponement of the inevitable.¹¹ As an alternative to internalization of activities, firms may adopt a program of reducing transaction costs, for example by encouraging the establishment of several suppliers

of a particular input to reduce the likelihood of hold-up. Although neoclassical economists have tended to ignore transaction costs, from the point of view of a firm these are not particularly mysterious and are more likely to be thought of as a normal cost of doing business.

The correspondence between production and transaction costs is clear for constructed markets whose product is transactions. The managers of these markets have great incentive to reduce transaction costs by regulating and monitoring (i.e. managing) both *ex ante* and *ex post* activity. As far as possible, they need to reduce the impact of bounded rationality in order to increase market efficiency, but also to reduce opportunistic activity and to limit risk and curtail the effects of uncertainty as markets will not function adequately if the risk of default is excessive.¹²

In the past quarter century, opportunism has occupied a central place in discussions of transaction costs (Williamson, 1985). Because of asymmetric distributions of knowledge, some market participants may be able to turn transactions to their advantage if they are willing to engage in “self-interest seeking with guile” (Williamson, 1993, 458). One way of dealing with this, which is emphasized by Williamson (1975 and 1985), is to withdraw from markets and keep activities in-house where they can be supervised more closely, but in other cases it is possible to reduce opportunism to levels that still allow transactions to take place profitably.¹³ As eliminating transaction costs also incurs costs (Langlois, forthcoming), it is again necessary to find the best balance of total costs.

One way of reducing opportunism is to deal only with people who are regarded as unlikely to act with guile. Unfortunately, such people are not always easy to identify, especially since past behavior, even if known, may not be a good indicator of future behavior, which is what parties to a transaction really need to know. Two broad strategies, neither of which is fool-proof, can be followed in attempts to avoid having to do business with bad

trading partners. The first is to achieve an alignment of interests such that non-opportunistic behavior by both parties will lead to win-win outcomes while opportunism on the part of either party generates lose-lose outcomes. Transaction costs are therefore reduced since all participants know that both they and other parties will avoid opportunistic activities for fear of being penalized while non-opportunistic behavior leads to rewards all round. An alignment of interests can be achieved in a number of ways, including the use of formal or informal contracts that specify performance levels and their associated positive and negative payoffs.

As contracts can be expensive to draw up and enforce, however, other means of aligning interests may be superior. One alternative means is to deal as far as possible with others whose success is to some extent directly related to one's own, for example family members. When a substantial proportion of assets is held jointly, it is in the interests of each party that others should thrive.¹⁴ But reliance on relatives can be excessively confining. Not only is there no guarantee that a relative with the proper assets can be found to take the other side of a transaction, but, no matter how well aligned their interests, family members may not be as skilled or intelligent as outsiders, and the sum of a family's assets may be inadequate for some deals.¹⁵

As a result, other sorting devices may be needed to reduce the risk of opportunism. This brings up questions of trust, an issue that has received uneven attention. Ordinary usage suggests that "trust" comes in a number of varieties and degrees of strength. Thus we might trust someone with our lives whom we would not trust to make a good cup of coffee. Williamson (1993) has introduced another criterion by claiming that trust should not be calculative but rather equated with "blind trust", that is with believing that another person will behave in our best interests solely on the basis of some heuristic (motherly love, perhaps)

rather than from a strict and thorough examination of the person's background, capabilities, or other characteristics that are relevant to their motives and ultimate performance. Once we exhibit calculativeness by consciously weighing up the factors involved in another's performance and assessing the risks involved in a relationship, Williamson claims that trust is no longer involved.¹⁶ Other commentators (Nooteboom, 2000 and 2002; Lindenberg, 2000) have contested Williamson's argument and considerably illuminated the issues in question. Here, I accept the thrust of Williamson's point that calculativeness is often involved in assessing relationships with others but deny that this undermines trust as a way of reducing transaction costs. Indeed, Williamson's claim sidesteps the main point, which is to determine how information can be used to reduce transaction costs. Seabright (2004, 64) captures the right tone when he claims that,

when I say I can trust a stranger, I do not mean that I like him, have any curiosity about him as a person, or care in any deep sense about what happens to him.

The point is that I do not need to like or care about him in order to be able to deal confidently and reliably with him.¹⁷

Naturally, if we know that people with whom we want to do business will not cheat us because they are pure of heart, then transaction costs will be reduced because there is no longer a risk of opportunism.¹⁸ But how can we confidently decide if a person can be dealt with reliably? A number of techniques may be used, although none totally eliminates risk in the face of inherent uncertainty.

A useful way of proceeding, which is known in many societies,¹⁹ may be to deal as far as possible with the members of one's peer groups, for instance with people from the same locality, school or regiment. This is a way of economizing on information in selecting colleagues and trading partners as well as of reducing the incidence of opportunism. Bad hats, as well as people who succumb to short-term temptation, can be found everywhere, but

they may be easier to identify among a group whom the selector is already familiar with and whose mores she understands. Furthermore, Lindenberg (2000) argues that allegiance to a group leads to greater stability of normative frames in which people are eager to “act appropriately” or “to do the right thing” than is likely to occur in dyadic relationships. In the case of a constructed market, the behavior of participants may be constrained by membership in two groups, the larger social category from which they are drawn and their immediate colleagues in the market itself. Whether from sensibility or fear of sanctions, parties to a transaction within a well-defined and easily monitored group are likely to be reluctant to “let the side down” as well as to shame themselves.

Contracts may not be necessary when a clan can be constructed. Ouchi (1980, 132), following Durkheim’s concept of an organic association, defines a clan as something “which resembles a kin network but may not only include blood relations.”²⁰ As a result of socialization to common norms, the members of a clan share values and beliefs as well as views on reciprocity and legitimate authority. Although Ouchi (1980) is referring primarily to employees of an single organization, the same set of characteristics are needed in constructed markets in which the members compete but are able to gain efficiency through an acceptance of common goals and procedures that reduces, but cannot completely remove, the need for monitoring.

Opportunism is not the only reason for choosing trading partners with great care. Unpredictable shocks can cause disaster in a world of uncertainty, even shocks that apply only indirectly to an associate. When there is unlimited liability for debts – which was the norm when many markets were constructed and still applies to transactions in many financial markets²¹ – a person can be forced to pay debts that might more appropriately be assigned to his partners. Thus there is a potential for asymmetry in returns as an investor can bear risk for his partners without being entitled to share fully in their gains. Following recent disasters,

the ability of Lloyd's syndicates (of which there are presently 63) to vet the finances of their participating Names has kept claims from becoming the responsibility of only a few of the more solvent Names and assured that the claims would be paid by the syndicates as originally contracted. This has caused extreme discomfort for some of the less wealthy Names but has also confined the damage within Lloyd's and ensured that it could continue to issue policies. The pitfalls of partnerships with unlimited liability extend even further. When a risk may arise not just from the indiscretions or misjudgments of a partner but from those of that person's other partners, a default can lead to a disaster spreading several removes from its origins. This again supports restricting the operations of a market to people from a group that can be easily monitored as it is necessary to collect information that extends beyond things that, at first glance, seem directly relevant to potential participants in the market.

