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Transaction cost: a literature overview

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Introduction

The total costs of production consist of the resource inputs of land, labour, and capital involved both in transforming the physical attributes of a good (size, weight, colour, location, chemical composition, and so forth) and in transacting - defining, protecting, and enforcing the property rights to goods. Once we recognize that transaction costs are costs like transportation, marketing, or any other we require a new analytical framework of microeconomic theory since analytical tools of neoclassical economics have frequently been used for economic analysis of social and economic issues in total disregard of transaction costs and incentives specific to alternative institutional arrangements. This work is concerned with a historical overview of transaction costs; it examines how the concept of transaction costs was born and evolved through the past decades and how various authors viewed this new theory. In the first session we present some important points on the subject of the work of Coase who was the man that opened the door for the theory of transaction costs. The second session is concerned with the contribution of Williamson who was one of the authors that developed transaction cost economics as introduced by Coase. In the third and fourth sessions we are concerned with the association between transaction costs, market efficiency and the costliness of information. The fifth and sixth sessions examine measurement and enforcement costs, which are considered by many authors as the sources of social, political, and economic institutions. In the last two sessions we present various factors that bring about changes in the cost of transacting, and some empirical estimates of the transaction sector in the United States economy.

The foundations of transaction cost economic theory

The first man who forced economists to think about the costs involved in human interaction was Ronald Coase. He actually wrote: 'The reason why economists went wrong was that their theoretical system did not take into account a factor which is essential if one wishes to analyze the effect of a change in the law on the allocation of resources. This missing factor is the existence of transaction costs.' He introduced the notion of transaction costs in his article "The nature of the firm" that was published in 1937 although he did

not use this terminology. There he supports that the main reason why it is profitable to establish a firm would seem to be that there is a cost of using the price mechanism. (The price mechanism: the price of factor A becomes higher in X than in Y. As a result, A moves from Y to X until the difference between the prices in X and Y, except in so far as it compensates for other differential advantages, disappears.). This cost, according to Coase, can be reduced to a number of factors: (a) the cost of discovering prices (this cost may be reduced but it will not be eliminated by the emergence of specialists who will sell this information) and (b) the costs of negotiating and concluding a separate contract for each exchange transaction which takes place on a market. In addition, there is a further cost of the price mechanism with long-term contracts because forecasting, and consequently contract specification, problems inevitably exist. Coase argues that 'it may be desired to make a long-term contract for the supply of some article or service. This may be due to the fact that if one contract is made for a longer period, instead of several shorter ones, the certain costs of making each contract will be avoided. Or, owing to the risk attitude of the people concerned, they may prefer to make a long rather than a short-term contract. Now, owing to the difficulty of forecasting, the longer the period of the contract is for the supply of the commodity or service, the less possible, and indeed, the less desirable it is for the person purchasing to specify what the other contracting party is expected to do.' Therefore, he concludes, it is more efficient to use contracts that define general limits and responsibilities.

Coase finds it improbable that a firm would emerge without the existence of uncertainty, that is he finds that the cause of the existence of transaction costs is uncertainty. In accordance to Coase, Paul Milgrom and John Roberts argue that uncertainty about what circumstances will prevail when future actions must be taken is the primary factor that makes complete contracting impossible. Greater uncertainty about what future actions will be appropriate makes rigid contracts, which recognize few contingencies, more likely to lead to bad decisions; they are therefore more costly. Flexible contracts, too, entail costs. They are, of necessity, open to different interpretations and thus to effective renegotiation. In this context, Coase's hypothesis is that parties will normally agree on the contractual arrangements in which these costs are minimised.

In his later work "The problem of social cost" that was published in 1960 Coase suggests that in order to carry out a market transaction it is necessary to discover who it is that one deals with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up a contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on. He finds these operations are often extremely costly, sufficiently costly at any rate to prevent many transactions that would be carried out in a world in which the pricing system worked without cost. Coase, therefore, concludes that the operation of a market costs something and by forming an organization and allowing some authority ('an

entrepreneur') to direct resources, certain marketing costs are saved. However, in this work Coase admits that administrative costs of organizing transactions may also exist within the firm and that they may also be high and particularly so when many diverse activities are brought within the control of a single organization. That is, he distinguishes the costs of organizing resources across markets (transaction costs) from the costs of organizing resources within firms (management costs). Besides, he claims, exchange transactions on a market and the same transactions organized within a firm are often treated differently by governments or other bodies with regulatory powers. Recent writers on the theory of the firm, though, use 'transaction cost' to refer indiscriminately to organizational costs whether arise from within the firm or across the market.

Besides, B. Klein, R. Crawford and A. Alchian (1978) claim that Coase's primary distinction between transactions made in the marketplace may often be too simplistic, since many long-term contractual relationships (such as franchising) blur the line between the market and the firm and suggest that it may be more useful to examine the economic rationale for different types of particular contractual relationships in particular situations and consider the firm as a particular set of interrelated contracts.

