

Outsourcing at the edge of chaos

Why transaction cost economics fails under complexity

MSc program in Information and Service Management

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Abstract

Transaction cost economics is one of the dominant paradigms in the study of outsourcing, namely in the study of what to outsource. However, many findings have questioned its power to explain or predict outsourcing. On the other hand, in recent years and decades the importance of complexity has been noted, and also that complexities tend to make it hard to use linear theories – such as transaction cost economics.

In this thesis, transaction cost economics is studied carefully in order to show why its ability to predict either the decision to or the success of outsourcing is weakened by the complexities in economies, organizations, etc. Since complexity is the reason of the failure, also some foundations for a theory that takes it into account are expected to be laid.

In order to approach the problem, each of the transaction cost economical constructs individually, as well as the theory in its entirety, are analyzed against economics, game theory, and complexity theory. The new theory is based on the findings from these analyses.

The failure of transaction cost economics is successfully identified and related to complexities regarding the problems caused by statistics, nonlinear functions, iterated games, and so on. New theory that does not suffer from the weaknesses of linearity is also outlined. However, such an approach is not recommended because of its complexity: the theory requires a vast array of knowledge to be used (as opposed to the simple theories that fail under complexity). Also, it is extremely case-specific, and it will be difficult to operationalize. Furthermore, like other theories, it has a touch of tautology in it.

Because of the problems related to transaction cost economics (as well as other views mentioned) are clear-cut, its use in outsourcing is not recommended. However, since the same applies to a more complex theory, the conclusions are rather surprising. In short, the author concludes that we should not focus too closely on what we intend to outsource, but rather on how do we handle the process of outsourcing. Its scientific study in academia is more likely to produce better generalizable results, and learning the principles is in all likelihood much more valuable to businesses (and as a result, to business students) than learning the “what theories”.

Keywords transaction cost economics, outsourcing, complexity, economics

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1 Introduction

Equilibrium is the state of death, only chaos produces life. The Ancient Greeks have been driven to extinction by too much search for architectural harmony.

Stéphane Lupasco (1951)

1.1 Background and motivation

Outsourcing keeps capturing the imagination of both academia and business, big and small alike. However, to paraphrase Robert Solow's (1987) famous quip, outsourcing can be seen everywhere but in the productivity statistics (e.g. Broedner et al. (2009), for a strong and negative impact). The reasons to outsource abound, ranging from the bluntly mundane (cost reductions) to the downright silly (to follow the fashion), but also to strategic reasons (Gonzalez et al., 2010).

In addition to increasing our understanding of the reasons to outsource, academic research has contributed by producing several different frameworks that prescribe what should be outsourced and how the process should be handled. This thesis is concerned with the former, although understanding complexity may also help with the latter. There are several theories that already prescribe the *what* side, including for instance the resource-based view and the theory of core competencies.

One of the most important theories, if not the most important one, is transaction cost economics (TCE). According to the transaction cost theory, the key to sourcing decisions is in transaction costs, and particularly in economizing thereon. The transaction costs are likened by Oliver E. Williamson (1985, p.19) to friction in physical systems. Friction is defined as the force that resists motion, and in physical systems its existence is obvious. Likewise, in economic systems costs of running the system must be taken into account, but Williamson (ibid.) points out that in neoclassical (or what one might call *regular*, as opposed to the new institutional economics school of which the TCE is a part of) economics the friction is not taken into account, and because of that non-standard contracts, such as franchising, were poorly

understood. This thesis is mainly focused on outsourcing, not other non-standard modes of organization, but there are mentions to those as well.

What follows logically from the idea of transaction cost theory is that transaction costs set natural boundaries of the firm: the decision to make or buy is actually a rather simple cost-minimizing decision. Simply put, production costs are assumed to be lower at the market, but when transaction costs are accounted for, the expected total cost may become higher. Thus, the natural boundaries are set where total costs are minimized. This is graphically presented in figure 2-2.

Because of these naturally set boundaries, TCE has often been used as a tool to evaluate outsourcing decisions. The usual line of study is to estimate whether outsourcing is explained by the assumption that asset specificity, frequency, and uncertainty are all inversely correlated with outsourcing.

For some background into the study, this thesis was meant to be yet another outsourcing-in-light-of-TCE study as I was handed a wonderful data set by the Real-Time Economy competence center at Aalto University. However, as I was doing some preliminary exploration of the data, the answers to the question *what are the main reasons for your decision to outsource or keep in-house accounting* were such that there was *nothing* in support of transaction cost economics. Thus, forcing the answers on the Likert scale through the TCE mincer felt gratuitous.

At the outset, I had accepted the claim that “(empirical) transaction cost economics is a success story that we should celebrate” (Williamson, 1996, p. 27) at face value; I was under the assumption that transaction cost economics was indeed found to be an accurate description of how organizations behave. But the initial findings led me to believe that there might be something else going on. Indeed, several meta-studies, discussed in more detail later in this thesis, show that Williamson’s above position is optimistic, to say the least. (Note: this relates to outsourcing, not other non-standard modes of contracting.)

Roughly at the same time as the transaction cost economics rose in popularity (generally starting in the 1980s and culminating in the canonization of TCE through the *Nobelization* of Prof. Williamson in 2009) the idea of complexity started to gain a foothold within the scientific community. Johnson (2009, p. 3) defines complexity science as “the study of the phenomena that emerge from a collection of interacting objects”. I don’t remember clearly at which point I stumbled upon complexity, but the study of complex (adaptive) systems and its application

into organizations and economies rang a bell. Perhaps opportunism should not be considered a problem?

Developing on that idea in this thesis, I will argue that transaction cost economics does not ask the right questions or give the right answers. That is, while there may be an optimal structure assuming a static and linear environment, the environment changes and so firms can and must account for complexity in order to survive.

On a final note, complexity in this study is first and foremost a mindset. This study is not a traditional complexity study which are often simulations of agents that are allowed to roam freely in order to fulfil a set of goals. Some understanding of complex behavior is a must in order to follow the logical chains of thought of an if-this-then-that (and if-that-then-this-and-this-leading-to-such-and-such) manner, but no more than that.

1.2 Aims of the study

There are two research questions in this study:

1. Why transaction cost economics fails when determining sourcing when the complexity of organizations and economies is taken into account?
2. What kind of a theory or framework could better handle the complexities where TCE fails?

The first question is fairly straightforward. First, it will be shown that transaction cost economics is not very successful empirically. Second, the theory will be analyzed and inconsistencies between the linear theory and the complex real world are explored.

The second question is much more difficult. TCE is quite a coherent theory, and in all likelihood the theory laid here will be far less *precise*. However, it is aimed to being much more *accurate* (see figure 1-1). That is, TCE aptly gives answers, but at times they may be precisely wrong. I aim to present a theory that is not necessarily precise, i.e. it may be more difficult for the user, but perhaps it is more accurate, that is, without a systematic error. In any case, the aim is to lay some foundations for a theory that takes complexity explicitly into account.

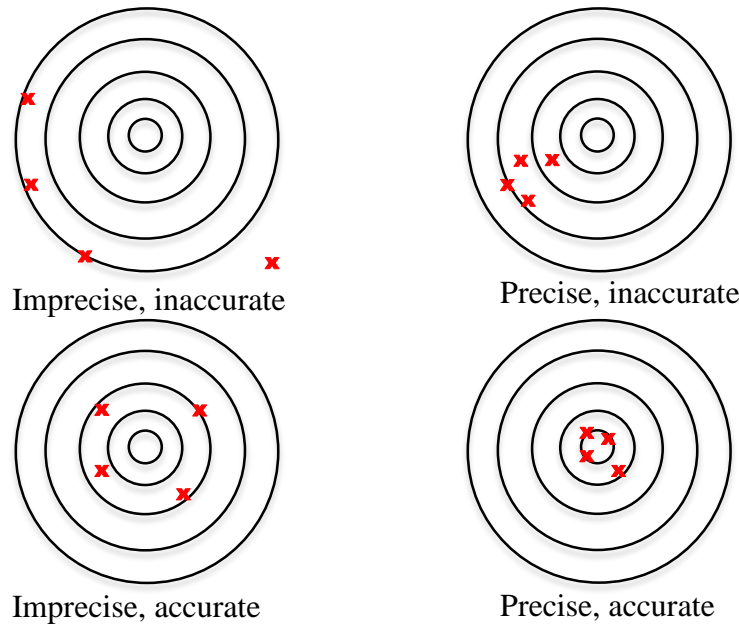


Figure 1-1: Precision and accuracy

Note how the most accurate x of both precise, inaccurate and imprecise, accurate are at the same place, at about eight o'clock in the middle circle. This means the two estimations give the same answers – but only one of the two has a systematic error. In other words, one of them is *on average* exactly right, but with a measurement error which can be accounted for by building in some redundancy.

1.3 Methodology

The nature of this thesis is mainly theoretical, but some literature will be reviewed in order to back up some claims regarding transaction cost economics and to show some further developments from the studies regarding complex systems.

The theory of transaction cost economics will be drawn chiefly from the works of Oliver E. Williamson, but some other sources will be referred to also. The theory regarding complexity needs to be somewhat thoroughly explained since it is not standard material among business students, but references will likely be few and far between since they are standard theory.

Regarding theoretical work, the intention is to draw from a variety of economic theories – this is not a competition between TCE and other theories (like some other studies), but rather an attempt to find where TCE fails and an attempt to create theory that would take that into account.

1.4 Structure of the thesis

The thesis is divided into two major parts, each consisting of two chapters, excluding the introductory and the concluding chapters.

The first part gives an introduction to the topic. In chapter 2, the theoretical background is established. First, the theory of transaction cost economics is explained. Second, relevant theory regarding complexity is explored and explained carefully to establish both an understanding and a common language. Finally, some of the other theories related to outsourcing will be looked at for future referencing.

Chapter three will review the empirical findings related to TCE in sufficient detail in order to back up some of the claims made in the thesis. Furthermore, some findings from the studies of complex systems will be presented as they are used to challenge the TCE paradigm.

In the second part, chapter four discusses the failure of transaction cost economics by weaving together its theory, some illustrative examples, and the features of complexity. The fifth chapter of the thesis proceeds to offer some lessons that we can learn from the studies of complex systems.

Finally, the thesis will naturally have some concluding remarks and recommendations for future research.

1.5 Some definitions

It is probably useful to define two core concepts before moving forward. The first of these is outsourcing (or sourcing in general) which refers to obtaining a certain product (service, process, widget) from any organization upon which the contractor has no authority other than that stated by the contract. The second is complexity which is very difficult to define, but generally that refers to all sorts of systems that cannot be depicted in a linear fashion.

1.5.1 Outsourcing and insourcing

Generally, this thesis juxtaposes *result* and *process*. The former of these is a non-divisible item or service that is achieved through the latter. The process then again refers to any kind of work (manual, mental, machine) that must be done in order to achieve a result.

The non-divisibility refers to the fact that the results cannot be divided a posteriori; for instance, invoicing can be divided by type (sales, purchase) or by activity (receiving, sending, processing), but when the firm has outsourced, say, sales invoicing, it is buying the non-

divisible service of sales invoicing, not the services of sales invoice preparing, sending, registering, archiving etc. This is not to say that the invoice could not be pulled from the archive, corrected, re-entered, etc., but that the process cannot be reversed so that the work put into the process could somehow be salvaged.

Thus, outsourcing in terms of this thesis is defined as obtaining a certain result from an external provider. The result is the non-divisible bundle that is generated in the process.

On the opposite side there is insourcing or integration. This means the generation of the said result is achieved through an internal process that can be infinitely divided and re-defined.

The general implications of the two are that when any asset, process, etc. is outsourced, it becomes a fixed job that the contractor is looking to get done. That is, the contractor is paying someone to do a job it wishes to get done. On the other hand, when the asset is integrated, the firm is looking to enable itself to achieve a result.