The benefits of regulation in constructed markets are therefore manifold. Participants in constructed markets or other regulators can decide the scope of the market's activities in order to achieve appropriate levels of specialization. Within the normal meaning of production costs, these markets are able to control their own venues and some proportion of their personnel and capital, even when the regulation is external. As a result of being managed, constructed markets are better able to ensure sufficient levels of efficiency and transparency by placing controls on the number of participants. Most importantly, because the number of participants can be controlled, managers of constructed markets can also scrutinize their characteristics and monitor their activities (Lindenberg, 2000) relatively cheaply. As a result, constructed markets are able to deal with substantial levels of opportunism and risk without impairing their ability to function efficiently.

3. Stock Exchanges as Constructed Markets

The operations of constructed markets can be illustrated by examining aspects of the history of the two most important stock exchanges, in London (LSE) and New York (NYSE) and then comparing these with development of the Sydney Stock Exchange (SSE).²² While their stories run parallel in many respects, they also show the effects of local environments on institutional development.

Institutional economists and economic historians have already charted the contingent nature of the establishment and increasing sophistication of markets over the past thousand years and they have also examined self-regulation as a device for reducing transaction costs as far back as the Middle Ages (North, 2005; Greif, 2006; Milgrom, North and Weingast, 1990; Greif, Milgrom, and Weingast, 1994). The evolution of stock exchanges provides a different perspective, however, because of their role in developing modern institutions and their continuing importance. They therefore offer a good set of examples of how specialized markets have been consciously constructed over an extended period on a trial-and-error basis in order to cope with changing circumstances.²³

The London and New York Stock Exchanges

Technically, both the LSE and NYSE date from the early years of the nineteenth century. Both were built on earlier institutional structures, however, and in the case of the LSE the history of the marketing of securities already dated back more than a century and had achieved considerable technical sophistication before the Stock Exchange was formally set up. According to Morgan and Thomas (1962, 11),

There are several conditions that must be fulfilled before a specialist group of dealers in stocks and shares can arise. Before there can be the makings of a regular market there must obviously be a considerable volume of securities, the ownership of which

is fairly widely distributed; there must be a sufficient number of wealthy men and women who wish to hold some of their possessions in financial assets rather than in business or real property; the development of the market will also be greatly assisted if the law recognises simple procedures for the transfer of titles; if shares are of convenient and fairly small denominations, and if there is a banking system to provide a simple means of payment. All these conditions had been fulfilled in England by the end of the seventeenth century.

Throughout the late seventeenth and eighteenth centuries, a growing market for securities (principally to cover the national debt) and a smaller market for shares in joint-stock companies led to a variety of trading arrangements. Originally, brokers and jobbers met alongside others in the Royal Exchange which, like the brokers themselves, was not highly specialized. Before they left for other venues in 1696, “dealers in stocks and shares ... had a ‘walk’ near the centre of the building between the salters, the Italian merchants and the Canary merchants” (Morgan and Thomas, 1962, 27). Subsequently, the dealers met in neighboring streets and coffee houses, and in the Rotunda of the Bank of England until they were effectively evicted in the 1830s (Michie, 1999).

Although a privately-owned building called the Stock Exchange was a major site for trading from 1773, the foundation of the London Stock Exchange as an institution is usually regarded as having occurred in 1801, when access to a new building was limited to members who paid a subscription fee, creating a closed market in the midst of the otherwise open London securities market. Even then, however, the LSE did not take over the securities market, even in the capital. What it did do was to institute a system under which a self-selected group of brokers could regulate the way in which *they* engaged in trade. Michie therefore distinguishes between a securities market and a stock exchange by defining the

latter as “A market where specialized intermediaries buy and sell securities under a common set of rules and regulations through a closed system dedicated to that purpose” (1999, 3).

Thus while the LSE did not succeed in taking over the entire securities market, it did impose a framework in which the members were able to reduce the amount of risk that they faced in comparison to outsiders who also dealt in securities.²⁴

The establishment of the NYSE followed a similar path, although in a less developed setting. Moreover, New York’s place as the financial heart of the United States was not fully established until after the NYSE had been operating for a number of years. Before then, Philadelphia was the dominant center. As in London, dealing in securities in New York was decentralized and uncontrolled until the last years of the eighteenth century. Brokers met in coffee houses in the vicinity of Wall Street in Lower Manhattan until 1792 when a specialized meeting place, the Tontine Coffee-House,²⁵ was built at the corner of Wall and Water Streets (across from Alexander Hamilton’s house). By then, in May 1792, a group of brokers had already agreed to regulate commissions (Sobel, 1965).

The owners of the Tontine were not specialist brokers but businessmen for whom securities were a minor interest. The establishment of the NYSE came in 1817 when the New York Stock and Exchange Board was set up following a visit by New York brokers to examine the operations of their rivals in Philadelphia (Sobel, 1965; Geisst, 2004). Like the LSE, the Stock and Exchange Board and its successor, the NYSE had a constitution that specified who was eligible to be a member and regulated their conduct.

The main reason for establishing the two Stock Exchanges was not to protect the public but to protect the members against problems caused by other brokers.²⁶ In some cases, opportunism was the target, but the rules also attempted to reduce risk. In the process, over a

long period, both exchanges moved closer to what would today be considered “efficient” markets because they facilitated a more open distribution of knowledge among brokers.

The managers of the London Stock Exchange (the representatives of the members who acted through the Committee for General Purposes) deliberately established an environment in which rules were known and could be fairly and comprehensively enforced. In 1812, the first set of *Rules and Regulations of the Stock Exchange* (London Stock Exchange, 1812) was compiled to eliminate redundancies and inconsistencies and to fill gaps in earlier, uncodified, collections of rules. The Rules and Regulations were amended and republished at intervals until 1905 when the General Purposes Committee assigned its Sub-Committee for Rules and Regulations to undertake a general overhaul.²⁷ The result (London Stock Exchange, 1906) was a thorough reconsideration of the directives governing operations on the LSE.²⁸

Both markets relied on their members to be able and willing to settle their debts in full and on time. Time considerations were especially important in the case of the LSE because settlement was often weeks after transactions occurred, in contrast to the NYSE which insisted on settlement the following day to avoid any suggestion of gambling (Michie, 1987 and 1988). Although commissions were a fraction of one per cent of the value of trades, the sums involved could be enormous relative to the capital of the brokers. Guarantees that members deposited with the LSE (£250 until 1832 when they were increased to £300) were tiny in comparison to the amounts that could be lost. When Thomas Manson failed in 1814, for example, he had outstanding commitments to fellow members of £134,000 while J. and L. Burnand owed £437,000 when they went bankrupt in 1835 (Michie, 1999). On the other side of the Atlantic, before the NYSE was founded, the 1792 bankruptcy of William Duer, a friend and associate of Hamilton, led to a decline in securities transactions that lasted for

several years (Sobel, 1965). Even eighty years later, the entire operations of the NYSE collapsed with the failure of Jay Cooke and Co. in 1873 (Geisst, 2004). It is hardly surprising that a major thrust of the regulations of both exchanges was the recruitment of sound members and the implementation of mechanisms to monitor their subsequent activities.