Although Coase was the first man who introduced the notion of transaction costs, Kenneth Arrow was the first author to use the term 'transaction costs' and has defined them as the 'costs of running the economic system' (1969). In Arrow's formulation transaction costs, in particular circumstances, block the formation of markets, i.e. lead to market failures. M. Dietrich (1994) argues that inspite the fact that this may be true and is therefore an improvement on the Coasian framework, the claim presents problems because if markets cannot exist, it is an analytical sleight-of-hand to impute costs of running them. Hence, he suggests, that this framework is need of development.

The contribution of Williamson

As Coase's major idea -that firms arise to economize on transaction costs- was increasingly accepted, the exact nature of these transaction costs, however, remained unclear. What lay beyond the learning and haggling costs that, according to Coase, are a major component of market transactions? Professor Oliver Williamson has offered a deep and far-reaching analysis of these costs. Williamson recognized that transaction costs may assume particular importance in situations where economic actors make relationship-specific investments - investments to some extent specific to a particular set of individuals or assets. Examples of such investments include locating an electricity generating plant adjacent to a coal mine that is going to supply it; a firm's expanding capacity to satisfy a particular customer's demands; training a worker to operate a

particular set of machines or to work with a particular group of individuals; or a worker's relocating to a town where he has a new job.

Williamson argues that if transaction costs were negligible, the organization of economic activity is irrelevant, since any advantages one mode of organization appears to hold over another will simply be eliminated by costless contracting. He follows Arrow's definition of transaction costs as the costs of running the economic system, and as such they are equivalent to friction in physical systems. He actually wrote: 'The manifold successes of physics in ascertaining the attributes of complex systems by assuming the absence of friction scarcely require recounting here. Such a strategy has had obvious appeal to the social sciences. Unsurprisingly, the absence of friction in physical systems is cited to illustrate the analytical power associated with "unrealistic" assumptions. But whereas physicists were quickly reminded by their laboratory instruments and the world around them that friction was pervasive and often need to be taken expressly into account, economists did not have a corresponding appreciation for the costs of running the economic system. There is, for example, no reference whatsoever to transaction costs as the economic counterpart of friction, in Milton Friedman's famous methodological essay (1953) or in other postwar treatments of positive economics. Thus although positive economics admitted that frictions were important in principle, it had no language to describe frictions in fact.'

Two types of transaction costs are usefully distinguished by Williamson. First, the cost of drafting, negotiating, and safeguarding an agreement (*ex ante* costs). This can be done with a great deal of care, in which case a complex document is drafted in which numerous contingencies are recognized, and appropriate adaptations by the parties are stipulated and agreed to in advance. Or the document can be very incomplete, the gaps to be filled in by the parties as the contingencies arise. Rather, therefore, than contemplate all conceivable bridge crossings in advance, which is a very ambitious undertaking, only actual bridge-crossings choices are addressed as events unfold.

Williamson identifies several forms of *ex post* costs of contracting. These include the maladaptation costs incurred when transactions drift out of alignment with requirements -in relation to what Masahiko Aoki refers to as the "shifting contract curve", the haggling costs incurred if bilateral efforts are made to correct *ex post* misalignments, the setup and running costs associated with the governance structures (often not the courts) to which disputes are referred, and the bonding costs of effecting secure commitments.

In accordance to Williamson, Matthews (1986) offers the following definition: 'The fundamental idea of transaction costs is that they consist of the cost of arranging a contract *ex ante* and monitoring and enforcing it *ex post*, as opposed to production costs, which are the costs of executing a contract.'

Williamson argues that the existence of transaction costs depends on three factors: bounded rationality, opportunism, and asset specificity. Bounded rationality is the cognitive assumption on which transaction cost economics relies. This concept is based on two principles, as Dietrich points out: (1) Individuals, or groups of individuals, have inevitable limits on their abilities to process or use information that is available. This limited computational capacity exists because of difficulties in understanding and manipulating the sense data involved in any but trivial situations. In short *informational complexity* exists. (2) It is equally implausible to suggest that all possible states of the world and all relevant cause-effect relationships can be identified, following which, probabilities can be calculated, presumably on the basis of previous occurrence. This implies that economic actors are inevitably faced with incomplete information, i.e. *informational uncertainty* exists. Thus, bounded rationality is a semistrong form of rationality in which economic actors are assumed to be *intendedly* rational, but only *limitedly* so. Dietrich argues that Williamson claims to base his work on bounded rationality, but this is a one-sided use of the concept which is restricted to informational uncertainty. In the absence of complexity, all information that is available can be used, which implies unproblematic, if limited, understanding of reality. In such a situation, he continues, disagreements are based on different information inputs and objectives or preferences, not different understanding. With informational complexity individuals must make sense of their world, hence differences of understanding, even with the same information, can exist. He concludes that if informational complexity is assumed not to exist, bounded rationality issues can be conceptualized in terms of minimizing information costs, which is equivalent to economizing on transaction costs. Such an approach is the dual of profit maximization, according to Boland (1981). But with complexity present, an unproblematic cost minimization/profit maximization is not possible, Dietrich supports.