For instance, a warehouse can be either outsourced or integrated. When the warehouse is integrated, the firm gets a warehouse with which it can do what it pleases; it can use it for warehousing, or it can transform it to an indoor sports center (barring any regulatory restrictions), or it can be sold or leased, etc. When the warehouse is outsourced, it depends on the contract, but generally it is stated for which use it will be fitted, what will it cost, and how long the contract will run for, and in many cases there are also other options (e.g. lease expansion, extension, or early termination).

One of the key points in this thesis will rely on the above idea: outsourcing and integration are not exactly comparable, or rather, they are best used to achieve different things (contrary to TCE logic where the asset is seen as fixed).

1.5.2 Complexity

Complexity is in essence the idea that there are systems that have different parts which interact with other parts in many different ways. These systems can consist of other systems, so a number of systems can form another system, and it is not hard to see how this quickly results in a somewhat messy lump where it is quite difficult to exactly pinpoint causes and effects.

Because of that, complex systems (such as economies and all human networks, including all kinds of organizations) have a tendency of behaving in manners that go beyond the explanatory powers of linear theories. That is, complex systems may seem chaotic in that

there seems to be no reason why they function like they do. Indeed, these emergent capabilities mean that the systems cannot be understood just by looking at the parts of those systems.

Generally, though, complexity cannot be explained thoroughly by any clear definitions. This is why usually complex systems are approached by explaining their features, that is, what kinds of interactions there are within those systems. This approach is also taken in this thesis, and the features of complex systems, as far as they are relevant in terms of this thesis, are explained in chapter 2.5.1.

The relevance of complexity is that transaction cost economics, as well as other linear theories, tend to fall apart in the real world. The general reason is that everything affects everything else, and back again in loops. This is because of two different issues. First, they are rarely capable of taking into account second- and further-order effects. The second is endogeneity which stems from two sources: from either a confounding factor, or from a causality loop.

The first-order effects are obvious to the eye, for instance in transaction cost economics opportunism can increase the revenue of the opportunist at the cost of the victim. However, the second-order effect could be that the victim tells all his friends that the opportunist is an untrustworthy opportunist, and this then leads to the opportunist going out of business pretty quickly (see chapter 4.4.1).

Having a confounding factor means that you come up with a variable or a set of variables which are not the ones that affect the dependent variable, but something that has something in common with the thing that you want to measure. For instance, asset specificity might have nothing to do with outsourcing, but some assets that are generally not outsourced are also described as specific, and vice versa.

A causality loop then again refers to the fact that there are not just inputs and outputs, but that each affects the other (and different inputs affect other inputs), so saying something is more valuable in the current transaction than anywhere else is missing an important disclaimer: *ceteris paribus*. But we know that *ceteris* does not remain *paribus*.

2 Theory

In this chapter, the theory regarding transaction cost economics and complexity are explained. Because the theory is in such a central role in this thesis, the chapter is lengthy, and the non-technical reader is advised to read subchapter 2.3 and to see the table at the end of chapter 2.5 (p. 25) as these aim to explain the theories in a nutshell, using as few technical terms as possible.

2.1 Transaction cost economics

The price mechanism, a (or even *the*) central idea of free markets, means that supply and demand direct prices of goods and services, as though led by an invisible hand, to borrow a famous analogy (wrongly).

Transaction cost theory, as set by Ronald H. Coase (1937, p. 390), states 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.” This is the central idea of transaction cost economics, although there are some differences between the Coasian and the Williamsonian views of the transaction cost economies.

Oliver E. Williamson (1991, p. 76) claims that this economizing on transaction costs is the top priority for any company: “Economy is the best strategy.” According to him, “that is the central and unchanging message of the TCE perspective”. While Williamson (*ibid.*) does not completely trash the usefulness of strategy, he asserts that economizing is what counts, that most often strategizing is to be used to promote economic behavior, and that students should rather learn how to economize than how to strategize.

Transaction cost economics then attempts to explain why firms exist and what are their boundaries: the existence is explained by those costs (firms exist in order to carry out their aims economically in terms of these transaction costs), and the boundaries of the firm are decided by what is efficient to do in-house and what is more efficiently done by the market. Next, these transaction costs are explained.

2.1.1 Transaction costs

There are two types of definitions for transaction costs. Dahlman (1979) divides the costs into three categories: discovery (sometimes labelled search and information), negotiation and conclusion (bargaining and decision), and other costs which later developed into contract

policing costs. These latter types of costs were originally in essence the costs of re-negotiation; either re-contracting short contracts or changing longer-term contracts.

Oliver E. Williamson (1985 p. 20-21) provides a more structured format of the latter two types of costs. The costs are divided into two categories, *ex-ante* and *ex-post* costs. *Ex-ante* costs, or those incurred before the entering an agreement, include drafting, negotiating, and safeguarding an agreement. Drafting and negotiating are self-explanatory, but safeguarding likely needs some articulation: safeguards are *a priori* mechanisms that aim to the fulfilment of the contract in a way that benefits both sides. For example, common ownership (of a specific asset) means that neither side will be able to hold the asset hostage in order to opportunistically negotiate a better deal.

The *ex-post* costs, incurred when the contract is in force, include maladaptation, haggling, governance, and bonding costs. Maladaptation costs are simply the costs of re-defining the contract while it is still in force, but no longer meaningful for either or both of the parties; Williamson (1985, p. 21) argues that maladaptation provides a situation in which strongly opportunistic behavior might arise.

Haggling costs are similar, but involve filling the blanks in an incomplete contract rather than changing the contents of a complete one. Governance costs consist of creating and maintaining a system to see that the contract is fulfilled. Finally, bonding costs refer to the boundaries of the provider, enabling secure, but not always effective fulfilment of the contract, i.e. the provider or its employee is not empowered to device a quick ad hoc action plan to effectively address an issue, but instead will have to stick to what is stipulated by the contract.

Table 2-1: Transaction costs

Ex-ante costs	Ex-post costs
Drafting	Maladaptation
Negotiating	Haggling
Safeguarding	Governance
	Bonding

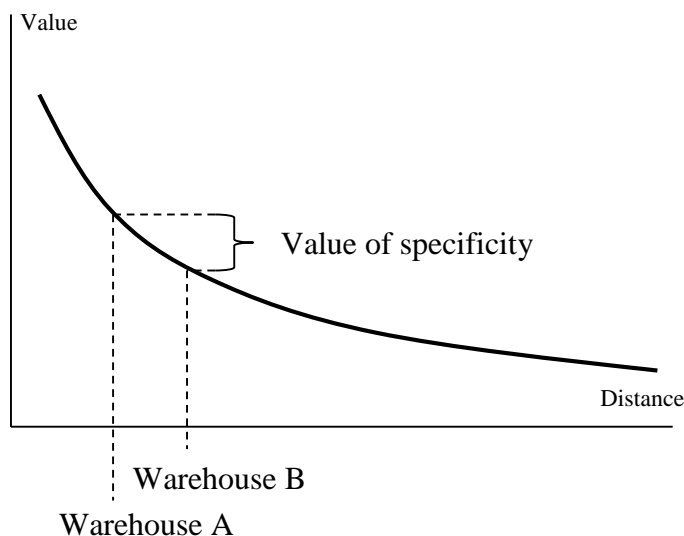
I believe both Dahlman and Williamson's definitions are worth mentioning. While Williamson's definitions are better formalized, I have not quite understood why Williamson's definition is missing search costs since the search costs can obviously differ greatly between the two modes of acquisition.

2.1.2 Asset specificity

Specific assets, in general, mean assets that have less value everywhere else than in their current (or proposed) use. On the opposite side, there are general or non-specific assets which are equally valuable everywhere. It should be stressed that asset specificity is the most important concept in the transaction cost paradigm (Williamson, 1981, p.555; 1985, p. 52).

Williamson (1983, p. 55) recognizes four types of specific assets: site-specific, physically specific, and human-specific assets as well as dedicated assets.

The meanings of the four are as follows: a site-specific asset is for example a warehouse situated near a factory (see illustration below). *Ceteris paribus*, the warehouse closer will be more valuable to the contractor and so the provider of the said warehouse can opportunistically ask for more than the *fair* price. This naturally implies that the firm would be better off acquiring the said warehouse.



Asset specificity. In this case, TCE would order us to acquire warehouse A if the costs of internal organization are less than the difference between the loss of value when moving into the warehouse B. This idea is not disputed in the thesis, but it will be shown that such reasoning is counterproductive.

Figure 2-1: Asset specificity.

In the above case, it can be reasoned that warehouse A is preferred, obviously, by the contractor, and that it needs to protect its interests by acquiring rather than leasing the site (assuming that total cost of integration do not exceed the value difference) because the lessor might opportunistically charge higher prices.

A physically specific asset is one that is used for a specific purpose. The way it is understood and thus used in this thesis is that it does not have to be physical as such; just

something that is idiosyncratic. For example, a highly modified computer system makes the contractor dependent on the subcontractor, thus enabling opportunistic behavior from the latter.

Human-specific assets are largely the same as *firm-specific human capital* in personnel economics, i.e. it is only valuable to the current firm. An often-used attribute of these assets is that of *learning by doing*. Although that is usually the way in which these assets are acquired, learning by doing is both unnecessary and insufficient as a descriptor. For instance, one may have a special set of skills which is more valuable to the current employer than for any other although the skills may have been acquired somewhere else – often this may be the case when employed by the government, i.e. the employer market for that particular set of skills is very thin.

Finally, dedicated assets are such that might not be specific to a transaction per se, but have been acquired in order to fulfil a (prospective) contract. To continue with the warehouse example and assuming away the site specificity, i.e. the subcontractor may have acquired a warehouse which is of the general type of warehouses and in a generally preferred area. However, if it loses the contract it will have no use for the warehouse, resulting in large overcapacities. Knowing this, the contractor can negotiate the price down opportunistically since it knows the supplier will either have to give discount or lose the investment.

2.1.3 Uncertainty

Uncertainty, in terms of transaction cost economics, is divided into behavioral and environmental uncertainties (Williamson, 1985, pp. 56-60). There are several different nominations for these two, but the terms are chosen for their simplicity. The former refers to controlling opportunism, while the latter refers to the expected variation.

The difficulty of controlling opportunistic behavior means mostly that the contractor cannot confirm the behavior of the seller. In other words, it refers to the difficulty of measuring the labor done by the supplier. For instance, if a firm outsources recruitment, it cannot know for a certainty whether the supplier actually works toward the end of finding the best employees, or if it does the least possible work to produce somewhat adequate candidates.

According to Williamson (1985, p. 60), low predictability should lead to higher transaction costs since the contracts need to be altered accordingly. In a time of high demand, the opportunity cost of (spot) contracting is even higher since the entrepreneur/manager should have even more than usual at hand. Since an internal employee (or perhaps another asset) can

respond to these change more quickly, a higher level of environmental uncertainty should lead to lower levels of outsourcing.

2.1.4 Frequency

Frequency, according to Williamson (1985, p. 60) refers solely to the buyer's activity in the market, and higher frequency should lead to a lower level of outsourcing. As Williamson, we will assume away one-off dealings for a simple reason: they are not very common in this context. There are thus just two types of frequencies: occasional and recurrent. Occasional investments (this does not refer to just investment-type acquisitions; just something a firm puts its money into) are such where there is very rarely need for internal organization, but it increases as recurrence emerges.

The reason why outsourcing should decrease as frequency increases actually derives of increasing asset specificity. The logic is as follows: to achieve economies of scale, worker specialization must increase, and so do the idiosyncrasies as the organization's systemic complexity grows due to different interrelationships between workers and tasks. (Williamson, 1985, pp. 60-61).

2.2 TCE – Assumptions and contracting process

Transaction cost economics relies upon the dual behavioral assumptions of bounded rationality and opportunism. The following subchapters will provide an explication of each as well as show their implications to the contracting process.

2.2.1 Bounded rationality

What must be Williamson's favorite quote should be used here: bounded rationality means that humans are "intendedly rational, but only limitedly so" (Simon, 1957). In terms of the transaction cost theory this means that in some cases contracting becomes impossible since every possible event cannot be fathomed out even if both of the parties would desire it. Since contracts are drafted by humans, bounded rationality must always be assumed by definition. However, this is not necessarily a problem – incomplete contracting is not an issue when there is no risk for opportunistic behavior.