In Britain, the LSE formed a part of what Cain and Hopkins (2002) have called “gentlemanly capitalism”, a regime under which people of substance and sound reputation tried to restrict their business operations to others of similar background. In overseas trade, shipping, and insurance, as well as in securities markets, education, family, marriage and other characteristics came to be used as sorting devices. They were not, of course, the sole indicators of probity (at least among sensible people) as shady personal behavior could override background and lead to exclusion from trade with people who were both cautious and of substance. Similarly, the NYSE tried to restrict its membership to people of honesty and means, although perhaps with less success than the LSE (or some other American exchanges such as Boston) were able to command (Geisst, 2004).

The membership policies of the two exchanges, although directed toward the same end, differed considerably. Until shortly before the First World War, the London Stock exchange did not attempt to restrict the number of members but concentrated instead on the characteristics of the members and imposed strict controls on their activities to reduce risk to other members. Membership was generally open to qualified brokers or jobbers and the costs of admission were relatively cheap (around £1200 in 1904, or £440 for a stockbroker’s clerk). As a result, membership rose from 864 in 1850 to 5,567 in 1905 (Michie, 1987).²⁹ But because the required personal wealth was small, the LSE carefully restricted the activities of its members: All partners in a firm had to be members and were barred from outside activities including banking and the law.³⁰ There were two main reasons for this. First, it

was easier to monitor members who were not allowed to take part in other businesses. Equally important was that the policy reduced the exposure of members of the exchange to misfortunes that befell non-members, a matter of great importance before limited liability became common and partners were liable not only for their own debts but for those of their partners. To reduce the chance of ripple effects arising not from opportunistic or imprudent behavior by members but from problems that might literally arise anywhere in the world, the LSE simply forbade its members from becoming involved in other businesses (Michie, 1987 and 1999).

Regulation of the activities of members was extended to included their authorized and unauthorized clerks. When the *Rules and Regulations* were overhauled in 1906, the LSE was careful to ensure that, with the exception of age and experience, clerks conformed to the characteristics required of members (London Stock Exchange, 1906). Furthermore, the size of each firm was carefully limited (and the ability to monitored its activities correspondingly increased) by caps on the number of clerks, both authorized and unauthorized, that could be employed. In 1901, a meeting of the Committee for General Purposes actually decreased the total members of clerks allowed to a firm from seven to five.³¹

The New York Stock Exchange, by contrast, was far less open to accepting new members in later years. The original initiation fee was a very modest \$25, although undesirable applicants could be, and were, blackballed. In the 1840s, this was raised to \$400 in the hope of eliminating poorer applicants and from 1869 the number of seats was effectively frozen.³² From this time onwards, seats could be bought or sold and prices soon rose, reaching between \$64,000 and \$94,000 (£13,000-£18,800) in 1910. As a result, members of the NYSE were in general wealthier than those of the LSE. This was magnified by the fact that holders of seats in New York could engage in a wider range of business and

generally formed more highly capitalized firms that were better able to withstand shocks (Geisst, 2004; Michie, 1987). Finally, the earlier availability of general limited liability in parts of the United States (Micklethwait and Wooldridge, 2003) may have reduced concerns over conducting business with outsiders.

The purpose of these rules was not necessarily to establish monopolies.³³ In fact, they probably had the opposite effect by generating membership barriers that were hard to surmount at a time when there were few if any government restrictions on trading securities in Britain or the United States to deter outsiders from establishing competing markets. As a result, neither the London nor the New York Stock Exchange controlled trading in securities in their home markets. Both countries had regional exchanges as well as brokers who acted independently. In addition, the NYSE had two large competitors in New York itself, the Consolidated Stock Exchange and the Curb Exchange. By 1913, the NYSE had 1100 traders but the Consolidated had 1,225 and there were at least 200 members of the Curb Exchange (Michie, 1987; Sobel, 1970). Instead, the LSE and the NYSE were designed (a word used advisedly) to protect their members by regulating and monitoring their actions. In the process of reducing opportunism and risk, they also moved by stages towards the creation of what would now be known as more “efficient” markets. That is, through conscious rule-making, they were able to reduce transaction costs to manageable levels. They therefore not only illustrate the value of transaction costs (in this case the compliance costs of conforming to rules intended to mitigate the effects of opportunism and risk) in lubricating a market but also demonstrate how constructed markets can, under suitable circumstances, be alternatives to both unstructured markets and hierarchies.

The Sydney Stock Exchange

The history of the Sydney Stock Exchange, which was apparently founded in May, 1871 (Salsbury and Sweeney, 1988), gives additional insight into the ways in which different environments can affect the management of markets. Although the founders of the exchange shared the legal heritage and economic views of their American and, particularly, British counterparts, the SSE differed in that Australia offered thinner and perhaps more fragmented markets than prevailed in larger countries. Equally importantly, while the rules and practices of the London and New York Stock Exchanges were originally rudimentary and evolved through trial and error as their home economies became more complex in the nineteenth century, the founders and members of the Executive Committee of the SSE were able to build on the earlier experiences of exchanges overseas that provided templates for the modeling of their own regulations. Consequently, the SSE eventually adopted a set of rules that mirrored London in paying more attention to the attraction of members with suitable characteristics than to capping numbers, but that followed the NYSE by creating a seat system.

Salsbury and Sweeney (1988, 251) contend that “For [the leaders of the SSE] the Stock Exchange was not a corporation, but an association of gentlemen bound together by integrity of character and mutual trust.” This is unquestionably true, but (for better or for worse) the SSE was nevertheless a carefully-managed and rule-driven organization.

The rules governing membership of the SSE varied with economic conditions, with the qualifications and fees required of new members rising and falling regularly between 1871 and 1940.³⁴ The initial set of *Rules and Regulations* in 1872 provided that members were to be elected by a majority vote of a quorum of the Exchange’s standing committee but no mention was made of the requirements to be a member beyond the payment of a five guinea³⁵ entrance fee. As there were no annual fees at the time, the formal qualifications

were quite loose, although the membership applications of people known to have unspecified undesirable characteristics were no doubt expected to be vetoed by the standing committee.

By 1875, an annual fee of two guineas had been instituted and Rule I now provided that, “The Members of the Sydney Stock Exchange shall consist of Brokers engaged [extensively]³⁶ in the purchase and sale of Shares, Debentures, Exchanges, Mines and Mining Interests and in the negotiation of other monetary transactions.” Rule X of the 1875 *Rules and Regulations* followed the LSE by providing that all partners of a firm of brokers had to be members of the SSE if any were, and laying down that if one partner were excluded a new firm of brokers would have to be formed without the offending man if the other partners were to become members of the Exchange.