Opportunism describes self-interest seeking with guile. This includes lying, stealing, and cheating. According to Pejovich, opportunism follows from bounded rationality and self-interest. Armen Alchian and Susan Woodward defined opportunism and its implications for transaction costs as follows: 'When a conflict arises between what people want and what they have agreed to do for others, they will act in their own interest insofar as it is costly for others to know their behaviour (others face costly information)...Opportunism covers more than the propensity for mutually reliant parties to mislead, distort, disguise, obfuscate, or otherwise confuse in order to expropriate wealth from one another. It includes honest disagreements. Even when both parties recognize the genuine goodwill of the other, different but honest perceptions can lead to disputes that are costly to resolve.' Opportunism is responsible for real or contrived conditions of information asymmetry, according to Williamson

while on the other hand, Dietrich argues that opportunism does not cause information asymmetry and that the latter exists because of bounded rationality.

Asset specificity refers to the degree to which durable human or physical assets are locked into a particular trading relationship, and hence the extent to which they have value in alternative activities. Some useful examples are provided by P. Milgrom and J. Roberts (1987) concerning a firm that rents a computer system and invests in software and training for the employees who will use the system. If an identical or perfectly compatible computer cannot be rented or purchased from another source, the software and employee training are specialized assets because they would lose much of their value if the firm switched to another computer system. A supplier who acquires specialized dies or locates a plant near a customer's remote factory has similarly invested in specialized assets. Klein, Crawford, and Alchian (1978) have dubbed the profits an investor stands to lose from terminating a particular business relationship "appropriable quasi-rents". Logically, although quasi-rents may exist any time costs have already been sunk, appropriable quasi-rents exist precisely when they are specialized assets, Milgrom and Roberts argue.

Williamson emphasizes that if bounded rationality, opportunism and asset specificity are not all present, transaction costs will not exist. M. Dietrich comments: 'Consider the case of global rationality: in such situation it would be possible to costlessly construct completely specified contracts at the outset, long-term contracting is possible. In the absence of opportunism, any gaps that exist in contracts, because of bounded rationality, will not pose execution hazards because neither party will attempt to gain advantage over the other: short-term, sequential contracting is possible. When asset specificity does not exist there is no need to have continuing economic relationships, hence markets will be fully contestable'. And he continues: 'These examples indicate the bounds of the orthodox analysis of markets. Outside of these bounds institutional arrangements to manage resource allocation are more complex.'

Do transaction costs generate market failure?

It has been argued by many (Arrow was one of them as mentioned above) that all market failure is caused by transaction costs. Dahlman (1979) defines transaction costs as the cause that generates externalities, which have been viewed as a cause of market failure, or as synonymous with market failure. He argues that the relevance of externalities must lie in the fact that they indicate the presence of some transaction costs, since if there were no costs of transacting, then the potential Pareto improvement could be realized by costless bargaining between self-interested economic agents.

Dahlman gives three possible definitions of transaction costs but only the third one, he argues, is consistent with the notion of externalities: (1) A fixed proportion of whatever is being traded is assumed to disappear in the transaction itself; this is analogous to a transportation cost, and it is simple to handle with mathematical tools. (2) There may be setup costs associated with each exchange. Such a cost is no longer proportional to the trade itself, but it is a fixed cost which is independent of the amount to be exchanged. But the fixed cost of any trade is really endogenously determined as a known and adjusted cost of “producing” the exchange.

Neither of the above definitions is consistent with the notion of externalities. The third definition of Dahlman’s transaction costs is consistent with Coase’s definition in his later work that was mentioned above but it is even more difficult to handle with mathematical tools: ‘In order for an exchange between two parties to be set up it is necessary that the two search each other out, which is costly in terms of time and resources. If the search is successful and the parties make contract they must inform each other of the exchange opportunity that may be present, and the conveying of such information will again require resources. If there are several economic agents on either side of the potential bargain to be struck, some costs of decision making will be incurred before the terms of trade can be decided on. Often such agreeable terms can only be determined after costly bargaining between the parties involved. After the trade has been decided on, there will be the costs of policing and monitoring the other party to see that his obligations are carried out as determined by the terms of the contract, and of enforcing the agreement reached. These, then, represent the first approximation to a workable concept of transaction costs: (a) search and information costs, (b) bargaining and decision costs, (c) policing and enforcement costs.’ Dahlman, though, supports that ‘the three classes reduce to a single one - for they all have in common that they represent resource losses due to lack of information. Both search and information costs owe their existence to imperfect information about the existence and location of trading opportunities or about the quality or other characteristics of items available for trade. The case is the same for bargaining and decision costs: these represent resources spent in finding out the desire of economic agents to participate in trading at certain prices and conditions, and decision costs are resources spent in determining whether the terms of the trade are mutually agreeable. Policing and enforcement costs are incurred because there is lack of knowledge as to whether one (or both) of the parties involved in the agreement will violate his part of the bargain. ... Therefore it is really necessary to talk only about one type of transaction cost: resource losses incurred due to imperfect information.’