2.2.2 Opportunism

Opportunism, as Williamson (1985, p. 30) puts it, is "a condition of self-interest seeking with guile". The guilefulness is what differentiates opportunism with regular self-interest of the

Smithian tradition. That is, in the traditional sense a great amount of perfect knowledge is expected, but in opportunistic behavior some information is not fairly disclosed, thus perverting the trade. For transactions, the condition of opportunism means that the parties of each transaction must protect themselves from opportunistic behavior: they do not need to assume opportunism, but not acknowledging the risk thereof would be naïve.

Protection against opportunism can naturally be achieved through contracts. A carefully planned contract, that is, one that stipulates contingencies for all possible events, can give protection against opportunism.

It should also be stressed that opportunism is, alongside asset specificity, the most important concept of TCE: Williamson (1993) states that opportunism is a requirement for non-market contracting and governance.

2.2.3 Contracting process

The transaction cost paradigm revolves around the contract. Indeed, Williamson (1985, p. 41) posits that: “Any problem that can be posed directly or indirectly as a contracting problem is usefully investigated in transaction cost economizing terms.” Williamson (1985, p. 31) shows the proper contracting processes under each set of behavioral assumptions in the form depicted below.

Table 2-2: Assumptions and contracting process. Adapted from Williamson (1985, p. 31).

Behavioural assumption			Implied contracting process
Bounded rationality	Opportunism	Asset specificity	
0	+	+	Planning
+	0	+	Promise
+	+	0	Competition
+	+	+	Governance

The reader is reminded that one must always assume both bounded rationality and opportunism. This leads to a simple conclusion: the first two processes, planning and promise, do not work. Planning will not work due to the nature of humans: we are quite simply incapable of taking every possible event into account. Then again, sketching an incomplete contract in the manner of “you do the best you can and we pay you fairly”, i.e. both parties promising to

do their part, will not work since there is always the risk that over time one of the parties decides not to live up to their promise.

Following this thought there is a simple heuristic to follow: if an asset is not specific, subject whatever is being contracted to competition. If asset specificity is to be assumed, look for governance.

Competition can be achieved under the classical, or discrete, contracting. Under competition, or market governance, there is no specific preference of partners: either party can do business with the other or decline irrespective of whether they have done business in the past or not.

Governance is somewhat trickier and can be achieved by using three different contracting schemata: trilateral, bilateral, or unified governance. The trilateral governance is an amplified form of market governance, one where the latter is supported by a pre-nominated arbitrator, and it is best suited for occasional transactions. The trilateral governance ought to be used in cases where there is some asset specificity, but due to the occasional nature of transactions, a bilateral or unified models would prove too costly.

Bilateral contracts then again are binding for both parties, irrespective of whether the other party holds their end (unless of course some action on behalf of one party is a precondition to another by the other). In terms of TCE, bilateral contracts are useful in mixed-specific and recurrent cases. This would be the case where some continuity is generally preferable, but the transaction costs are not extremely high.

Finally, unified governance is the type used under an integrated process, that is, where the decision is made to make and not buy something due to high risks of opportunism because of asset specificity. This type of contracting, since markets are always preferred to integration, is mostly useful within the domain of idiosyncratic or highly specific services or goods, and especially in the case of recurrent ones, but also in some occasional acquisitions. An example of the latter type would be the manufacturing of some highly technical piece of equipment for which the drafting of the contract and even searching for able subcontractors would force high transaction costs.

2.3 Outsourcing from the perspective of the TCE

This subchapter is something of a summary from the previous two subchapters, and the reason to include this is to enable the non-specialized reader to capture the idea of transaction cost

economics in its entirety (or rather, in terms of outsourcing) as the previous chapters deal with the TCE-related concepts one by one. A further point of the chapter is to outline the economics which this thesis intends to challenge.

A repetition first. Assume there is a new service or a good, a pre-existing one that has changed (or is about to), or transaction costs have changed; in any case, there is some service or good that a firm must acquire. (It is assumed that prior to the change the firm was optimized in terms of TCE.) According to the theory, everything is by default acquired from the market and stronger modes of governance are only necessary when transaction costs occur. These costs were listed in 2.1.1, but what they are is somewhat irrelevant because they are unmeasurable at the time.

These costs, however, would not be an issue without the dual assumptions of the TCE. These assumptions are those of bounded rationality and opportunism. The former means that those costs cannot be contracted away by making fool-proof contracts, and the latter means that people tend to (or at least might) seek self-interest guilefully and thus one would need those fool-proof contracts. So, the solution is either integration (or insourcing) or a contract that holds stronger than a regular market contract, but nevertheless maintains the separation of the supplier and the buyer as legal entities. However, to keep things simple, these non-standard contracts are assumed away, and sourcing is a binary make-or-buy decision.

Since bounded rationality and opportunism are always assumed to be present, the solution with which the proper mode of governance is selected can be estimated through proxies which are uncertainty (the difficulty to estimate the exact demand and the difficulty to evaluate the subcontractor's performance), frequency (how much/often does the contractor require these goods or services), and most importantly, asset specificity.

An asset can be specific in a number of ways (listed in 2.1.2), but the important thing – what makes an asset specific – is that an asset is specific in the case where the asset has more value in the current or proposed transaction than if that asset would be put to any other use.

The below figure depicts the relationship between production costs, governance costs, and asset specificity. As an asset becomes increasingly specific, the production cost between internal and external production decreases since the production becomes more idiosyncratic, but ΔC is only ever assumed to converge toward zero, meaning external production is never assumed to be more expensive in terms of production costs. Then again, as the asset specificity increases, ΔG or the difference of governance costs between outsourcing and integrated

organization does become negative. Since the former converges to zero and the latter becomes negative, the total cost of integration also becomes negative, i.e. integration becomes more economical than outsourcing. This is basically the bottom line of outsourcing in light of TCE.

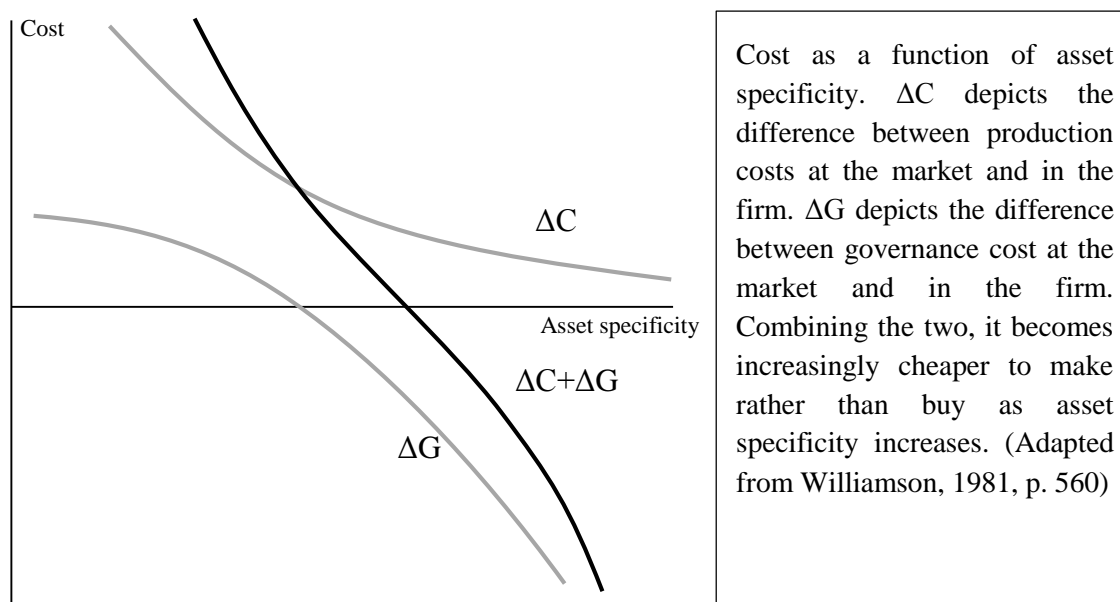


Figure 2-2: Costs as functions of asset specificity

Asset specificity aside, the theory goes that uncertainty and frequency should also be inversely correlated with outsourcing. Uncertainty is divided into two: behavioral and environmental uncertainties which require interaction with asset specificity. That is, it does not matter if measuring output is difficult or if the expected volatility is high since it is easy to go to the market and buy from another party.

In terms of frequency, it was already explained that increasing frequency causes increasing asset specificity. Thus, because both uncertainty depends on asset specificity and frequency causes it, the above position that asset specificity is the bottom line is well justified.

2.4 Other theories used in this thesis

This chapter will take a look at two competence-based views of organization as well as two theories regarding contracts and the interplay between firms. The reason why these theories are presented is that they are referred to several times in this thesis and they offer views alternative to TCE.

The resource-based view and the core competencies theory are the competence-based theories (and will be referred that way later), and they are also mostly concerned with what types of resources should be outsourced. Unsurprisingly, both theories have also been coupled with TCE to create combinatory views which just goes on to show that one rather simple theory cannot answer all the questions in a complex world, no matter how good it would be. These two theories are jointly referred to as competence-based theories.

The two other theories are agency theory and game theory. The former discusses the asymmetry between the agent and the principal, and is paramount to understanding especially the implicit effects of contracting. Game theory is hugely important in this thesis: if Williamson claims that before his theory, nonstandard contracting was poorly understood, it is likewise with game theory before which there was poor understanding of how firms' actions affect the actions of other firms. It is in fact quite incredible that the whole body of Williamson's work barely notices the existence of game theory.

2.4.1 The resource-based view

The resource-based view (RBV) of the firm, originating around the same time as the TCE, states that a firm can achieve competitive advantage through its resources. What gives the resources potential for sustained competitive advantage is that these resources are "valuable, rare, inimitable, and non-substitutable" (Barney, 1991) or VRIN, as the commonly used acronym goes. Also, Crook et al. (2008) found that RBV is strongly supported by the data.

The difference between TCE and RBV, according to Conner (1991), is that the TCE has the sole purpose of avoiding negative impacts while the RBV sees the firm as a collection of resources. Thus, Conner and Prahalad (1996) argue that even though there would be no threat of opportunism, some activities should be organized internally. The latter point is proven to be correct by Bylund (2015).

McIvor (2009) argues on ground of several studies – and develops a framework – that in essence furthers the idea that the RBV and the TCE are in fact complementary, that is, understanding of both theories is necessary, and not one of them completely explains outsourcing.

2.4.2 The theory of core competencies

The core competencies theory by Prahalad and Hamel (1990) suggests that focusing on these core competencies is the key, and that the rest are potential candidates for outsourcing. The

core competencies are such that fulfil three criteria: they have multiple potential uses, are seen important by customers buying the end products, and they are difficult to imitate.

Clearly, core competencies are *specific assets*, but they are equally clearly different things. Indeed, core competencies are more complex than specific assets. Core competencies are something that provide for fitness, and since they are good for multiple uses, they in fact enable the company to look for other fitness peaks instead of fighting tooth and nail for the current one which is the destiny under TCE.

Arnold (2000) has developed a model which integrates the two theories. However, the model does not really seem to take core competencies as a whole, but rather views the model as a something of a linear function for asset specificity – something I obviously disagree with. Basically the idea is to inject the short-term TCE with the long-term nature of core competencies, but they are not quite so compatible. Still, the idea is clear and points to the fact that a single theory is unable to answer everything.

2.4.3 Agency theory

The core of agency theory, as stated before, is at the contract, meaning the theory does not explicitly state which processes should be outsourced, but is more interested in the (a)symmetry of interests. In essence, agency theory discusses the issues that arise due to different incentives for the principal (contractor) and agent (supplier).

The agency theory shares many features with transaction cost economics, as pointed out by Eisenhardt (1989), but they have distinctive features also. For me, agency theory provides valuable insights because I do not believe firm boundaries have much to do with either opportunism or bounded rationality. TCE is interested in firm boundaries, agency theory only in (the payoff of) the contract. This is an important division since TCE does not fully take into account that payoffs can remain similar whether or not the (human) asset is integrated.