The 1880s, a relatively buoyant period, saw a tightening of membership rules. In the 1881 *Rules and Regulations*, “extensively” was changed to “exclusively” in Rule 1, prohibiting members of the SSE from engaging in any other businesses. As a result, the Exchange became a closed body that, in theory, should have been insulated from financial problems faced by non-members.³⁷ As a strategic move, in 1887 members of the SSE were prohibited from being members of “any other exchange in Sydney engaged in the same business” (*Rules of the Sydney Stock Exchange*, 1887, Rule I). At the same time, a new rule was introduced to free the Exchange from the taint of bankruptcy. This tightening was made possible by a growth in the number of potential members during the decade – 31 new members were admitted in the 1880s in contrast to the two new members who joined between 1875 and 1879 (Salsbury and Sweeney, 1988 and 1992). Further tightening resulted from fee increases during the decade, as entrance fees rose from five guineas to £1,000 and annual fees rose from two to 15 guineas. Rapid increases in entrance fees was accompanied by the introduction of a seat system that allowed members to sell their memberships if they retired

honorably. It is clear that these new measures were facilitated by the Broken Hill boom of the later part of the decade, with 18 of the new members joining between 1887 and 1889 (Salsbury and Sweeney, 1988).³⁸

Membership rules were loosened again in the relatively depressed years of the 1890s. In 1890, before the full impact of the depression following the Broken Hill boom was known, the Exchange proposed to limit the number of members to 50. In the event, the limit was unnecessary and was never activated. Although the entrance fee was £1,000 from the end of 1889, because of the crash members were unable to sell their seats at the full price. In March, 1892, one of the original members of the exchange received only £300 for his seat when he retired. According to a handwritten note in the Exchange's copy of the Rules, as late as September, 1904 the entrance fee was reduced to £600 until five new members had been elected.³⁹ Even though 52 new members were admitted between 1890 and 1910, the price at which seats changed hands did not reach its nominal value of £1,000 again until the latter year (Salsbury and Sweeney, 1988). In addition, rules concerning bankruptcy and default among members were loosened in the course of the 1890s.

Despite the devaluation of seats, in 1896 the SSE actually expanded the numbers allowed to trade by creating a new category of "authorised dealer". This coincided with a move to new premises with a large ground floor "vestibule" below the trading room. The authorised dealers were not allowed to visit the trading floor or to deal with customers on the premises, but they could trade with members and with each other in the vestibule. Originally the authorised dealers paid £15 each per annum (Salsbury and Sweeney, 1984), but in 1899 an entrance fee of 50 guineas was instituted along with an annual charge of 25 guineas. Thus the SSE may have viewed authorised dealers as a source of additional income at a time when its commission for selling seats had eroded.

The interwar years brought further changes in membership rules. By 1921, the Exchange had determined that the entrance fee would rise from £1,000 to £1,500 as soon as membership reached 72,⁴⁰ but eventually rescinded the decision. Entrance fees continued to rise throughout the period, however, reaching £2,000 in October, 1927, £2,500 in October, 1929 (two weeks before the NYSE's "Black Thursday"), £3,000 in June, 1933, £4,000 in January, 1935, and £5,000 in November, 1936. The motivation behind these increases – at a time when the Australian economy was performing poorly – is unclear, but they probably represented attempts to make an intimate institution even more close knit.⁴¹ As early as 1920, the category of authorised dealer had been abolished, perhaps because almost all brokers in Sydney at that time were already members of the SSE (Salsbury and Sweeney, 1988).

The new restrictions on membership probably were as much an example of the poor use of a strategic tool than a response to opportunism or other transaction cost considerations. As Carlton (1984) and Geroski (1998) have suggested, constructed exchanges with centralized management are well equipped to move strategically. Michie (1987, 1999), for instance, discusses the strategic use of flexible commission fees by the LSE and the problems that arose when fixed fees were introduced in 1912. The primary concern of the SSE was to achieve a monopoly of business in Sydney by bringing in measures that unfortunately also restricted the Exchange's ability to deal with competition in other parts of Australia. As the SSE was not in a strong position, these maneuvers backfired. By 1914, the Stock Exchange of Melbourne had overtaken the SSE as Australia's largest exchange (Salsbury and Sweeney, 1988).

Moreover, capital raising in Australia shifted to a new basis in the interwar period, which placed greater emphasis than in the past on an ability to raise funds nationally

(Salsbury and Sweeney, 1988). Although the SSE was successful in gaining nearly absolute control of activities in Sydney, this was achieved in part through policies intended to reduce connections between its members and other stock exchanges in New South Wales and Australia as a whole. From 1922, members of the SSE were forbidden to conduct business outside the City of Sydney.⁴² By 1927, the Exchange had also placed restrictions on the ability of its members to act as underwriters in collaboration with members of other stock exchanges. Consequently, exchanges in Melbourne and elsewhere were able to scoop up business in important country areas, including those in New South Wales, and to cooperate on national flotations more easily than members of the SSE could, further undermining Sydney's competitiveness, a state that continued well into the post World War II period (Salsbury and Sweeney, 1988).

Other Variations

The experiences of the London, New York, and Sydney Stock Exchanges show that, under the proper circumstances, devices may be found to mitigate transaction costs. The different paths taken also show, however, that there was not any single way of dealing with problems. Local conditions, including the regulatory environment, were also important. Moreover, once a set of rules was decided upon, this tended to reduce the range of available choices for subsequent revision, perhaps because of property rights gained by the members as a result of the initial formulation (Neal and Davis, 2006).

The development of the Paris Bourse was far different than the routes followed in English-speaking countries. The *ancien régime* undertook to regulate the market for securities in the early eighteenth century in order to stop stockjobbing and other practices that the State regarded as unsuitable. Following a brief period of suppression (1793-95), the Bourse was reopened under stringent rules laid down by the government under the Consulate

(the law of 28 Ventôse, year IX and the decree of 27 Prairial, year X) and the First Empire (the *Code de Commerce* of 1807). Among other things, these laws gave the stockbrokers of the Bourse a monopoly in the trade of all securities. The number of stockbrokers was also limited to 60 (raised to 70 in 1898) and the brokers were given ownership of their positions (Vidal, 1910). Not surprisingly, the price of membership in the Bourse in 1914 was £92,000 as opposed to £16,000 for a seat on the NYSE and as little as £440 for membership in the LSE (Davis and Neal, 1998). The practical effect of these dramatic differences in the numbers of members for the efficiency of the three exchanges is nevertheless unclear. Max Weber (2000 [1894]) believed that the English model was superior to the externally regulated model followed in Paris, Berlin, and Vienna. The size of the Paris Bourse (20 per cent of world listings at the beginning of the First World War, about the same as the NYSE (Neal and Davis, 2006)) suggests, however, that both models were highly viable.

The histories of two other British institutions reinforce both the importance of controlling market participation and the variety of paths that may be taken to achieve that end. The Discount Market in England and Wales originally developed to redistribute surplus funds from rural regions in which there were surpluses to those that were in deficit. In the course of the nineteenth century, the amount of responsibility that the Bank of England, which was at that time privately-owned and directed, assumed for the stability of the Discount Market increased as it very slowly embraced the responsibilities associated with being a lender of last resort after 1825. It only dealt with bills that had two reputable signers and charged the highest rates possible to most firms (although firms that were known to be sound could be charged less) (Scammell, 1968). In response, the number of traders fell from between 1,200 and 1,500 early in the twentieth century to 74 in 1909. In 1911, the Discount Office of the Bank gave unfavorable gradings to houses that did not have regular discount accounts with the Bank, forcing a number of firms of high standing and credit worthiness that

had not previously opened such accounts to do so (Clapham, 1944). In the 1920s, the Bank went further as the Discount Office used its power to review balance sheets to discriminate against discount houses that it felt to be over-extended (Sayers, 1976). Thus the Discount Market was neither self-regulated nor formed by state regulations, but the characteristics and practices of the participants came nevertheless to be closely controlled in order to ensure market efficiency.