Although Dahlman identifies the above three possible interpretations of the nature of transaction costs, Dietrich argues that if attention is restricted to firms, rather than final consumers, these factors can be recast in terms of the management costs associated with the construction and enforcement of

contracts. This, he continues, allows transaction costs to be viewed like production costs and analysed accordingly.

‘But is it true that all three classes of Dahlman’s transaction costs represent resource losses due to lack of information?’ Papandreou raises the question. He argues that the third class, policing and enforcement costs, seems less likely to be reducible to information costs. Therefore, he argues that high transaction costs as defined by Dahlman would not necessarily imply market failure since the ultimate origin of market failure would seem to be information. He identifies two categories of enforcement costs that ‘Dahlman seems to exclude and that cannot be reduced to information costs’:

(1) *Costs of enforcing entitlements* (defining, distributing, and protecting property rights). Papandreou argues that property rights are not fully defined because of the presence of enforcement costs and these costs will not always be eliminated by full information. North, in the same direction, supports that rights are never perfectly specified and enforced; some valued attributes are in the public domain and it pays individuals to devote resources to their capture. Because the costs of transacting have changed radically throughout history and vary equally radically in different contemporary economies, North continues his argument, the mix between the formal protection of rights and individual attempts to capture rights or devote resources to individual protection of their own rights varies enormously.

(2) *Costs of enforcing agreement* (secondary entitlements). These are the costs of getting people to agree on the share of benefits arising from an exchange. Papandreou concludes that zero transaction cost - that include the two enforcement costs mentioned above - implies efficient economy and a world without institutions.

H. Demsetz in his paper “The exchange and enforcement of property rights” (1964) raises the question of how transaction cost is to be defined, and that question is of two sorts: (a) Should the cost of enforcing agreements be a transaction cost? (b) Should the cost of avoiding the ‘under-revelation’ of demand (as when collective goods are purchased) be a transaction cost? His preference is for a more restricted definition, dealing with the cost of negotiating. Otherwise, he claims, we come seriously close to a definition of transaction cost that amounts to ‘the cost of solving a problem’. In “The cost of transacting” (1968) Demsetz defines transaction cost as the cost of exchanging ownership titles. He characterizes transaction costs as the core of an economic theory of money and he argues that exchange will tend to be conducted in ways that economize on the cost of transacting. In the specific case of the New York Stock Exchange, which is of concern in his article, he defines transaction cost as the cost of exchanging titles to money and to shares of stock. Following his words: ‘It is possible to increase or decrease this cost by a more or less inclusive

definition of which activities are to be counted as transaction activities. From one viewpoint, the cost of producing assets is necessary to the exchange of assets, whereas from another viewpoint, only titles to assets need be produced for exchange to take place-the production of the assets themselves can be postponed indefinitely. And one could include in transaction cost the cost of being informed about general nature of the market-the cost of making phonecalls to one's broker or of reading the financial pages.' Thus, in his paper he defines transaction cost as the cost of using the New York Stock Exchange to accomplish a quick exchange of stock for money because broader interpretations, he argues, lead to extremely difficult empirical and conceptual problems. On the New York Stock Exchange, according to Demsetz, two elements comprise almost all of transaction cost: brokerage fees and ask-bid spreads.

He argues that the usual sources of inefficiency fail to exist in an economic system in which transaction cost is zero. He also supports that the existence of positive transacting cost has no direct relevance to economic inefficiencies; as with any cost, the question that is relevant for efficiency is whether or not the cost is appropriately economized. In some cases, he supports, it will be efficient to have markets in which negotiations are carried forth to bring costs and benefits to bear on economic decision units. The value of realigning resources as a result of such negotiations is expected to be worth the cost of transacting. In other cases, he continues his argument, it will be efficient not to negotiate; in a world of positive transacting cost some external and monopoly effects are consistent with efficiency.

In the same direction with Dahlman and Papandreou, Eggertsson argues that transaction costs are in one way or another associated with the cost of acquiring information about exchange, though the concepts of information costs and transaction costs are not identical. To illustrate this, he gives the following example: a loney person on a desert island will encounter information costs as he goes about his 'home production', but an isolated individual does not engage in exchange and therefore will have no transaction costs. When information is costly, various activities -like the search for information about the distribution of price and quality of commodities and labour inputs, the search for potential buyers and sellers, the bargaining process, the making and enforcement of contracts, the monitoring of contractual partners, and the protection of property rights- related to the exchange of property rights between individuals give rise to transaction costs. Eggertsson supports that in the absence of transaction costs, their self-interest would always guide the members of society to contract for the establishment of political structures and systems of property rights that maximize the national wealth. He introduces the term Neoinstitutional Economics, an analysis that examines the consequences of positive transaction costs and the constraints of rules and contracts that govern exchange. He supports that the cost of transacting makes the assignment of ownership rights

paramount, introduces the question of economic organization (as Williamson supported), and makes the structure of political institutions a key to the understanding of economic growth. He defines transaction costs as the costs that arise when individuals exchange ownership rights to economic assets and enforce their exclusive rights. He considers them as opportunity costs and categorize them in fixed and variable transaction costs.