2.4.4 Game theory

Game theory studies strategic decision making, and it has some similarity with agency theory in that both study situations where there are two parties who try to choose what is best for them. The difference between the two is that agency theory is interested in the agent-principal problem which means in essence the asymmetry of interests (and ways to overcome it), whereas game theory is interested in finding out which course of action is best for each side. Thus, agency theory is related to the transaction, and game theory is related to opportunism.

Williamson (2007, p. 5) posits that there are similarities with game theory and TCE, but that "TCE nevertheless differs in that contractual incompleteness sets in as the limits on rationality become binding in relation to transactional complexity" and that "TCE views governance as a means by which to relieve the oppressive logic of 'bad games'." Neither of these views are agreed with in this thesis. While contractual incompleteness sets in, it is of strategic benefit for both parties to co-operate which is obvious when games are played iteratively (see chapter 4.4.1 for more details). In turn, bad games (like prisoner's dilemma) can also be averted by co-operation.

For instance, in prisoner's dilemma the best strategy for each side is to be opportunistic, meaning neither has anything to gain by co-operating. But in such situations the game can be rigged by introducing rewards and penalties for certain behavior, regardless of boundaries. In fact, as we will see in chapter 4.4.1, the rewards and penalties underlie any transaction even if they are not stated explicitly.

2.5 Complexity

While the study of complex systems stems from mathematics and natural sciences, it today is a cross-disciplinary field gaining momentum in social sciences as well; indeed, complexity is rather a framework or a paradigm according to which science is made than it is a discipline as such, although "complexics" has been suggested as a discipline (Bastardas i Boada, 2015) (perhaps as a stunt to raise awareness to complexity).

As such, complexity both challenges and does not challenge the reductionist science (reductionism and linearity are equal here). Reductionist science has successfully helped us identify the components that are interwoven into complex systems, and the study of complex systems does not deny that, for instance, substances consist of atoms. However, reductionist science runs into problems when it tries to describe complex behavior using linear models, and here the language and techniques of complexity studies might be able to help. In other words, each of them has a role to play, but often times we have been stuck with using reductionist methods with complex systems, not vice versa.

This may partly explain why completely different takes on outsourcing, such as RBV and TCE, are both somewhat useful guides (and why a combination is better than either alone). The problem is, as Bastardas i Boada (2015) points out, not that we need better simplistic, linear models, but that we should be able to create theory based on complexity.

Complexity is notoriously difficult to define. Johnson (2009, p. 3) defines complexity science to be “the study of the phenomena that emerge from a collection of interacting objects”. While this is a good definition, it does not exactly help us understand complex systems. Instead, a usual (and better) approach is to describe those phenomena, or in other words the features that complex systems generally possess. The aim of this subchapter is to list those features.

2.5.1 Features of complex systems

The first necessary feature of any complex system is that it has **a large number of parts**. Large is obviously a relative measure, but it needs to be large enough that establishing clear links becomes difficult. Three is the absolute minimum, but in general the amounts tend to pile up because the systems are open. For instance, medical issues are difficult because it may be difficult to understand whether the reason is that A causes B or A causes C and D which in turn cause B. Point being, if A cannot be controlled, it could still be possible to control B by controlling C and D. Recent interest in epigenetics could be named as an exciting example.

Complexity **emerges** from those parts, meaning simple parts can form a complex whole (although the parts can be complex too, and in general it depends on the level of interest whether the parts are complex or not). Emergent behavior is the phenomenon where the behavior of the system is not understood from the behavior of its constituents. It is worth noting that this does not mean that the parts would not determine the whole; to paraphrase Lorenz (2005), the parts determine the whole, but the approximate parts do not approximately determine the whole.

An example of this could be such that an organization outsourced one of its processes, faced opportunistic behavior, and then re-engineered the process entirely, thus integrating the specific part and outsourcing the non-specific part. With the benefit of the hindsight, it is obvious that re-engineering was caused by opportunism and opportunism was enabled by the outsourcing as well as caused by the agent, but there is nothing particularly *re-engineeringly* about anyone of the parties.

Interaction or **interdependence** of different parts is another one of the most important features of all complex system studies. Interdependence means just that the parts are interconnected and so if something happens to one of those parts it elicits a response from the other parts as well. For instance, there has been much controversy during the euro crisis whether to pump more debt into already indebted economies or take a more austere approach and heavily cut back on spending. Some people claim that the former will only push them over

the edge into default, others say that the latter will paralyze the economy. Both are, at least to some extent, correct.

Interaction obviously relates to **feedback** and feedback loops. Feedback means that there are mechanisms which feed information back into the system, and feedback comes in two flavors, positive (amplifying) and negative (dampening). Their names can be somewhat deceitful, since often positive loops are negative, and vice versa. For instance, bubbles and consequent crashes in the stock markets are caused by positive loops and the price mechanism is a negative loop. Sometimes the feedback systems have numerous parts, which lead to an obvious conclusion made by Åström and Murray (2008, p. 1): “This makes reasoning based on cause and effect tricky, and it is necessary to analyze the system as a whole.”

Feedback systems (that is, all complex systems) can also be open and closed. The latter are such where the feedback signals stay within the system. For instance, a car’s cruise control is a closed system; non-technically, it takes the speed from the speedometer and when the car slows down, it accelerates until the speedo hits the target, and vice versa for speeding up and braking. The system is not interested about external disturbances, although they affect the speed. An open system, then again, has boundaries like a closed one (although showing them clearly is difficult, perhaps even impossible), but it both affects and is affected by its surroundings. Businesses are obviously open systems: they both affect and are effected by the economic forces, employees come and go, and so on.

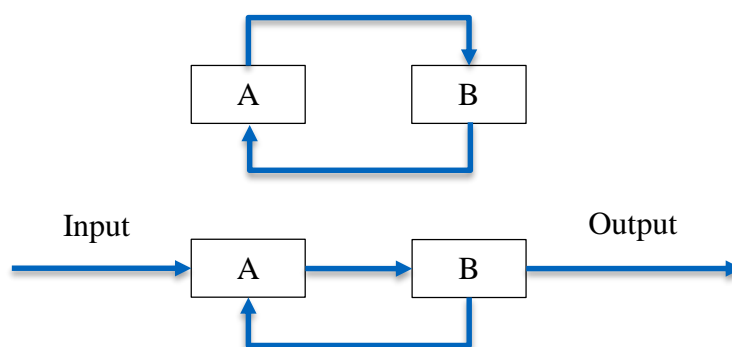


Figure 2-3: Closed (above) and open feedback systems

Nonlinearity is another important feature of complex systems. Emergence, interdependence, and feedbacks are obviously to blame for it. In essence, it just means that the system violates the *superposition principle*:

$$f(\alpha x + \beta y) = \alpha f(x) + \beta f(y). \quad (1)$$

What the superposition principle means in normal people language is that the function (or system) is equal to the sum of its parts, thus making it linear. The violation thereof, naturally, means that the function is not equal to the sum of its parts which in turn means that a change here might not result to an expected change there. Obviously, this makes estimation difficult and often nonlinear systems are linearized, as is the case with TCE and organizations where the TCE is a linear approximation of nonlinear organizations. Needless to say, this leads to some wrong conclusions.

Sensitive dependence to initial conditions, or more commonly known as the butterfly effect, is an example where the linear approximations fail. The term means just that small changes can have large impacts in the future. Thus, the system is sensitive to the initial conditions.

The classic example of this is the weather. The often-told story goes that the father of the effect Edward Lorenz was doing weather forecasts, and since it was the 1960s, the computer could not save any data. So, Lorenz had to re-input the numbers from a printout, and instead of the precise number in six decimals, he saved some time by typing only the three first. One would think that such a shortcut could not possibly have a large effect, but that is how the simulation turned out. As Lorenz (1963, p. 431) himself put it: “One meteorologist remarked that if the theory were correct, one flap of a sea gull's wings would be enough to alter the course of the weather forever. The controversy has not yet been settled, but the most recent evidence seems to favor the sea gulls.”

In terms of business this could mean the following: consider there are two competitors for a market, called A and B. A is TCE-optimized and thus its production cost is \$1.2, while B naively trusts its suppliers and makes the same product for \$1.1. Both want 25% margins, so final prices are \$1.6 and \$1.47. Now, the demand is price elastic, so B sells 1000 pieces and A sells just 100. Thus, B makes \$370 and A makes \$40. However, the investment required to start production is \$100, so A will not enter the market or it will make a big loss. Now B invests those \$370 into R&D and comes up with a great product that it can make for \$1.3 and sell for \$3, and so on. And all of this is because of a dime.

Complex systems are said to be **far from equilibrium**. When systems are isolated (which they never are, but often that is a useful assumption) they tend toward equilibrium which is the state of non-changing of variables. Far from equilibrium then obviously means that the variables are changing. When a system is far from equilibrium, it can be forced toward equilibrium, but that takes energy and energy comes at a cost. In terms of business, this energy is of course labor and the cost is money. Thus, an organization must be able to come up with that money if it intends to remain in equilibrium. Also, it is quite likely that these costs will increase exponentially. The other option is of course allowing change and uncertainty. This thesis views that TCE is something with which to force equilibrium, and that too much search for harmony will kill the organization. Instead, organizations should embrace uncertainty and adapt as necessary.

Complex systems sometimes also possess the ability to **self-organize** which means that organizations, groups, etc. are formed without an intelligent designer or a leader. Indeed, even one of the lowliest animals of this planet, the army ant, is capable of putting on one of the most awesome shows known: in the hundreds of thousands, these blind and unknowing insects create massive legions that kill everything in their way, and form magnificently strong fortresses to protect their queen and larvae (Mitchell, 2011, p. 3). Unsurprisingly, the army ants (like other flocking and swarming animals) have been fascinating the students of complex system for a long time. This is also relevant for organizations consisting of somewhat more intelligent creatures, such as businesspeople, and will be discussed in the next chapter.

There are just two features left to be presented that were deemed important in order to understand complexity in organizations. However, the two are extremely important – perhaps the most important ones.

The first of these is **adaptation**. It is very, very important for living systems, and often the studies of these systems are found under a separate title, complex adaptive systems (CAS). I did not wish to make this separation although organizations are clearly CAS. Adaptation simply means that these complex systems are able to change individual and collective behavior in order to respond to changes in their environments. The thesis views that TCE does not recognize this behavior: the point is not to be economical about a task, but to be able to change the task if need be.

Finally, the bottom-line question: how do species survive and businesses thrive? It is the survival of the fittest, and the idea of fitness can be depicted by **fitness landscapes**. Fitness

is obviously a more-less question, and a fitness landscape is reminiscent of a landscape with peaks and valleys, the former depicting better fitness and the latter poorer fitness.

The reason to mention fitness landscapes is that they help us understand the idea that doing business is not simplistic. Obviously, the fitness landscape cannot be depicted in this case (it is an n-dimensional landscape, and even if it was reduced to three dimensions, the exact locations of peaks would be impossible to tell).

However, we are able to speak of the nature of the landscape. How high and wide are the peaks, i.e. is the difference between one strategy and another huge in terms of fitness, and how exactly do you have to hit that peak? How rugged or flat is the terrain, i.e. are there many peaks? Is the landscape quite static or extremely dynamic (in business, the landscape is never static per se, but it can be expected to be static for a certain amount of time), i.e. is efficiency or agility more important?

To summarize, the features are listed in the below table. The explanations have been kept as simple and as short as possible in order to help the non-technical reader capture the idea of complex systems.

Table 2-3: Features of complex systems

Feature	Explanation
Many parts	All complex systems have many parts. They are needed in order for there to be any interactions.
Emergence	Complexity emerges from those parts. That means that the way in which the system behaves cannot be readily understood by knowing the parts.
Interaction or interdependence	The parts must interact with each other so that the behavior can be complex. If they do not interact, the system will be simple.
Feedback	The system learns about the results of its actions and the learned information affects the system's next action. Positive feedback loops amplify the effects and negative ones dampen them.
Nonlinearity	The effect an input has on the system is not easily understood. An input may have no effect, a small effect, a linear effect, or even extremely large effects on the system.
Sensitive dependence on initial conditions	A small change can have a large effect (see: non-linearity) if the circumstances are such that the small change can lead to a phase transition.
Far from equilibrium	The properties of the system are changing constantly. As opposed to equilibrium where nothing changes.
Self-organization	The system (e.g. a group of people) does not need to have a designated director in order for it to organize so that it can better accomplish some tasks.
Adaptation	The ability of systems and their parts to change individual and collective behavior in order to respond to changing needs.
Fitness and fitness landscapes	Fitness tells us just how well (in this case) the organization is suited to the task. The landscape is a depiction of how different strategies relate to each other.