The history of Lloyd's reveals that self-regulation of the activities of its members also developed after a period of reluctance to assume responsibility. Lloyd's describes itself as "the world's leading insurance market providing specialist insurance services" (Lloyd's, 2006). It was established to spread risk widely by issuing policies backed by large pools (syndicates) of people (Names) with funds to invest. Since the backers have to be reliable and fraud needs to be kept within tight limits to allow a reasonable prospect of profitability from the sale of marine and other types of insurance, the insurers try to block potential opportunism by vetting Names before they are allowed to invest, just as it assesses the risks facing shipowners and others who want to buy policies. While internalization in the form of self-insurance would be a possible alternative for potential policy holders who are worried about being cheated when they make legitimate claims, many people or firms would find the risk excessive. As a result, they are willing to pay slightly more in order to do business with insurers who operate in a formally demarcated and self-regulated market. Equally importantly, the closed nature of Lloyd's protects the investors from serious risk of default on the part of other Names in their syndicates (Beeman, 1937; Hodgson, 1986).

"Lloyd's always said it was a market and not a business" (Mantle, 1992, 4). Over an extended period in the nineteenth and early twentieth centuries, however, the Committee of

Lloyd's was forced to admit that it needed to manage its market if solvency and a good reputation were to be preserved. As one historian has noted,

Nothing in the history of Lloyd's is more remarkable to modern eyes than the slowness – one might almost say the reluctance – with which members came to recognize their common interest in the security of a Lloyd's policy (Gibb, 1957, 122).

Although both the London Stock Exchange and Lloyd's evolved from informal seventeenth century institutions, Lloyd's lagged the LSE by nearly a hundred years in enacting regulations to enforce the solvency of its members. The first meaningful attempt to exclude insolvent underwriters was not made until the 1850s and even then was of dubious legality. Even after Lloyd's was formally incorporated by Parliament in 1871, with provisions for expelling members, action was rarely taken to ensure that policy holders were protected against defalcation by members. Over the years, the practice of asking new members to provide guarantees or deposits grew but policies were informal and unevenly applied by the Committee. It was only in 1909, in the face of recent scandals and pressure from *The Times*, that all members were required to deposit the premiums they had collected and to agree to annual audits (Gibb, 1957; Brown, 1987). In the end, however, the policies adopted were similar to those of other constructed markets such as the LSE.

The range of options available for managing markets is wide and no single framework is suitable for all cases. As Neal and Davis (2006) point out, there are generally trade-offs in which any type of regulation may generate unfortunate side-effects. For example, although the easier availability of membership in the LSE may have made it a more efficient market than the NYSE or the Paris Bourse for much of the nineteenth century, it was beginning to suffer from congestion by 1914. Which rules should be adopted is therefore an empirical question to which the answer will not always be known in advance and which can be

expected to evolve through trial and error strategies. The important variables include the institutional environment, government policy, and the technologies available, as well as the earlier experiences of the participants who are being regulated. As these can change, optimal management policies can also be expected to change. The point remains, however, that a sharp distinction between markets and hierarchies is often inappropriate and that markets can be managed to reduce transaction costs.

4. Discussion and Conclusions

The need to manage markets to keep opportunism and other transaction costs within reasonable limits is likely to grow. As information and communications technologies improve, problems similar to those faced by Lloyd's and the stock exchanges in managing the activities of market participants will become increasingly important. This may be especially true of what may be called proprietary markets such as eBay where revenues depend on protecting users against opportunism. These markets often appear to be decentralized from the standpoint of buyers and sellers but, whereas *caveat emptor* or government regulation may be appropriate for "normal" decentralized markets, it is reasonable to expect that the owners of virtual markets will also attempt to enforce standards of conduct in order to avoid damage to their reputations and incomes. Weapons developed in the past to reduce risk and uncertainty will form part of the armory that proprietors bring to regulating behavior even in environments that differ significantly from traditional ones.

The analysis and case studies presented here demonstrate, firstly, that markets and hierarchies are not necessarily alternative forms of organization. Some of the most important markets have been consciously constructed as hierarchies in order to increase their competitive strength both locally and internationally. Although I have used the terms *regulation* and *self-regulation*, *management* better describes the processes examined in many

cases. Financial markets, such as stock and commodities exchanges, are best thought of enterprises producing services in the form of transactions.⁴³ This may be done with varying degrees of efficiency, and if efficiency levels are too low, the enterprise is likely to fail. As recent attempts at diversification and merger have shown, these markets are subject to many of the management techniques that normally come to mind in relation to other types of firms. In the cases discussed here, the emphasis has been on increasing efficiency through improving knowledge flows while simultaneously reducing exposure to opportunism and risk. This is a common program for managers in many industries, but the need to develop coping techniques probably arose earliest in financial markets, overseas trade, and similar areas in which the connection between communications and opportunism and risk have long been important for survival.

A second major point is that transaction costs are not necessarily frictions or noise and that they may contribute substantially to the successful use of markets. As a concept, this is not entirely new (Macneil, 1981; Lindenberg, 2000; Nooteboom, 2002; Jacobides, 2005; Langlois, forthcoming), but I have gone further by describing how markets may be specifically designed, not only to reduce transaction costs, but to improve their economic efficiency at the same time. This is possible because for markets (in contrast to the goods or services traded in markets), what outsiders may perceive as transaction costs are frequently also production costs. As a result, it is sometimes possible for the people who control markets to reduce the transaction costs of their users in the process of reducing their production costs. Not all markets are amenable to this type of treatment because many are too decentralized and approximate Salter's description of a "system [that] works itself" (or Adam Smith's Invisible Hand). In some cases, however, including important financial and commodity markets, it has been possible to improve consciously on trading systems that have evolved naturally.

Several lessons can be derived from the story told here. The first concerns transaction cost analysis and the relationship between transaction costs and production costs. Regardless of whether one accepts the use of the word “trust” to describe calculative behavior, it is clear that people have frequently consciously manipulated their environments to reduce the probable effects arising from opportunism. In addition to hierarchies and to markets as conventionally understood, it is possible to construct markets that are as efficient as, or more efficient than, markets that have evolved organically. This can be – and in important cases such as the stock exchanges in nineteenth century France, Germany, and Austria, has been – done through either cooperation or fiat. This implies that economists could profit from a deeper study of the ability of a wide range of institutional arrangements to attenuate transaction costs. Even though there are costs involved in setting up new types of institutions, this is not relevant as long as the resulting savings are larger. Thus further research should extend beyond exchanges to look at arrangements between other configurations of buyers and sellers (e.g. real estate markets and electronic auctions) as well as along supply chains (as Cacciatori and Jacobides (2005) have recently begun to explore).