Milgrom and Roberts claim that the key to evaluating the efficacy of market transactions is the costs of negotiating suitably detailed short-term contracts. If these costs were always zero, then organizing economic activity through market exchange would always be perfectly efficient. On the other hand, they continue their argument, when the costs of negotiating periodic exchange agreements are sufficiently high, then regardless of the other factors, such as the presence or absence of specialized assets, potentially important savings are to be realized by placing the activity under a central authority, which can quickly settle potentially costly disputes.

In their article “Bargaining costs, influence costs, and the organization of economic activity” (1987) they give a more verbal definition of the term transaction costs:

‘Transact, as an intransitive verb, means “to do business with; negotiate”. Transaction costs encompass the costs of deciding, planning, arranging, and negotiating the actions to be taken and the terms of exchange when two or more parties do business; the costs of changing plans, renegotiating terms, and resolving disputes as changing circumstances may require; and the costs of ensuring that parties perform as agreed. Transaction costs also include any losses resulting from inefficient group decisions, plans, arrangements or agreements; inefficient responses to changing circumstances; and imperfect enforcement of agreements. In short, transaction costs include anything that affects the relative performance of different ways of organizing resources and production activities.’ They support that the crucial costs associated with using markets to carry out transactions (rather than bringing them within a more complex, formal organization) are the costs of bargaining over short-term arrangements between independent economic agents. When describing contracts “short-term” refers to a period short enough so that all the information that is relevant for current decisions is already available. They interpret “bargaining costs” to include all the costs associated with multilateral bargaining, competitive bidding, and other voluntary mechanisms for determining a mutually acceptable agreement. Bargaining costs include not only the wages paid to the bargainers or the opportunity costs of their time, but also the costs of monitoring and enforcing the agreement and any losses from failure to reach the most efficient agreement possible in the most efficient fashion. With these definitions, having zero short-term bargaining costs means that the bargainers require negligible physical and human resources to reach efficient

short-term contracts. Thus, they conclude that if the costs of bargaining over short-term arrangements were zero then the market outcome would be efficient.

Milgrom and Roberts emphasize that the cause of bargaining costs are specialized assets. They identify as the first class of bargaining costs, coordination failures which arise in situations where individuals could adopt several different patterns of mutually consistent, self-interest behaviour and where market institutions fail to ensure that only efficient patterns actually emerge. Measurement (information acquisition) costs are a second source of bargaining inefficiencies (we explore the nature of these costs in a following section). A third source of bargaining costs, according to Milgrom and Roberts, (and the one most often emphasized in the recent theoretical literature), is private information about preferences. Unless the parties' valuations of a good being traded are common knowledge, the parties may be delayed in reaching agreement or may even fail to agree at all, because they may strategically misrepresent the good's value.

Cost of collecting information

Following the words of Pejovich, 'information about exchange opportunities is not a free good'. In a world of uncertainty and incomplete knowledge, it takes real resources (including time) to produce information. College graduates know that it takes time and money to gather information about employment opportunities, but the search costs might prevent them from discovering the best alternative. Shoppers know that by driving around they can find the best bargains, but it might not be an efficient thing to do given the cost of gasoline and the alternative uses for their time. However, if the price at which a person can obtain additional information is reduced, additional exchange opportunities would be exploited and the extent of exchange increased. In a private-property, free-market economy, resources are devoted to producing and selling information. According to Pejovich real estate agents, employment agencies, advertising, marriage and dating bureaus, and scalpers are all engaged in the production of transaction services. Stores maintain inventories because it is a method for reducing the cost of information about fluctuations in the demand for their goods. The so-called 'sticky' prices are a strategy on the part of the seller to reduce the cost of information to the buyer about the terms of exchange, Pejovich argues. It explains nothing to say that sticky prices, that is prices which do not respond to temporary fluctuations in demand, are a consequence of monopoly power, he supports.

Information costs depends on product homogeneity, spatial distribution of production, and technical complexity, A. Schmid (1987) argues. He supports that information costs viewed under the broader heading of transaction costs

have a different role from the role of information in a production function and that the use of this term refers to information necessary for a transaction rather than physical production. He also argues that property rights have a great deal to do with who has to bear the costs of acquiring information about product (and input) price and quality now and in the future, how large the costs will be, and ultimately the costs of mistakes made. Property rights and different forms of organization can reduce the costs of information to given parties, but, in some cases, he admits, the only thing rights can do is distribute the costs of being wrong because nothing can do to reduce uncertainty. Information costs, he continues, cannot be minimized in isolation since one person's information lack is another's source of income, and, if one person is to have more future options, another has less in the future or present.

Alchian is another author that viewed transaction costs as the costs of collecting information. He supports that nobody knows as much as he would like (at zero cost) about everyone else's offers and demands (including the properties of goods offered or demanded), but at a cost, more information can be acquired. Discovery of the variety of bids and offers and the best path or sequence of actual exchange prices toward an 'equilibrium' requires costly search over the population. So, a large and costly portion of so-called marketing activity is information dissemination -advertisements, window displays, sales clerks, specialist agents, brokers, inventories, catalogs, correspondence, phone calls, market research agencies, employment agencies, licensing, certification are only a few examples. He adds to the catalog of activities that give rise to transaction costs 'buffer inventories' by sellers, queueing of buyers and the provision of price predictability.