3 Review of empirical and literal findings

Referring to the empirical findings on the title, this chapter goes through some of the empirical work done with transaction cost economics. Literal findings, then again, refer mostly to the complexity side of things: these are further developments of the theory regarding the complex nature of our world. However, this is a short chapter because going into too much detail about the empirical findings is fairly pointless. The point of this chapter is to first show that TCE is not unquestionable, and then to show some developments from the complex systems for later use.

3.1 Studies on transaction cost economics

TCE is an empirical success story – research has been broadly corroborative of the predictions of transaction cost economics.

(Williamson, 2000, 605-607)

There have been hundreds of studies of outsourcing where transaction cost economics has been used as the theoretical background, either on its own or in conjunction with others. Since this study is not a literary review, all of them will not be explored. Instead, a few meta-studies are reviewed, and also a couple of regular ones to make a few points. While the findings are discussed here, their implications will mostly be discussed in the next chapter.

Everaert et al. (2010) studied how the transaction cost theory explains the outsourcing of accounting in Belgian small and medium-sized enterprises (SMEs). The study was originally extremely interesting since the study was meant to be about Finnish SMEs and their accounting – and TCE. So, very similar indeed. The reason why the study is very relevant even now is that SMEs are the backbone of all capitalist economies; financial sector aside, 499 out of 500 enterprises were SMEs, and they accounted for two thirds of all jobs and more than a half of total value added in EU in 2013 (Muller et al., 2014, p. 10).

The authors' work was a prime example of outsourcing in regard of TCE. They hypothesized that asset specificity, both types of uncertainty, and frequency would all correlate inversely with the level of outsourcing. To keep the story short, the hypotheses on asset specificity and frequency held, whereas those on uncertainty did not.

However, these results have a lot to do with how they are measured and not just what is really going on. Asset specificity holds on firm level, that is, the higher the firm thinks of the specificity, the less it outsources. On the other hand, on the task level things turn on their head: the simple task of invoice entry was outsourced only in 8% of the cases while for the more specific tasks of period-end and financial statements the shares of outsourcing far exceeded one third and a half, respectively.

Indeed, this could be explained by TCE in the following manner: invoice entry has a higher frequency so it is integrated; the statements are done more infrequently so they are outsourced. However, the same could be equally well explained by competence or resources: the firms that do not have experienced accountants must outsource the more difficult accounting tasks whereas the entrepreneur's teenage child can do the invoice entry cheaply and efficiently. Since Everaert et al. (2010) also found that the CEO's skills correlated inversely with outsourcing, this is quite a reasonable assumption to be made. Thus, perhaps transaction cost economics explained nothing much at all, but instead happened to coincide with the fact that the firms use whatever resources they have at hand and outsource the rest. This will be returned to shortly.

Ang and Straub (1998) studied the outsourcing of information systems among the banking industry in the United States. They found that both production cost and transaction cost economizing took place, and also that firm size correlated inversely with outsourcing. The important point of their study is that production cost savings were seen important by a factor of six to one compared to transaction cost savings. This point is taken up later on.

Now, for the meta-studies. Alagheband et al. (2011) conducted one in which they found that out of 25 TCE outsourcing studies, just nine found definitive support for the theory, and eleven – almost a half of them – found results that were either insignificant or contrary to the theory. The rest were mixed. Furthermore, if the dependent variable was the decision to outsource, the results were even worse for TCE.

Lacity et al. (2011) conducted another meta-study with similar results. In the 31 studies that they included there were in total 73 TCE constructs. They were split exactly in the middle: 36 supported TCE, 37 did not. Especially concerning for TCE is that asset specificity, which is by far the most important variable, was supported only in twelve out of thirty-three occasions, that is, just over once in three.

For both the Lacity et al. (2011) and Alaghehband (2011), the decisions to outsource were slightly less supported than the outcomes. This could indicate that while TCE is not used by the companies, perhaps it should. In fact, I do not disagree with this analysis: any theory that offers another point of view to be considered can be beneficial.

A prior study to the aforementioned sister studies was conducted David and Han (2004). In it, the authors performed more than 300 statistical tests from 63 articles which they chose very conservatively, that is, “selecting only published journal articles with clear and direct relevance to TCE” (ibid. p.51), and the support found was in the usual range: 47%.

Carter and Hodgson (2006) studied TCE with a critical twist, and they found similar support (and lack thereof) for TCE as the other theories. What is interesting in their study is that they point out two important facts that seem to go without much regard in other studies. First, one of the most important features of TCE, especially in this day and age, human asset specificity could well be explained by other theories, namely those that stress competence. Second, without the ability to measure transaction costs, other theories could more accurately predict behavior and outcomes even when TCE is supported.

Alaghehband et al. (2011) and David and Han (2004) take a more apologetic view: they claim that this contradiction between the theory and the results are due to poorly designed studies, that the theory has been “misappropriated” (e.g. Alaghehband et al., 2011, p. 126). That is, the reason why TCE is not supported by empirical studies is that the studies have not been properly designed. Perhaps so, but if the TCE is too difficult to grasp in order to be properly appropriated, then is it really a flaw of the scientists and not the theory? And if so, why is the theory not fixed, that is, why is it not operationalized by someone in a way that produces the results the theory predicts?

While Lacity et al. (2011) do not exactly disagree – perhaps out of courtesy – with Alaghehband et al. (2011), that is, they feel that TCE could be developed further to better explain IT outsourcing (ITO), they also write that: “However, we would argue that there are sufficient mixed results with applying TCE to studying IT outsourcing to suggest that other work may be even more important.” (p. 151). Indeed, their abstract says it well: “We argue that we are asking too much of TCE—the ITO phenomenon is more complex than can be accommodated by TCE.” (p. 139). To state the obvious, I agree, and I would also extend that to other areas than IT, too.

To summarize, the research on TCE is broadly mixed, not corroborative, and even when the theory is corroborated, it can quite well be explained by other theories as well. I believe this questions the validity of TCE. It could be that TCE does not hold, or that it is not used properly. Whether one takes the latter, apologetic view or the former, critical view, I believe one thing is a certainty: Williamson's quote that opened this subchapter must be taken with a pinch of salt. That is, to say that the jury is still very much out on TCE would probably be overly cautious, and on those grounds it is clear that TCE can be questioned.

3.2 Findings from complex system studies and literature

Bylund (2015) is thus far the only one I know of that has studied TCE with the methods that can help us understand complexity. In particular, he used agent-based modelling (ABM), a type of simulation, to test for Coasean transaction cost propositions. What the article shows is that propositions "high transaction costs cause integration" (P1) and "low transaction costs (and entrepreneurship) do not cause firms to form" (P3b) were not supported.

To put it mildly, this largely turns transaction cost economics on its head. As Bylund summarizes, Coasean transaction costs are neither sufficient nor necessary in explaining why firms are formed. If firms are not increasingly formed with transaction costs or decreasingly without them, what drives firm formation? Bylund shows that it is innovation. After all, it makes sense: if there is one player who can outpace all the others, then it is better to join that player than to wither away. Co-operation offers comparative advantage to players far beyond any reasonable scares of opportunism.

However, Bylund (2015) does establish a link between the effect of transaction costs and specialization. This might implicate that the idea of asset specificity is of high importance. But another finding suggests that it is actually not: Madhok (1996) points out that lower transaction costs lead to lower profit for agents within organizations, a finding Bylund also refers to. This point is interesting, and relates to an underlying idea I have about transaction cost economics not explaining anything at all, at least when humans are considered. That is, completely regardless of the boundaries, in a linear setting there are (if there are) opportunistic tendencies when asset specificity is high. An employee is largely free to change jobs, and thus highly specialized workers can use their specific skills to demand higher wages – or leave.

Moving on to a completely different type of finding, the Taleb quadrants, as they are often referred to (Kenett and Tapiero, 2009), are another look at the risk quadrants. Traditionally, risk has been divided into four quadrants according to their probabilities and

impacts (high/low for each). However, Taleb (2008) uses another classification: probability *distribution* and payoff *complexity*.

Table 3-1: Taleb quadrants

	Simple payoffs	Complex payoffs
Type 1 or thin tails	Q1	Q3
Type 2 or fat-tailed/unknown	Q2	Q4

It might be helpful to explain the effect of probability distributions. For example, a normal distribution (that takes the shape of a bell curve when drawn) is one in which the deviation from the mean is exponentially rare. For instance, the 68-95-99.7 rule states that 68% of the observations are within one standard deviation, 95% are within two, and 99.7% are within three standard deviations.

An example is IQ: the mean is 100, and there are several different standard deviations used, most common of which is 15. So for instance, only 0.3% of the population have an IQ of higher than 145 or lower than 55. The limit for Mensa is that you belong in the highest 2% so you need to exceed 130 (95% are within two standard deviations so half of the rest are outside and in the above half). Because the rarity increases exponentially, six standard deviations out happens only in about one case in 500 million. Thus, there are about 160 million people in the world that could get into Mensa, but only about seven people whose IQ exceeds 190. So extreme cases are extremely rare.

However, for fat-tailed distributions this does not hold. Money is an excellent example. The mean wealth of a family in the U.S. has been around \$500,000 for some time, and the standard deviation is in the same range. Thus, if wealth was normally distributed, there would be about one family in the United States whose wealth exceeds seven times that, or \$3.5M. This is obviously not the case. There are, in fact, *hundreds* of families whose wealth exceeds that by seven *thousand* times or more. There are, in fact, a few *individuals* whose wealth exceeds that by *seventy thousand* times.

For most businesses, this is not relevant, but for some, it is very much so. Especially those who work with money, that is, in the financial sector. Mentally, however, it is relevant for others, too. For instance, if a company is relying on one big customer, its historical variation of order amounts does not reveal the true risk. If standard deviation has been, say, 50 units and mean is 1000 units per month, and the one big customer is half of that, it should realize that the

likelihood of dropping to less than 700 is not one in five hundred million months (or one in 40 million years), i.e. something that does not need to be taken into account. Indeed, the triple-A credit rating signifies a 0.2% default probability annually so even that means it will happen once every 500 years meaning it is 80 thousand times more probable than the bell curve suggests. Likely, however, the issues are related to market problems: for instance, Nokia's sales of mobile phones went from 450 million in 2010 to 250 million in 2013, whereas iPhone sales soared from 40 million to 150 million. The parts used were different, so clearly this has had a large effect on the suppliers. What are the odds? 1%? 2%? 5%? It is a million times more than a bell curve predicts.

The Taleb quadrants are described in the following way. In the first quadrant, the payoffs are either binary or of a small range, such as heads/tails or a person's weight. This quadrant works very well with statistics: distributions follow models (e.g. Gaussian or Poisson distributions), and the variance-based expected value models are easily used.

The second quadrant is characterized by events that are extremely rare and usually binary. While the tail events can be catastrophic, they are usually quite simply protected against by using insurance (and by not being a sucker, to use Taleb's wording). For instance, houses do not burn down that often, but they do, sometimes, and when it happens, it can be disastrous – unless the house was insured (assuming there was no-one inside).

The third quadrant is somewhat messier than the first quadrant since the outcomes are complex, but here the statistical methods work quite well also. Because the distribution is merciful, that is, extreme events are extremely rare, it is quite possible to build in enough resilience and redundancy into the system: for instance, a human body is very complex indeed, but it is resilient because it can heal itself and adapt – and speaking of redundancy, it comes with a replacement kidney.