The relationship between transaction costs and classical costs of production also deserves more thought than it has received to date. It is clear that some of the most important classes of transaction costs have had implications for production costs that go beyond simple make-buy decisions. For instance, the potential for hold-up is not only a possible transaction cost but may affect the choice of a production function. When hold-up is likely, therefore, it should be included in discussions of production costs as well as of opportunism. This blurring between production and transaction costs extends, as here, into other parts of the economy – in fact, into any activity in which the conduct of transactions is a major aspect of a firm’s business. Defined in this way, transaction costs as production costs affect significant

sectors of modern economies, both for specialist traders and for firms such as McDonalds for whom the production and the sale of a good or service are closely related.

Finally, because of their ability to maneuver strategically, the possibility of managing markets not only affects their operations and the welfare of their members but also the welfare of other firms, national economies, and even the world economy. Although the cases cited are historical, these considerations have become increasingly important in recent years as a result improved communications and the partial abandonment of a number of barriers to trade in general and capital flows in particular. The way in which these markets are administered and their strategic activities are therefore important to policy makers and to the public at large.

REFERENCES

- Ames, Edward and Rosenberg, Nathan (1965), "The Progressive Division and Specialization of Industries", *Journal of Development Studies* 1, 363-383.
- Beeman, M. M. (1937). *Lloyd's of London: An Outline* (London: n.p.)
- Bernstein, Peter L. (1992). *Capital Ideas: The Improbable Origins of Modern Wall Street* (New York: Free Press).
- Black, John (2002). *Oxford Dictionary of Economics*, 2nd ed. (Oxford: Oxford University Press).
- Brown, Anthony (1987). *Hazard Unlimited: From Ships to Satellites, 300 Years of Lloyd's of London, An Intimate Portrait*, 3rd ed. (London: Lloyd's of London Press).
- Buzzell, R (1978), "A Note on Market Definition and Segmentation", Harvard Business School, Casenotes 579-083.
- Cacciatori, Eugenia and Jacobides, Michael G. (2005), "The Dynamic Limits of Specialization: Vertical Integration Reconsidered", *Organization Studies* 26: 1851-1883.
- Cain, P. J. and Hopkins, A. G. (2002). *British Imperialism 1688-2001*, 2nd ed. (London: Longman).
- Callon, Michel (1998), "Introduction", in Michel Callon, ed., *The Laws of the Markets* (Oxford: Blackwell).
- Campbell, David and Harris, Donald (1993), "Flexibility in Long-Term Contractual Relationships: The Role of Co-Operation", *Journal of Law and Society* 20, 166-191.
- Carlton, Dennis W. (1984), "Futures Markets: Their Purpose, Their History, Their Growth, Their Successes and Failures", *Journal of Futures Markets* 4, 237-271.
- Caves, R. E. (1964). *American Industry: Structure, Conduct, Performance* (Englewood Cliffs: Prentice Hall).
- Caves, R. E. (1992). *American Industry: Structure, Conduct, Performance*, 7th edition (Englewood Cliffs: Prentice Hall.)
- Chiswell, Francis (1902). *Key to the Rules of the Stock Exchange, Embodying a Full Exposition of the Theory and Practice of Business in the "House"* (London, Effingham Wilson).
- Clapham, J. H. (1944). *The Bank of England: A History*, 2 vols. (Cambridge: Cambridge University Press).
- Coase, Ronald H. (1937), "The Nature of the Firm", *Economica* N.S. 4, 386-405.
- Coase, Ronald H. (1960), "The Problem of Social Cost", *Journal of Law and Economics* 3, 1-44.

- Coase, Ronald H. (1993a [1988]), “The Nature of the Firm: Origin”, in Oliver E. Williamson and Sidney G. Winter, eds., *The Nature of the Firm: Origins, Evolutions and Development* (New York: Oxford University Press), 34-47 (originally in the *Journal of Law, Economics, and Organization*, 4, 1988).
- Coase, Ronald H. (1993b [1988]), “The Nature of the Firm: Influence”, in Oliver E. Williamson and Sidney G. Winter, eds., *The Nature of the Firm: Origins, Evolutions and Development* (New York: Oxford University Press), 61-74 (originally in the *Journal of Law, Economics, and Organization*, 4, 1988).
- Colli, Andrea (2003). *The History of Family Business 1850-2000* (Cambridge: Cambridge University Press).
- Davis, Lance and Neal, Larry (1998), “Micro Rules and Macro Outcomes: The Impact of the Structure of Organizational Rules on the Efficiency of Security Exchanges, London, New York, and Paris, 1800-1914”, *American Economic Review* 88, 40-45.
- Geisst, Charles R. (2004). *Wall Street: A History from its Beginning to the Fall of Enron* (New York: Oxford University Press).
- Geroski, P. A. (1998), “Thinking Creatively about Markets”, *International Journal of Industrial Organization* 16, 677-695.
- Gibb, D. E. W. (1957). *Lloyd’s of London: A Study in Individualism* (London: Macmillan).
- Green, Christopher J., Maggioni, Paolo, and Murinde, Victor (2000), “Regulatory Lessons for Emerging Stock Markets from a Century of Evidence on Transactions Costs and Share Price Volatility in the London Stock Exchange”, *Journal of Banking and Finance* 24, 577-601.
- Greif, Avner (2006). *Institutions and the Path to the Modern Economy* (Cambridge: Cambridge University Press).
- Grief, Avner, Milgrom, Paul, and Weingast, Barry R. (1994), “Coordination, Commitment, and Enforcement: The Case of the Merchant Guild”, *Journal of Political Economy* 102, 745-776.
- Hodgson, Godfrey (1986). *Lloyd’s of London: A Reputation at Risk*, 2nd. ed. (Harmondsworth: Penguin).
- Jacobides, Michael G. (2005), “Industry Change Through Vertical Disintegration: How and Why Markets Emerged in Mortgage Banking”, *Academy of Management Journal* 48, 465-498.
- Langlois, Richard N. (1992), “Transaction-cost Economics in Real Time”, *Industrial and Corporate Change* 1, 99-127.
- Langlois, Richard N. (forthcoming), “The Secret Life of Mundane Transaction Costs”, to appear in *Organization Studies*.
- Langlois, Richard N. and Robertson, Paul L. (1995). *Firms, Markets and Economic Change: A Dynamic Theory of Business Institutions* (London: Routledge).