In the same direction, North links transaction costs to the costliness of information. According to North (1990) an economic definition of transaction costs is the costs of measuring what is being exchanged and enforcing agreements. In a later work ("Transaction costs through time" 1997) he defines transaction costs in the larger context of societal evolution as all costs involved in human interaction over time. He views transaction costs combined with the theory of human behaviour as the cause of the existence of institutions. He agrees with Eggertsson that the costliness of information is the key to the costs of transacting, which, he argues, consist of the costs of measuring the valuable attributes of what is being exchanged and the costs of protecting rights and policing and enforcing agreements. He considers these measurement and enforcement costs as the sources of social, political, and economic institutions. North explores the costliness of measurement, following the beginner of such a theory, Yoram Barzel. Since these measurement costs have been a 'favourite' subject for other authors as well, we will try to explore their nature in the following section.

Measurement costs

It is true that we get utility from the diverse attributes of a good or service or, in the case of the performance of an agent, from the multitude of separate activities that constitute performance. Consider the purchase and the consumption of an orange. We get utility from the quantity of its juice, the amount of vitamin C it contains, and its flavour. Similarly, the purchase of a used automobile is combined with the purchase of its hundreds of qualitative margins (colour, acceleration, style, interior design, mechanical condition, etc.). The value of an exchange to the parties, then, is the value of the different attributes lumped into the good or service. It takes resources in assessing these attributes and in defining and measuring rights that are transferred. The transfers that occur with an exchange entail costs that result from both parties attempting to determine what the valued attributes of these assets are - the seller needs to establish the quality level of the good in order to price it, and the buyer may want to measure the product again to verify that it is of the asserted quality.

Nelson (1970), in a pioneering contribution, has made a distinction between *search goods* and *experience goods*. According to Nelson's definition, the quality of search goods (like dresses) can be established by inspection prior to purchase whereas the quality of pure experience goods (like brands of canned tuna fish) can be measured only by using the product. In practice, a buyer can measure the qualitative dimensions of most commodities through either search or experience, but the preferred way of establishing quality depends on the relative costs of the alternative methods of measurement. In general, the information costs in ascertaining the level of individual attributes of each unit exchanged underlie the costliness of this aspect of transacting. Even if all exchanging individuals had the same objective function, there would still be the transaction costs involved in acquiring the necessary information about the levels of attributes of each exchange unit, the location of buyers or sellers, and so forth. But, in fact there are asymmetries of information among the parties and much more, each party may stand to gain by concealing the piece of information that the other ignores. In the foregoing illustrations, the seller of oranges knew much more about the valuable attributes of the oranges than the buyer, and the same goes for the used car dealer. According to a strictly wealth-maximizing behavioral assumption, a party to exchange will cheat, steal, or lie when the payoff to such activity exceeds the value of alternative available opportunities. Many authors, such as A. Schmid that was mentioned above, classify these measurement costs under the broader heading of information costs which not only refer to the costliness of knowing how products will perform, but also to the costliness of knowing who is not bearing the load, when you will need a product, or what future demand and supply will be.

According to Neoinstitutional Economics, the costs of measuring quality systematically influence the structure of contracts and the organization of markets and of economic institutions in general since they give rise to various market practices that are designed to lower these measuring costs and minimize the final cost to buyers of commodity. A sampling of activities that arise solely because these costs are positive may hint at how costly the measurement of commodity attributes is. Barzel (1982) uses this idea to explain fruit and vegetable packaging (which discourages product evaluation) and product warranties (which make careful product evaluations less valuable to the buyer, and so reduce measurement activities). He argues that the potential errors in weighing the commodity and in assessing its attributes permit manipulations and therefore require safeguards. Had product information been costless, he continues, warranties would disappear since attribute levels and defects could be effortlessly identified at the time of exchange; fancy packaging (unless valued for its own sake) would be superfluous, as would professional certification and recruiting efforts. Other market arrangements that emerge to reduce these measurement losses are share contracts, brand names, and vertical integration. Kenney and Klein (1983) use this idea of alternative arrangements that economize on these costs to explain the packaging of diamonds and the block booking of movies (which prevents theater owners from picking and choosing among new releases and so economizes on measurement costs). High measurement costs often invite regulation by the state. Many economists suspect that regulation by the state is often motivated by considerations of redistribution rather than a desire to lower costs, and they also argue that when the state genuinely seeks to lower measurement costs, the effects can be quite the opposite because new types of transaction costs and self-serving agents get in the way. Besides, the qualitative attributes of commodities tend to grow more complex with specialization in production and technical change and so do measurement costs.