The fourth quadrant is the danger zone, or "Black Swan domain" (Taleb, 2008, p. 8). The tail events are more common than the variance-based distributions would suggest, and the outcomes are complex, even chaotic. The classic example of this is leveraged finance, Taleb's own field, where the agents are strongly interconnected. As a heavily leveraged company goes down after just a few percentage points' drop, its interrelations can bring down the next one, even further increasing the odds of the one after that failing as well, possibly causing a cascading failure of the markets.

Normal businesses are generally speaking in the third quadrant, or between the third and the fourth. They need to make complex decisions and they are interconnected to other actors, but because they are not heavily leveraged, they can often endure quite a lot of beating before collapsing.

Moving on to complexity within organizations and to one of the most important sources of inspiration for this thesis: Ralph D. Stacey's book *Complexity and Creativity in Organizations* (1996) explains in detail the complex processes that take place in organizations.

The important take home message for the understanding of this thesis is the understanding of dual networks. Stacey (1996) posits that organizations have two networks, the legitimate network and the shadow network. The former is described by Stacey (1996, p. 24-26) in the following manner:

The first type of network — consists of links that are either (1) formally and intentionally established by the most powerful members of an organization or (2) established by well-understood, implicit principles that are widely accepted by members of the organization — that is, a shared culture or accepted ideology. — These links — establish the nature and direction of the authority and responsibility of each individual agent in relation to others and to the primary task; in doing so the links constitute a legitimate network system consisting of a hierarchy, a bureaucracy, and an approved ideology. — The links in the legitimate system are linear in the sense that: one and only one response is permitted for any given stimulus; any outputs are proportional to inputs; the system is not more or less than the sum of its parts. — The boundary of this legitimate system is clear-cut: either particular agents are members of the system or they are not. Furthermore its purpose is clear and relatively easily understood: it is to perform the current primary tasks of the organization so that the organization survives.

The legitimate network, then, is what could be described as the traditional view of the organization: it describes who does what, how things are done, and who has power over whom. In essence, it is a clockwork-like view of the organization: it describes how the proverbial gears are set, and expects that certain inputs here lead to certain outputs there.

The shadow network, unsurprisingly, is quite different (Stacey, 1996, p. 26-27):

The links are spontaneously and informally established by individual agents among themselves during the course of interacting in the legitimate system. The result is another network, a kind of shadow of the legitimate system consisting of informal social and

political links, in which agents develop their own local rules for interacting with each other in the course of that interaction. Some of those rules come to be shared in small groups, or even across the whole system: in other words, group and organizational cultures develop that are not part of the officially sanctioned culture or ideology. Other rules of conduct within this shadow system, however, remain specific to individual agents. — These shadow rules constitute a repertoire of thoughts, perceptions, and behaviors that are potentially available to an organization but are not currently being utilized for its main purpose. Instead, the shadow system serves a myriad of other diverse purposes that are often quite difficult to understand. These purposes range from individual politicking to unofficial efforts to support or sabotage the legitimate system. The shadow system is quite clearly nonlinear. Many possible responses to any given stimulus are possible and those responses may be more or less proportional to the stimulus. — Furthermore, the phenomenon of group processes, which cannot be explained purely in terms of the individuals present, indicates that an informal social and political system is more than the sum of its parts. — In the shadow system, interactions take more diverse forms than is usual in the legitimate system: for example, added to flows of information, energy, and action are flows of emotion, friendship, trust, and other qualities. — The boundaries of the shadow system are fuzzy and normally do not coincide with the clear-cut boundaries of the legitimate system. The shadow system extends into and overlaps with the shadow systems of other organizations; indeed, shadow networks are probably the principal route for interaction between organizations simply because they have sufficiently porous boundaries.

The shadow network, to summarize, is affecting the organization, although officially not a part of it. It is nonlinear by definition, and as we see, other legitimate and shadow networks affect them, which in turn affects the organization.

The core point here is that organizations are complex systems that have feedback mechanisms on all levels. Because of this, linearity cannot be expected, and because it cannot be expected, a linear estimation such as TCE will always be problematic. One will also see that these shadow networks affect behavior, for instance meaning that good relations between the contractor and the supplier most likely prevent opportunism.

4 An argument against TCE in outsourcing

This chapter looks at transaction cost economics from the perspectives of complexity and economics. Every dimension and construct of TCE is addressed individually in order to point out where TCE *may* provide wrong answers. Indeed, I do not wish to claim that using transaction cost economics is *always* going to give a wrong answer, but that it will do so sometimes, maybe even more often than not, but not always.

The point is that using a flawed formula should not be encouraged although it could sometimes give the right answer. In other words, one should not say that addition and multiplication are the same although $2 + 2 = 2 * 2$. While this is an exception, consider what Taleb (2010, p. 363) wrote: “When you invest, you do not care how many times you gain or lose, you care about the cumulative, the expectation: how many times you gain or lose times the amount made or lost.”

4.1 Why firms are formed

It is reasonable to start with the very foundation of organizations. Under the transaction cost economic paradigm, as set by Coase (1937, p. 390), it was argued that the primary function of the firm is overcoming the cost of using the price mechanism. However, this is not the case. Bylund (2015) shows that the primary reason why firms are formed is innovation.

I would go on to argue that there is in fact something else that even better explains the formation of firms. My argument for this is based on the fact that innovations could be pursued even without the formation of firms (although due to legal restrictions, this is not necessarily the case, but theoretically so). Also, not all firms strive for innovation – some are just formed to support (self-)employment. I argue that the primary function of the firm is devising a legal entity which separates the entrepreneur and the firm.

There are three reasons for the separation of the entrepreneur and the enterprise. The first reason is practicality: even if the firm would consist of only one employee and does not aim for growth (e.g. a self-employed accountant), it is practical to separate the person and the labor, i.e. what is done as an individual and what is done as a worker. This helps with accounting (which is useful whether or not forced by the law), for instance.

The second reason is the divisibility of the firm. Companies that look to grow or change are usefully divided: the company can receive all-important funding in the early stages, or they can be more easily rearranged as the company switches focus and sells a part of itself or buys

a part of another. Conversely, a person is extremely difficult to divide. Certainly, one can sell shares of one's own income, but the rest of it is impossible (and returns to the first reason).

The third and the most important reason is risk. Or rather, it should be. A firm can take risks a person cannot. Or rather, should not. Consider Lloyd's of London Names. Lloyd's never went bankrupt (it is a society), but very many Names did because of the special arrangement Lloyd's has used. Lloyd's had decades earlier insured companies that faced multi-billion charges from people who had fallen ill (or from relatives of those who had died) from working around asbestos. An insurance company may have gone bankrupt, rendering investments into it worthless.

But Lloyd's works differently: the Names *personally* back up the insurances, in this case leading to catastrophic losses for many investors. Had it been a firm it would have merely paid what it had, and not a penny more. The investors would have been safe, and the debtors left with whatever the company was able to wring out of its coffers.

Clearly, the first two reasons can also be linked to risk. For the first part, there are two ways. First, someone might live financially on the edge as a person, but a personal default will not lead into bankruptcy for the company, and vice versa. Second, a medical doctor could make a mistake, but it is the MD Ltd. that faces bankruptcy after a mistreatment. Also, if the doctor makes a mistake, say, falls asleep driving, causing an accident, it is the doctor that is made to pay, but he can still practice medicine.

On the other hand, divisibility means that if a firm sees that it needs to change strategy, a part of the organization can be sold and the money used to redirect the operations. This provides the firm with options, enabling change and thus hedging against risk.

Technically, there are two things that risk reduction is about: fourth-quadrant risk reduced into third-quadrant risk, and capping the second-quadrant risk. The former refers to controllability of risk: because of the feedback a small perturbation that takes the system over the edge may (or rather, will) lead to chaos and potentially cascading failures (e.g. becoming heavily indebted without a house). The second-quadrant risk then again can be capped, stopping the cascade, and that is exactly what is done here. Losses will occur, but not intolerable losses.

It is worth noting, perhaps, that the nature of risk does not change, but the firm works as an intermediary, and the risk that was facing the investor now faces the firm. Thus, founding

a firm rather than taking on an enterprise as a person gives a payoff function equal to that of an option compared to the one of buying stock.

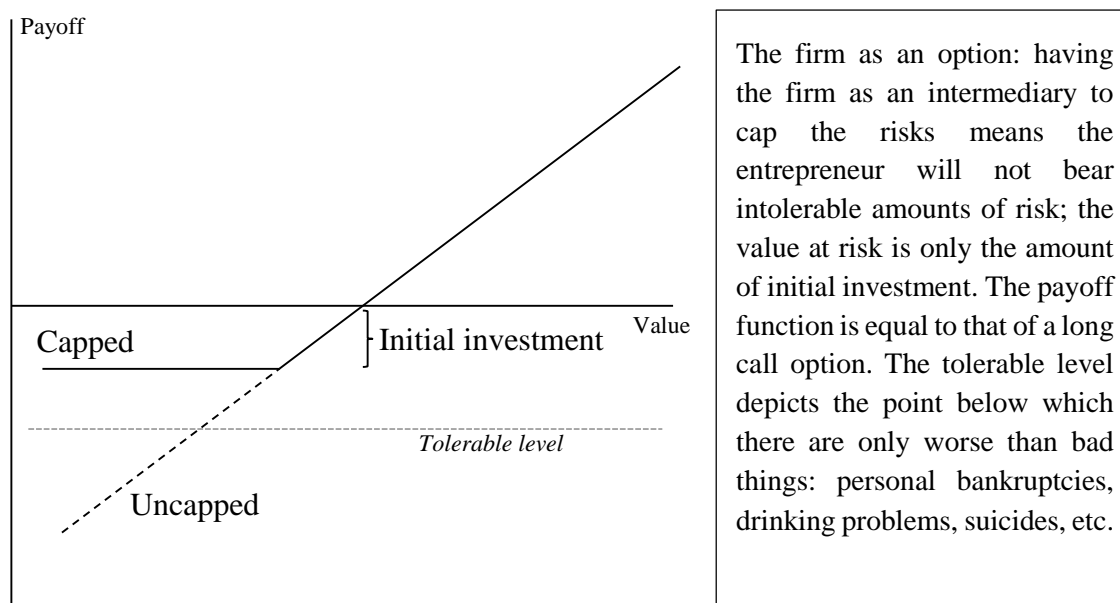


Figure 4-1: The firm as an option

I thus believe that the transaction cost tradition answers a completely wrong question: transaction costs are supposedly the costs of doing business, and equal to friction. However, the reason to found a firm is not to overcome friction, but instead to overcome risks that would be otherwise intolerable.

The formation of groups or organizations (which develop into firms), then again, happens because of what Bylund (2015) showed. Innovation sets the wheels in motion, and there is competition in which the fittest survive (note the plural: there can be several incumbents with different strategies competing on the same landscape) – and fitness can be improved by joining forces because of the synergies.

4.2 Asset specificity

Asset specificity is the absolute cornerstone of the Williamsonian TCE. Opportunism and bounded rationality are always assumed, and thus asset specificity is what determines the mode of governance. I argue that this is not the case. This can be approached in two ways. First, let us start with the definition of asset specificity: an *asset* is said to be specific when it is more

valuable in its current use than elsewhere. The words in italics are the problem. What is *the asset*, and what does *valuable* mean?

In some cases these are simple to the point of being truisms. For instance, Williamson's example (1981, p. 556) of the cheek-by-jowl logic considering a blast furnace and a rolling mill is, as Williamson (*ibid.*) points out: "thought to be so 'natural' that alternative governance structures are rarely considered". The assets are obvious (two pieces of equipment) and value is easily measured in money (savings in heating and transport).

In some cases, though, it is much more difficult to understand the asset and the value. For instance, consider an entrepreneur, say a technically-minded innovative engineer, that has no idea about how to tackle the issue of accounting. For him, the asset is *accounting* and the value is *you gotta do it 'cos the law says so*. The asset for the firm is thus a *black box system*, something with inputs (invoices, loan bills etc.) and outputs (reports, balance sheets, financial statements), but without much understanding of what happens inside the box. Although in this case there is specificity and behavioral uncertainty (if one does not understand accounting, the accountant can do quite poorly and still it may be viewed as a job well done), outsourcing is likely preferred.