- Lie, John (1998). *Han Unbound: The Political Economy of South Korea* (Stanford: Stanford University Press).
- Lindenberg, Siegwart (2000), "It takes Both Trust and Lack of Mistrust: The Workings of Cooperation and Relational Signaling in Contractual Relationships", *Journal of Management and Governance* 4, 11-33.
- Lloyd's (2006), "About us", www.lloyds.com (reference current as of 17 July, 2006).
- Lo, Andrew W. (1997), "Introduction", in Andrew W. Lo, ed., *Market Efficiency: Stock Market Behaviour in Theory and Practice*, vol. 1 (Cheltenham: Edward Elgar).
- London Stock Exchange (1812). *Rules and Regulations of the Stock Exchange* (London: London Stock Exchange).
- London Stock Exchange (1906). *Rules and Regulations of the Stock Exchange* (London: London Stock Exchange).
- MacKenzie, Donald and Millo, Yuval (2003), "Constructing a Market, Performing Theory: The Historical Sociology of a Financial Derivatives Exchange", *American Journal of Sociology* 109, 107-145.
- Macneil, Ian R. (1981), "Economic Analysis of Contractual Relations: Its Shortfalls and the Need for a "Rich Classificatory Apparatus", *Northwestern University Law Review* 75, 1018-1063.
- Macneil, Ian R. (1982), "Efficient Breach of Contract: Circles in the Sky", *Virginia Law Review* 68, 947-969.
- Mantle, Jonathan (1992). *For Whom the Bell Tolls: The Lesson of Lloyd's of London* (London: Sinclair-Stevenson).
- Michie, R. C. (1987). *The London and New York Stock Exchanges 1850-1914* (London: Allen and Unwin).
- Michie, R. C. (1988), "Different in Name Only? The London Stock Exchange and Foreign Bourses, c. 1850-1914", *Business History* 30, 46-68.
- Michie, R. C. (1999). *The London Stock Exchange* (Oxford: Oxford University Press).
- Micklethwait, John and Woodridge, Adrian (2003). *The Company: A Short History of a Revolutionary Idea* (London: Weidenfeld and Nicolson).
- Milgrom, Paul R., North, Douglass C., and Weingast, Barry R. (1990), "The Role of Institutions in the Revival of Trade: The Law Merchant, Private Judges, and the Champagne Fairs", *Economics and Politics* 2, 1-23.
- Morgan, E. V. and Thomas, W. A. (1962). *The Stock Exchange: Its History and Functions* (London: Elek).

- Neal, Larry and Davis, Lance (2006), "The Evolution of the Structure and Performance of the London Stock Exchange in the First Global Financial Market, 1812-1914", *European Review of Economic History* 10, 279-300.
- Nooteboom, Bart (2000), "Trust as a Governance Device", in Mark Casson and Andrew Godley, eds., *Cultural Factors in Economic Growth* (Berlin: Springer).
- Nooteboom, Bart (2002). *Trust: Forms, Foundations, Functions, Failures and Figures* (Cheltenham: Edward Elgar).
- North, Douglass C. (2005). *Understanding the Process of Economic Change* (Princeton: Princeton University Press).
- Ouchi, William G. (1980), "Markets, Bureaucracies, and Clans", *Administrative Science Quarterly* 25, 129-141.
- Ouchi, William G. (1984). *The M-Form Society* (Reading, Ma.: Addison-Wesley).
- Pass, Christopher, Lowes, Bryan, and Davies, Leslie (2005). *Collins Dictionary of Economics*, 4th ed. (Glasgow: HarperCollins).
- Penrose, Edith T. (1959). *The Theory of the Growth of the Firm* (Oxford: Basil Blackwell).
- Redding, S. G. (1990). *The Spirit of Chinese Capitalism* (Berlin: de Gruyter).
- Robertson, Paul L. and Alston, Lee J. (1992), "Technological Choice and the Organization of Work in Capitalist Firms", *Economic History Review* 45, 330-349.
- Salsbury, Stephen and Sweeney, Kay (1988). *The Bull, the Bear and the Kangaroo: The History of the Sydney Stock Exchange* (Sydney: Allen & Unwin).
- Salsbury, Stephen and Sweeney, Kay (1992). *Sydney Stockbrokers: Biographies of Members of the Sydney Stock Exchange 1871 to 1987* (Sydney: Hale & Iremonger).
- Sayers, R. S. (1976). *The Bank of England, 1891-1944* (Cambridge: Cambridge University Press, 1976).
- Scammell, W. M. (1968). *The London Discount Market* (London: Elek Books).
- Seabright, Paul (2004). *The Company of Strangers: A Natural History of Economic Life* (Princeton: Princeton University Press).
- Smith, Adam (1776 [1937]). *An Inquiry into the Nature and Causes of the Wealth of Nations*, Edwin Cannan, ed. (New York: Modern Library).
- Smith, B. Mark (2003). *A History of the Global Stock Market: From Ancient Room to Silicon Valley* (Chicago: University of Chicago Press).
- Sobel, Robert (1965). *The Big Board: A History of the New York Stock Market* (New York: Free Press).

- Sobel, Robert (1970). *The Curbstone Brokers: The Origins of the American Stock Exchange* (New York: Macmillan).
- Swedberg, Richard (2000), "Afterword: The role of the market in Max Weber's work", *Theory and Society* 29, 373-384.
- Thompson, Graeme, Frances, Jennifer, Levačić, Rosalind, and Mitchell, Jeremy, eds. (1991). *Markets, Hierarchies and Networks: The Coordination of Social Life* (London: Sage).
- Ungson, Gerardo R., Steers, Richard M., and Park, Seung-Ho (1997). *Korean Enterprise: The Quest for Globalization* (Boston: Harvard Business School Press).
- Vidal, E. (1910). *The History and Methods of the Paris Bourse* (National Monetary Commission, 61st Congress, 2d Session, Senate, Document No. 573 (Washington: Government Printing Office.))
- Weber, Max (2000 [1894]), "Stock and Commodity Exchanges [Die Börse]", *Theory and Society* 29, 305-338.
- Williamson, Oliver E. (1975). *Markets and Hierarchies: Analysis and Antitrust Implications* (New York: Free Press).
- Williamson, Oliver E. (1985). *The Economic Institutions of Capitalism* (New York: Free Press).
- Williamson, Oliver E. (1993), "Calculativeness, Trust, and Economic Organization", *Journal of Law and Economics* 36, 453-486.

¹ Coase (1993a [1988]) also mentions Salter's passage in his fiftieth anniversary account of the origins of his article.

² Economists are, of course, not the only people who have been concerned with defining markets. Max Weber, for instance, gave considerable attention to the issue, in the end deciding that markets have "an amorphous structure" (quoted in Swedberg (2000), p. 379).

³ For a thought-provoking and controversial discussion of the meaning of "market" and "marketplace" from a sociological standpoint, see Callon (1998) .

⁴ As support, Geroski (1998) quotes Buzzell (1978, 3): "there is no single correct way to define the market for a given business unit . . . a market not only can but should be defined in several different ways."

⁵ See, for instance, the discussion of changes in the range of goods traded in various U.S. futures exchanges in Carlton (1984).

⁶ This is not to imply that the people who established and later fine tuned the operations of specialized models consciously used economic theory as a guide, especially since a number of the markets were founded before economists had codified the benefits of high levels of competition. As practitioners, however, the leaders or managers of these markets were aware of their practical needs as traders, needs that were eventually codified by generations of microeconomists.

⁷ Near the end of the seventeenth century, for instance, the City of London licensed "brokers" but did not stipulate what products each was to deal in (Morgan and Thomas, 1962).

⁸ A lack of correspondence in the degrees of specialization and integration of different factors of production may affect the division of labor in other respects. For example, over the past two centuries the integrative capacity of machinery to perform many tasks has had serious effects on the scope of activities of individual workers (Ames and Rosenberg, 1965; Robertson and Alston, 1992). As technologies for integrating markets are perfected, they can also be expected to bring organizational changes, a trend that is already well established.

⁹ Baldwin and Clark have referred to these as “mundane transaction costs”, but their importance is defended in Jacobides (2005) and Langlois (forthcoming).

¹⁰ As quoted in Macneil (1981, 1022).