Costs of enforcement

So far we have analyzed the costliness of information and measurement. We will now return to the costs of enforcement which also determine the costs of transacting. As North argues, enforcement issues arise because we do not know the attributes of a good or service or all the characteristics of the performance of agents and because we have to devote costly resources to try to measure and monitor them. He considers the issue of policing agents and refers to the extreme example of the relationship between a master and a slave. He argues that there is an implicit contract between them; to get maximum effort from the slave, the owner must devote resources to monitoring and metering a slave's output and critically applying rewards and punishments based on performance. Because there are increasing marginal costs to measuring and policing

performance, the master will stop short of perfect policing and will engage instead in policing until the marginal costs equal the additional marginal benefits from such activity. The result is that slaves acquire certain property rights in their own labour. That is, owners are able to enhance the value of their property by granting slaves some rights in exchange for services the owners value more. Hence slaves became owners too. In sum, positive transaction costs, including the costs of monitoring, affect the relative advantage of slavery as a form of productive organization. Eggertsson concludes that transaction costs tend to reduce the relative advantage of slavery because various agency problems and associated costs are either particularly severe or unique to the master-slave relationship. Although the slave example is an extreme form, the agency issue is ubiquitous in hierarchical organizations, North argues. The problems of monitoring and metering the various attributes that constitute performance of agents mean that, in contrast to the standard neoclassical frictionless model of workers being paid the value of their marginal product, they are paid this cost minus the resource costs of monitoring and policing. In the above illustration North implicitly introduced property rights when he referred to the concept of a master owing a slave; and in all discussions of principal/agents and the monitoring problem, he assumes that the principal has the power of disciplining the agent and therefore of enforcing agreements. Likewise, the agent can monitor the principal and enforce his end of the agreement.

North also considers enforcement that can come from second-party retaliation and from internally enforced codes of conduct or by societal sanctions or a coercive third party (the state). He argues, though, that enforcement cannot be taken for granted and that it is the critical obstacle to increasing specialization and division of labour. Enforcement poses no problem when it is in the interests of the other party to live up to agreements. But without institutional constraints, North continues his argument, self-interested behaviour will foreclose complex exchange, because of the uncertainty that the other party will find it in his interest to live up to the agreement. The transaction cost will reflect the uncertainty by including a risk premium, the magnitude of which will turn on the likelihood of defection by the other party and the consequent cost to the first party. Throughout history, he concludes, the size of this premium has largely foreclosed complex exchange and therefore limited the possibilities of economic growth.

The impact of various factors on transaction costs

We have discussed various marketing arrangements that emerge in order to economize on measurement costs. Let us return to the world of costly information and see how various factors can bring about changes in the costs of

transacting. High transaction costs can limit or prevent otherwise advantageous exchange, such as when trade is threatened by a third party (a band of pirates). When a state introduces and enforces the rule of law in a lawless area, it thereby lowers transaction costs and stimulates trade, Eggertsson argues. When it prohibits trade in certain commodities -for example, heroin or antigovernment literature- it raises the cost of exchanging the restricted goods, perhaps to a point where trade is sharply reduced or abandoned altogether. Historically, according to Eggertsson, the state has lowered transaction costs by establishing and maintaining standards of measurement and by introducing and maintaining stable money, because rapid inflation, particularly variable and unpredictable inflation, increases the cost of transacting.

Pejovich supports that market competition and the law of contract jointly reduce transaction costs and especially the costs of negotiating exchange which, as we have seen, can be quite substantial. First, as Pejovich points out, standardized contracts reduce transaction costs by enabling the parties to avoid the cost of negotiating the terms of contract for each and every exchange they make. When I go to a department store to open a credit account, I am invited to sign a contract that offers pre-determined (standardized) set of terms. Competition forces all stores to seek and offer contractual terms that satisfy preferences of the median consumer in their markets. Standardized contracts then emerge spontaneously as a method for reducing the costs of negotiating exchange.

Second, the law of contract allows each party to choose between performing in accordance with the contract or compensating the other party for damages. It is an efficiency-enhancing provision. Pejovich provides a useful illustration: A agrees to produce for B a number of ABC computers. Then a better line of computers (produced by C) becomes available and the market for ABC computers declines. Depending on costs, B can choose to cancel the contract and compensate A only for computers already produced and other sustained costs. This is an efficiency-enhancing provision in the law of contract. The completion of 'unneeded' computers would have used additional resources, which is a waste.

Third, the law of contract reduces transaction costs by preventing opportunistic behaviour. Another related to the subject illustration is given by Pejovich: In *Alaska Packers' Association vs. Domenico*, the defendant hired a group of seamen to fish salmon off the coast of Alaska. The wages to be paid to the seamen were agreed to before the voyage. However, when the ship arrived in Alaskan waters, the seamen refused to work unless they were paid higher wages. Having no access to the labour market, the defendant agreed. But, upon return to San Francisco, he refused to pay his workers higher wages. The seamen sued and lost. The court held that the defendant's promise to pay the wages over and above the original contract was not supported by fresh

consideration (reciprocal promise). This decision was efficiency-enhancing because it reduced incentives for opportunistic behaviours by contractual partners.