In another vein, let us consider someone who actually understands accounting. In that case, the asset can be considered *labor*, not *accounting*. In that case, the labor is thought specific if it is more valuable in its current use than in any other use. Clearly, it is more valuable if one compares accounting one's own firm of which the entrepreneur has some knowledge and doing the accounting for another firm. But if one considers the labor, perhaps it is used to create more value added doing the core business rather than working on a support function. A blast furnace cannot be transformed into a helicopter effortlessly, but the operator of the furnace can well be an apt salesperson.

Valuing for small businesses can also be quite difficult. Let us assume that a specialist can do in an hour what the entrepreneur can do in two. However, the entrepreneur can increase the workload without pay (the cost of the extra two hours is equal to the one hour of specialist work), and if there is nothing better to do, he can take over from the specialist. In this case, the asset needs not be specific at all in order to be integrated: the boundaries of the firm violate the TCE predictions.

Let us move into a more complex territory and claim that assets and their specificities can change and be changed. Assets can change or be changed means that systems thinking of

the assets enables to view jobs, assets, and everything else in the firm more closely. Assets can thus be broken into parts and rearranged. This alone can lead to non-specification of certain assets and increasing specificity of others.

However, changes in asset specificity refers to another thing: to the ever-changing sources of competitive advantage. For instance, a company might follow a strategy of integration because capable suppliers simply do not exist, or because interfaces are incompatible. Later in time, the company can switch into a modular strategy regarding the same product and move into other areas with integrated strategies.

Christensen and Raynor (2003) show why: when products are *not good enough* firms need to adopt a strategy of integration in order to produce the best possible product since the product's performance depends greatly on the interconnections between parts. On the other hand, when the products are *more than good enough* (meaning: the level of technical advancements exceeds the ability of customers to adopt them) firms start to compete on different things; price, delivery times, etc. Value and thus specificity changes, and the changes can be quite rapid and violent, especially when it comes to technology.

Because of these, assets that are valuable and specific today, can become *anti-specific* tomorrow. Since specificity means it is of more value and generality or non-specificity means equal value everywhere, anti-specific obviously means the asset is of less value than anywhere else, roughly meaning that the constellation of assets that the firm is would be better off by ending its operations, selling everything of any value to the highest bidder and keeping just a few employees to remain as a patent troll.

4.3 Bounded rationality

According to TCE, bounded rationality is always to be assumed. The assumption is not challenged, but its effect on sourcing needs some clarification. First, it is argued that bounded rationality is misappropriated by Williamson. Second, it will be suggested that bounded rationality is used, for better or for worse, but in a different way from what TCE suggests. Finally, the implications of limits of rationality are questioned in totality.

Everaert et al. (2010) found, as mentioned, that economic-oriented background and university education are inversely correlated with outsourcing (of accounting). The only TCE construct that can explain this is bounded rationality. However, Williamson has somewhat misappropriated that term. He claims that humans are “intendedly rational, but only limitedly

so”, and although that is a direct quote from Simon (1957), this is not what bounded rationality refers to. Bounded rationality is not intended rationalism, it is knowingly limited rationalism. The process of decision making follows that of a rational process (i.e. establishing options and their payoffs and their likelihoods, then making a decision), but relies on heuristics (simplifying information seeking and processing, which is what Williamson means, correctly, but that is only a part of the larger picture) and simplifying payoffs.

Instead of following Simon’s limited rationality as such, in practice (referring to the abovementioned findings) the entrepreneurs’ decisions seem to follow a heuristic called the recognition principle. To rewind a few steps, if knowledge of accounting (safely, I believe, assumed to be correlated with financial/university background) leads to less outsourcing then it should be assumed that accounting is, even in the SME scale, highly specific. However, Everaert et al. (2010) also found that for more highly educated CEOs, asset specificity was *positively* (although non-significantly) correlated for routine tasks. The recognition principle states that “if one of two objects is recognized and the other is not, then infer that the recognized object has the higher value with respect to the criterion.” (Goldstein and Gigerenzer, 2002, p. 76).

What seems to be going on, in line with the recognition principle, is that if the entrepreneur does not have a gut feel about how to tackle the issue (of accounting), he outsources and someone else takes care of both the planning and the execution of the issue. This takes the full picture of bounded rationality into account: payoffs are simplified between integration (feelings of difficulty and inadequacy – not good – for the non-skilled and feelings of control and power – good – for the skilled) and outsourcing (feelings of simplicity and empowerment – good – for the non-skilled and feelings of insecurity and loss of control – not good – for the skilled). Unless, of course, one remembers that Everaert et al. (2010) also found that trust is a controlling variable here: if the more skilled CEO trusts the partner, the negative feelings about outsourcing are diminished or positive feelings compensate for them.

This takes bounded rationality into account in its entirety. Thus, bounded rationality is indeed something to take into account (although it seems to be massively endogenous to the competence-based theories, i.e. when one takes into account the skills within the organization prior to the decision), but perhaps not in the manner Williamson means.

This leads to the final point: limits of rationality are very real, but they do not matter much. Indeed, Goldstein and Gigerenzer (2002) also found that further information does not

necessarily improve decision making – instead, it can make it *worse*. The availability heuristic, stating that if something is easily recalled it is thought to be important, helps to understand why. Tversky and Kahneman (1973, p. 231) wrote:

Most important decision men make are governed by beliefs concerning the likelihoods of unique events. The “true” probability of such events are elusive, since they cannot be assessed objectively. The subjective probabilities that are assigned by knowledgeable and consistent people have been accepted as all that can be said about the likelihood of such events.

There are unforeseen events, positive and negative, both because and regardless of the boundaries of the firm. An expert of TCE sees everything through TCE and an agency theorist sees everything through his lens. The boundaries of rationality do not matter without opportunistic tendencies. Next we will see why we do not have to pay much attention to those.

4.4 Opportunism

In TCE, opportunism is to be feared. Williamson orders us to safeguard against the hazards of opportunism (1985, p. 32). In fact, I do not disagree, but I disagree almost completely how this is achieved. My argument is two-sided. First, one must fear the type of opportunism described by agency theory, i.e. the agent-principal problem. Second, I argue that opportunism has very little to do with organization.

As was pointed out, agency is about the contract. In short, the agent-principal problem is caused by an asymmetry between the agent’s and the principal’s best interests. While this type of opportunism is very real and possibly even dangerous, it can be equally likely and destructive regardless of firm boundaries. Indeed, if anything, it will be easier to control this type of opportunism through outsourcing which enables the periodic sorting of employees through the rewriting of contracts.

The whole point of agent-principal problems is that the contract, whether explicit or implicit, is such that it directs the incentives of the agent in the wrong direction. This can happen by either active misdirection (e.g. rewarding for increasing ROA, thus encouraging to sell off functions rather than looking forward, thus directing the employee to the wrong direction) or by passive non-direction (e.g. rewarding low-level workers for enterprise results (which automatically means they are also punished for sub-par results) although any one of them has only a minuscule effect on that; thus, the rewards do not direct the employee to the

desired direction). Opportunistic behavior can happen mostly with the former (the differences can be huge), and in the case of non-direction opportunism is mostly related to avoidance of working.

The difference between the agent-principal opportunism and TCE opportunism is that agency opportunism is *approved opportunism*: it is sanctified by the firm that wishes to avoid the opportunism. Thus, it really is in the agent's best interests to behave opportunistically (at least to some extent). TCE opportunism faces feedback problems: opportunistic behavior can lead to integration, and to a loss of reputation. As Hill (1990) points out, the *invisible hand* tends to push these opportunistic suppliers from the market. Opportunistic employees, then again, are very, very rarely pushed out of the market.

Although asset specificity can be claimed to be the most important construct of the transaction cost paradigm, it is that only because of opportunism. Indeed, Williamson (1993, p.97) claims that: "But for opportunism, most forms of complex contracting and hierarchy vanish." This is quite simply not true. It is true for the internal logic of TCE, but not true in the real world.

For instance, consider a flat and a hierarchical organization. A hierarchical organization is better at avoiding type I errors (false positives) whereas a flat organization is better at avoiding type II errors (false negatives). This is because in a hierarchical organization a decision needs more approvals than in a flat one.

For example, a franchise does decisions that affect the entire franchise hierarchically in the headquarters, but leaves daily decisions to franchisees; the decisions where false positives can have fourth-quadrant negative impacts should not be left to be done ad hoc by a franchisee, but then again it would be needless to harness the power of Ph.D. analysts, project managers and C level executives (with their respective costs) to decide whether to give people a free access to the toilet. Hierarchy needs not be costly in the TCE manner because it can be a source of synergy and efficiency.

4.4.1 Game theory

That strategic rivalry in a long-term relationship may differ from that of a one-shot game is by now quite a familiar idea.

-Fudenberg & Maskin (1986)

The above quote continues: "Repeated play allows players to respond to each other's actions, and so each player must consider the reactions of his opponents in making his decision. The fear of retaliation may thus lead to outcomes that otherwise would not occur." (Fudenberg and Maskin, 1986, p. 553). The point of this quote should be clear by the end of this chapter.

Game theory is a very useful theory to bring into the discussion. As Spaniel (2011, loc. 48) points out, the game theory studies interdependent actions, or in the author's words: "Situations where my actions affect both my welfare and your welfare and vice versa." Thus, game theory discusses by its very nature complex things, and many game theoretic dilemmas can be thought of in TCE terms when they are simple, one-off games.

The basic idea of game theory is that each agent has several options at any point of time, and the agents must choose a strategy that yields the best outcome for the agent him or herself. The prisoner's dilemma is an example where for the each agent opportunistic (in terms of TCE) behavior dominates cooperative behavior. However, the best strategy changes when an iterated modification is played, that is, the game is played repetitively. In this chapter, I will show that the best strategy is very, very rarely an opportunistic one.

The game theory aficionados have already likely linked the previous chapter to their theory-based reasoning. Indeed, game theory gives us similar results. Furthermore, game theory even shows us that opportunism is not a problem except in two very specific cases which means that incomplete contracts are not bound for opportunistic behavior. The specific cases are, first, a take-the-money-and-run situation where either of the parties is in a dead end in any case, and second, short-sightedness. The former of these will be returned after a while, but the latter is shortly discussed here.

Short-sightedness means that a player plays a dominant strategy in a subgame, not understanding that it is only a part of a (very much) larger game. The problem is, the latter is not a zero-sum game, but a sub-zero-sum game: it does not share the pie differently, but in fact throws away the pie. An example of short-sightedness would be to take a potentially lethal overdose of medication for an annoying headache. It solves the immediate problem, but in doing so causes much more severe problems for the agent.

The games in tables 4-1 and 4-2 show the inherent TCE logic. Integration always produces similar outcomes for both parties: the prospective contractor gains 2. The gain is 2 and not 3 because while it gets the job done, it is more costly than the job would be on the market. Thus, market would be a better place to be considering just the production costs. The

supplier's gains when in contract are two in the non-specific and three in the specific case because specificity increases the value.

Outsourcing then again produces different results. When the asset is non-specific, outsourcing and cooperation weakly dominates other options: the contractor does not care about opportunism because it is easy to switch, and thus outsourcing is strictly dominant, that is, the best strategy regardless of the other party. For the supplier, opportunism is a bad idea because cooperation weakly dominates opportunism, that is, under no conditions is opportunism a good idea.

Table 4-1: The game without asset specificity

		Supplier	
		Cooperation	Opportunism
Contractor	Outsourcing	3,2	3,1
	Integration	2,0	2,0

In turn, specific assets change the game. Again, integration produces a decent result regardless of opportunism. Cooperation produces the best possible result because here the contractor enjoys production cost savings and the contractor gets a higher return than for non-specific assets. However, opportunistic strategy again weakly dominates, so there is incentive for that.

There is no questioning this. Williamson (1983) even offers a clear tool to support this beneficial exchange: credible commitments (a term used in game theory also). Everything looks to be in order, and that's that.