¹¹ Which is not to imply that internalization is useless. Among other things, it may allow a firm to select which markets in which it does business both as a buyer or a seller, permitting it to choose ones in which transaction costs are relatively modest (and competitive conditions relatively favorable, as in Porter’s (1980) five forces model).

¹² Better flows of knowledge and information can provide both *ex ante* and *ex post* remedies to opportunism, but other *ex ante* controls may also be valuable in eliminating opportunism and thus reducing the need for, and the costs of, monitoring transactions (Lindenberg, 2000).

¹³ That is, to a level at which transaction costs are smaller than the gains that arise from using markets rather than alternative arrangements.

¹⁴ Many of the same attributes are relevant in determining patterns of organization in family firms (Colli, 2003), but business relationships among relatives can also be established on an *ad hoc* basis.

¹⁵ Moreover, as Lindenberg (2000) points out, emotional blackmail and other tactics can lead to profits and losses being distributed in ways that do not correspond to the original amounts contributed or to the distributions that would be expected when dealing with outsiders.

¹⁶ At this point, Williamson's argument reduces to a semantic quibble. Some people might prefer, for example, to say that blind trust is not trust at all but "faith".

¹⁷ This view of trust closely parallels Weber's formulation of the sort of social action that takes place when transacting in a market environment (Swedberg, 2000).

¹⁸ As there are other types of transaction costs than opportunism, it would still not be costless to use markets. Still, if we somehow know who is and is not well disposed towards us and can identify who is likely to pose a threat, this would not only reduce the probable loss that might arise directly from being cheated but also the costs associated with monitoring for opportunism and perhaps some of the costs involving in checking out potential colleagues before entering into a transaction.

¹⁹ For China, see Redding's work (1990). Lie (1998) claims that South Korea has been aiming for national homogenization but this has not totally discouraged reliance on peer groups at more micro levels. See also Ungson, *et al.* (1997).

²⁰ Ouchi (1984, 25) contends that a clan involves "the permanence of a blood relation between fellow employees ... A clan is an organization in which the members are bound together over a very long run." He acknowledges, however, that "even familiar clans are rife with conflict and disagreement ...".

²¹ More recently, firms operating in a market may still have unlimited liability for debts even though they are incorporated and the debt of their owners is limited. Managers are

understandably reluctant to allow their firms to go bankrupt despite the boundaries on damage suffered by the firms' owners.

²² For more complete accounts of the development of the London and New York Stock Exchanges, see Michie (1987, 1988, and 1999), Morgan and Thomas (1962), Sobel (1964), and Geisst (2004). These exchanges did not provide the only model for development. As Weber (2000 [1894]) discusses, their high degree of self-regulation contrasted sharply with the greater degree of government regulation common on the Continent.

²³ The operations of stock exchanges are also affected by other types of transaction costs than those considered here (Green, et al., 2000).

²⁴ Weber (2000 [1894]) distinguishes an exchange from a market on the grounds that its participants are traders acting as agents rather than members of the general public. He argues that the advantage that separates these traders from other who, in the absence of regulation, might try to deal directly in a particular security or commodity is that the professional traders have superior specialized knowledge that they are willing to share with others for a relatively modest fee.

²⁵ "Tontine" was a reasonable name for the site of a securities market. Until the nineteenth century, shares in financial schemes such as lotteries and tontines were traded as securities, and lotteries were among the sweeteners that the British government used to induce people to finance the national debt (Morgan and Thomas, 1962).

²⁶ Nevertheless, the public also benefited. The regular posting of prices, for example, set benchmarks against which sellers and purchasers could assess any bargains that they entered into.

²⁷ See the following volumes in the archives of the LSE, which are deposited in the Guildhall Library in London: Minutes of the Committee for General Purposes, Ms 14600, Vol. 78 (19 July, 1905-15 March, 1906), pp. 135, 357-64; Minutes of the Sub-Committee for Rules and Regulations, Ms 14612, Vol. 2 (1894-1900).

²⁸ For an exegesis on the *Rules and Regulations* as they stood at the turn of the twentieth century, see Chiswell (1902).

²⁹ Before declining to 4,855 in 1914 (Michie, 1987).

³⁰ This prohibition, which was in force from the early years of the LSE, also applied to members' spouses (London Stock Exchange, 1812).

³¹ London Stock Exchange, Minutes of the Committee for General Purposes, Ms 14600, Vol. 72 (30 September, 1901-6 May, 1902), meeting of 28 October, 1901.

³² After merging with the Open Board in 1869, the NYSE had 1,060 members, a number that had increased by only 40 in 1914 (Sobel, 1965; Michie, 1987).

³³ For example, in its early years, the London Stock Exchange explicitly declined to deal in foreign securities. These continued to be traded at the Royal Exchange until a Foreign Stock Exchange was founded in the early 1820s. This was then absorbed shortly afterwards into the LSE (Morgan and Thomas, 1962; Smith, 2003).

³⁴ Much of the material in the following paragraphs is drawn from copies of the *Rules or Rules and Regulations of the Sydney Stock Exchange* that are held in the archives of the Australian Stock Exchange. I am grateful to Ms. Pam Spies, the Archives and Records Manager of the ASX, for her help and advice.

³⁵ A guinea was 21 shillings, or £1.05.

³⁶ The word “extensively” was not in the original 1875 printed rules but was inserted sometime between then and 1881.

³⁷ Although misfortunes of close members of the families of brokers could still have been disruptive.

³⁸ It is less clear that the stricter requirements were very effective in producing a better quality of member. Ten of the 33 members who joined between 1875 and 1889 were either expelled subsequently or allowed to resign because they had defaulted in business with other members of the SSE (Salsbury and Sweeney, 1988 and 1992).

³⁹ The handwritten note, opposite p. 9 of the ASX copy, reads, “Rule 31 30/9/04 amount of Entrance fee suspended until 5 new M’bers have been elected at a fee of £600 under such Rule.” *Rules of the Sydney Stock Exchange Adopted 9th May, 1904, with Additions & Amendments to 10th June, 1904.*

⁴⁰ Rules of the Sydney Stock Exchange, with Additions and Amendments to 16th February, 1921, Rule 31, p. 18. The target figure of 72 members indicates how small the SSE was in comparison to exchanges in London and New York.

⁴¹ Because the Entrance Fee was also the benchmark for the price at which seats changed hands, members were able to increase their own wealth by manipulating the Entrance Fee – assuming that there was sufficient demand for seats.

⁴² With an area of approximately two square miles, the City of Sydney was a very small part of the Sydney region, let alone of New South Wales as a whole. An exemption was made for the Adelaide firm of S. C. Ward & Co. that had long had a partner as a member of the SSE.

⁴³ A major difference between the cases discussed here and by MacKenzie and Millo (2003), on the one hand, and by Jacobides (2005), on the other, is that the type of outsourcing described by Jacobides has not led in many cases to the creation of “manageable” markets, even though the trading undertaken is often subject to *external* regulation. Michie (2001) and Weber (2000 [1894]) may provide a clue to these differences when they define exchanges to involve deals among traders (agents) rather than among producers and final customers. It will be interesting to see if new communications methods change this is the case of mortgage brokers, for example, who need to maintain close contact with customers in highly diverse circumstances.