The impact of technical change on transaction costs is ambiguous, Eggertsson argues. On the one hand, technical change can help to lower transaction costs by introducing, for example, new and effective methods of measurement, but, on the other hand, technical change is associated with more complex commodities, and hence higher transaction costs. Technical change provides an opportunity to design new structures of economic organization that lower the costs of contracting, but the little systematic empirical evidence that exists suggests that the net effect of technical change has been to increase the cost of transacting in advanced industrial economies.

Eggertsson presents arguments to the effect that money is essentially a device designed to lower transaction costs. He supports that money is an instrument that can lower the ruler's transaction cost of wielding his power. For example, he continues, the payment of taxes in money rather than in kind enlarges the opportunity set of the ruler and his cohorts, and money is an efficient unit of account that lowers the cost of measuring the tax base and the subjects' taxes.

He supports that the choice of an exchange system depends in an important way on the cost of acquiring information about a trading partner and the cost of enforcing contracts. Trade between total strangers has a potential for very high transaction costs, and it can proceed only if the two parties trade easily measurable commodities or use specialized media of exchange whose value is independent of the bearer. He argues that a trader is reluctant to accept credit instruments of no inherent value in return for commodities unless he has reliable information about the buyer. Knowledge that the buyer has invested in trust within a trading community and will lose his valuable reputation if he fraudulently uses worthless instruments lowers the cost of using credit as a medium of exchange. When the trade network is tight, when information about the worth of fellow traders is cheap, when sanctions are inexpensive to administer, and the cost of losing the confidence of the group is high, a specialized medium of exchange may even be inferior to multilateral barter as an exchange mechanism, he concludes.

Empirical estimates of transaction costs

North and Wallis (1986) attempt to measure the changing size of the transaction sector in the U.S. economy between 1870 and 1970. The authors provide estimates for 'the total amount of resources used by firms that sell transaction services in the market, as well as measuring the resources devoted

to transacting within firms that produce other goods and services'. In the private sector, industries that provide transaction services include wholesale and retail trade (but not transportation), finance, insurance, and real estate. Those occupations outside government, which are related primarily to the facilitation, coordination, or monitoring of exchange, are owners, managers, and proprietors (coordination); clerical workers (processing of information); foremen and inspectors (coordination and monitoring of labour inputs); and police and guards (protection of property). According to the authors' estimates, the resource use of the private and public transaction sectors, measured as a share of GNP, grew from roughly one quarter of GNP in 1870 to over one half of GNP in 1970. Their measure includes only specialized transaction resources that are bought or hired and excludes various transaction costs borne by individuals -for example, waiting in lines or investing in search in the factor or commodity markets. Table 1 summarizes the results.

Table 1. the transaction sector as a percentage of GNP

<i>Year</i>	<i>Private Sector</i>	<i>Public Sector</i>	<i>Total</i>
1870	22.49	3.60	26.09
1880	25.27	3.60	28.87
1890	29.12	3.60	32.72
1900	30.43	3.67	34.10
1910	31.51	3.66	35.17
1920	35.10	4.87	39.97
1930	38.19	8.17	46.36
1940	37.09	6.60	43.69
1950	40.30	10.95	51.25
1960	41.30	14.04	55.34
1970	40.80	13.90	54.70

Source: Wallis, J. and North, D. "Measuring the transaction sector in the United States economy, 1870-1970", p.121.

Eggertsson's comment on Wallis' and North's study was that they are not able to conclude from their study that the *total* output of transaction services has either grown or shrunk. Further, he argues, even if the level of transaction costs, measured as a share of GNP, were to increase, transaction costs per unit of commodities could fall with rising productivity of inputs.

Pejovich provides several reasons for the expansion of resources used in the transaction sector of a growing economy. First, he points out the expansion of markets and growing urbanization of the economy which replaces repeated dealing with contractual partners we know with an ever-lengthening chain of exchanges carried out between individuals who have no knowledge of each other. Thus, impersonal exchange requires more search and information-gathering activity as well as more elaborate enforcement mechanisms. Second, capital-intensive production techniques increase incentives for business enterprises to grow in size. An implication is that more resources have to be devoted to transaction services within the firm. Finally, he argues, that the gains from trade tend to create conflicting interpretations about the prevailing institutional arrangements as well as about the justice and fairness of the distribution of income in particular. Whether those conflicts emerge from differences in customs, ethnicity, religion, and race, or from occupational specialization and loss of personalized relationships between individuals in the community, more resources have to be devoted to defining and enforcing the rules of the game. North wrote:

‘The gains from trade can only be realized by the establishment of contracts between principals or principals and agents which form the institutional framework of a political/economic system. Therefore, without some form of political order, organized trade cannot develop... With simple political and economic organization, custom may be sufficient to specify the structure with a consensus ideology. As the gains from trade that arise from specialization and the division of labour result in more and more complex forms of political and economic organization, the resource costs of capturing those gains from trade will increase. They will increase not only because the costs of measurement and enforcement of an ever-lengthening chain that result from greater and greater specialization will grow, but also because ideological alienation will characterize the relations between participants in the exchange process and will require greater and greater amounts of resources devoted to specification and enforcement of contracts.’

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