Table 4-2: The game according to transaction cost economics under asset specificity

		Supplier	
		Cooperation	Opportunism
Contractor	Outsourcing	3,3	1,4
	Integration	2,0	2,0

However, everything is not in order. This is because the actual game that is played is a multi-stage one, and this means that the credible commitment exists whether or not there is hostage-swapping (e.g. common ownership). Initially, there must be outsourcing for this game

to take place, so payoffs are 3,3. Then, in the second stage, the supplier gets to have a go. If it chooses opportunistic behavior, payoffs are 1,4. However, at a later point in time, the contractor gets to have a go first. If there is suspicion of opportunism, it will choose to integrate. Thus the payoffs will be 2,0.

For example, consider this game where the supplier behaves opportunistically at stage three. The stages are time-dependent, but they are not necessarily any specific amounts of time, like years. For instance, if the contract is set for two years at a time, each stage could be seen to be two years.

Table 4-3: The payoffs with asset specificity with opportunism in stage three.

Stage	1	2	3	4	5
Contractor	3	3	1	2	2
Supplier	3	3	4	0	0

Is it really beneficial for the supplier to behave opportunistically? No. It will lose the contract entirely and that leads to no profits at all. This is why there is no threat of opportunism, ever, in the standard case.

There is, however, a special case where opportunism might occur. This is one in which the other party knows that the game is coming to an end, and the other one does not. Note that "the game" here refers to not only the current transaction, but transactions for one party altogether. That is, a contract might be coming to an end, but if there are other contracts as well as possible future contracts, then the game is not over. Thus, it could be for instance a case where the seller is trying to get as much money out as possible before escaping the law to a paradise island. Needless to say, any dealings with such a *partner* should be avoided entirely, at least in legitimate businesses.

So for instance let us assume that the current transaction is coming to an end, and view this first as a discrete, 5-stage case. In this case, the payoffs would look like this:

Table 4-4: Opportunism at the endgame.

Stage	1	2	3	4	5
Contractor	3	3	3	3	1
Supplier	3	3	3	3	4

However, in a much larger picture, let us assume that the company has in total five contracts, and one of them is coming to an end, and it will be looking for a replacement. In each of the following periods, one of the other contracts is coming to an end, with a replacement to be found. Here the payoffs would look like this:

Table 4-5: Endgame opportunism in a larger scale.

Stage	1	2	3	4	5	6	7	8	9	10
Contractor	3	3	3	3	3/1	N/A	N/A	N/A	N/A	N/A
Opportunism	15	15	15	15	16	13	10	7	4	0
Cooperation	15	15	15	15	15	15	15	15	15	15

Clearly, this is a simplification, but the point is that if the supplier is known for opportunistic behavior, its revenues will in the long run converge to zero. In turn, the company can expect to maintain its current level of activities when it cooperates. Thus, if the partner is looking to keep going, there are no real scares of opportunism.

Another point to be considered from Table 4-4. Even if there would be some scares of opportunism, one should not be usually too worried about it. This is because in the discrete, 5-stage game one gets $4*3+1 = 13$ if you outsource and the supplier is opportunistic, but only $5*2 = 10$ if one integrates. Savings of just over 20% are quite often reported (e.g. Han and Mithas, 2013; Jackson et al., 2001); this is similar as the difference between 13 and 10 points. Theoretically, TCE takes this into account, but not really. That is, the (potential) costs of opportunism may be a reason to integrate, but they need to be absolutely massive in order for it to be productive to integrate.

4.5 Transaction costs

The transaction costs themselves need to be questioned. Indeed, even Williamson has started using the term maladaptation costs (Klein, 2014).

Be as it may, let us look at the transaction costs. Two types of transaction costs were identified: ex-ante and ex-post costs. While it is clear that all types of transactions, whether within organizations or at the market, carry these costs it is also clear that the significance of ex-ante costs converge toward zero. Of course the costs themselves do not vanish, but as the

contract incurs more production and ex-post transaction costs the share of these one-off ex-ante costs withers away. Thus, unless the ex-ante costs are extreme their investigation is somewhat tangential.

The ex-post costs then again are more important. Let us look at those in more detail, and see if they are only occurred at the market.

Maladaptation costs were those of re-defining the contract when it is not meaningful anymore. Clearly, these costs are incurred even within integrated firms. It is useful to distinguish two types of maladaptation: I shall call them positive and negative. Positive maladaptation is a situation where an asset is clearly valuable to the company, but it needs to be altered in some way. Negative maladaptation, unsurprisingly, is when an asset no longer remains valuable, and needs to be done away with.

An example of positive maladaptation could be such where an employee has other options, or in plain terms wishes to leave for a better (paying) job elsewhere. Here, the firm must provide the employee with a better offer, or lose the investment in firm-specific human capital, that is, the value-creating on-the-job learning acquired by the employee. The situation can lead to two different scenarios.

First, the contracting organization is not made aware of the situation by the supplier. Hence, the supplier bears the risk from finding another employee (or needs to shave its margins by offering a higher wage). The performance falls, but costs remain the same.

Second, the contracting organization is made aware of the situation. The contracting organization can either integrate the employee or change the contract with the supplier on the condition the supplier retains the employee. The performance remains the same, but costs go up. There seems to be no difference whether the asset is outsourced or integrated when maladaptation is positive.

For negative maladaptation, it all depends on the salvage value. If it is higher, then owning the asset will be better. However, there are two issues. Firstly, asset maladaptation cannot be predicted, and so the potential salvage value is a mystery. Secondly, and more importantly, specific assets by definition ought to carry lower salvage values, *ceteris paribus*.

For non-salvageable assets (i.e. human assets), asset specificity does the same. If for the person the current employer is the only option (e.g. industrial workers in factory towns), it

will be difficult to get rid of him. If outsourced, the contract will end one day. If integrated, it will not, and that will be more difficult, or at least more costly.

It must be pointed out that these points only mean that there is really no way of telling in advance whether the total costs will be higher or lower, whether there is room for more or less opportunistic behavior under maladaptation given higher or lower asset specificity. This really underpins the problem with transaction cost economics: sometimes they seem to be correct, sometimes not. But it should be remembered that even a broken watch is correct twice a day.

For the other ex-post costs, haggling meant filling the blanks. If there are several possible suppliers, there is no reason to expect severe haggling costs: the blanks can be left unfilled, and another supplier hired to fill in (or do the same internally). Moving forward, this means that at the end of the contract the opportunistic haggler can be removed from the equation if the fill-in supplier is willing to take over the tasks. Indeed, it can even hire away the people from the nasty haggler, meaning the business can continue as usual, same work done by the same people, changing just the name of the employer.

Governance costs are actually the real deal. They occur and must be taken into account. Indeed, if there is severe behavioral uncertainty and the asset is very valuable (regardless of specificity), I can see that the potential production cost savings could be offset by the governance costs. So they must be taken into account.

Bonding then again can sometimes be somewhat costly. Usually they are not much more costly than when integrated since there are also internal rules (processes) that provide for security, also sometimes at the cost of effectiveness. Offshoring could increase these costs: if the supplier needs to contact the contractor, it could result in large delays if the time zone difference is large.

Finally, the description of transaction costs as friction is a poor one. Indeed, transaction cost economics would be great if transaction costs were in fact friction. There are two different problems with the view of transaction costs as friction. First, production costs, not transaction costs, are friction: they are the motion-resisting force that must always be overcome. The reader may or may not remember the note on Ang and Straub (1998) in the literature section: while transaction costs were not completely irrelevant, production cost savings were seen six times as important as transaction costs. Here is why: no strategy that buys for \$2 and sells for \$1 will

work in the long run. However, if one buys for \$1 and sells for \$2, one will make money, and if transaction costs occur at some point, they can be adapted to by, for instance, integration.

The other problem is that of measurability. Friction is not something that appears or disappears out of the blue. The amount of friction in (simple, linear) physical systems can be predicted quite easily with great precision. If the price – that is, the driver of revenue which is the energy source – takes into account some wild amount of friction "just to be sure", it will definitely be too high for anyone to buy the product. One does not put an airplane jet engine on a bicycle.

4.6 Uncertainty

Uncertainty in transaction cost economics is divided into two categories: environmental and behavioral uncertainties. The former refers to volatility in demand, and the latter to how easy it is to measure the outputs (i.e. protecting against opportunistic behavior). Both kinds, it is argued, lead to higher transaction costs.

First, I argue that environmental uncertainty should lead to higher rates of outsourcing, not lower. Second, I argue that integration does not help with the issue of behavioral uncertainty.

The argument for the higher rates of outsourcing derives from the very same explanation that in TCE is used for the opposite argument. Indeed, it is probably easier to allocate resources to different tasks within the firm than it would be outside it (due to e.g. bonding costs), but the problem is that specialized employees are better at doing their specialties rather than switching into other tasks.

In fact, we need nothing else than the law of large numbers to disprove the original position. Suppose a company specialized in accounting takes charge of the accounting of a number of companies. The larger the number, the better, but any number above one will do. Since the law states that the mean of the sample converges toward the population mean as the sample size increases, the volatility diminishes. This is due to the fact that one accountant can quite easily take over for the other since the firm uses largely the same tools and procedures regardless of the client.

Why this is more important when the volatility is high than when it is low is that when the volatility is low one can expect that the employee will do what he is good at doing for most of the time, and if the demand is surprisingly high for a short period of time extra hours can be

put in. Thus, the volatility pooling done by the specialist organization is of less use. (This is actually also a prime example of how difficult it is to compare actual assets: the service offered by the supplier is not the same service that would be produced internally.)

Feedbacks within the organization come to play, also: when does the accountant have more to do? When there are more things to do in general. If invoices need to be handled by the accountant then there is more to do when there are more invoices. Obviously, there are more invoices when there is more sales meaning the production department, the sales people, etc. all have more to do. This is a positive feedback loop.

The danger with positive feedback was already mentioned, and the way in which (in this case) the loop can be more or less stopped is sharing. If two or more companies share a market, that is, they are playing a zero-sum game (at least in the short term), then the way they can get more accountants is to use a shared source. If one company increases its sales, the other companies' share of the pie becomes smaller, but the share source remains somewhat stable. Thus, the dangerous positive feedback loop was countered with negative feedback.

Generally, though, this is not the case as the companies' sales are likely to be mostly independent of each other (although both are dependent on the market situation). Even in this case outsourcing is better. If one company employs a CEO and five other people, the doubling of tasks requires the doubling of manpower leading to growing governance. However, if those five people are all employed by their respective specialist agencies, then that means that each of the five agencies needs to hire just one new person. This is most likely why outsourcing better enables companies to pay employees by the hour (or use a piece rate). It is much more difficult for a company to constantly hire and fire people according to changing needs than to call the agency and let them know that they will need more services.

Integration, I believe, can only help with explicit opportunism, but not with guileful behavior. In case of maladaptation, one side can behave opportunistically by refusing to alter the contract (or charging all alteration costs – and then some – on the other side). This type of opportunism can be guarded against with integration since the contracts allow more room for maneuvering.

Then again, if guileful behavior takes place, then it will be equally difficult to stop it regardless of the firm's boundaries. For instance, if a project manager shirks responsibility and avoids doing any real work, it will be a problem whether that project manager works for the company directly or through a freelance project manager company (PM is clearly a specific

asset). All measurement of the amount and the quality of the work done will have to be done through proxies in any case.

However, there is a hidden benefit in outsourcing: risk reduction (in terms of going from a higher quadrant to a lower one). If a guileful person acts against the firm's best interest in a classic agent-principal manner then having that person on the firm's payroll can be disastrous. For instance, if a construction worker makes a mistake building a house, the seller of the house is not responsible when the roof comes down – as long as the seller's firm was not the employer of that worker. Likewise, the worker is not responsible if the materials were flawed. The point is: deeper vertical integration leads to higher-quadrant risks.

4.7 Frequency

Frequency refers to the buyer's activity in the market, and, as mentioned, ought to increase asset specificity through specialization, thus leading to lower levels of outsourcing. The activity, traditionally, is divided into two categories, occasional and recurrent.

Since asset specificity is the underlying reason for the inverse correlation between frequency and outsourcing, it is useful to refer to what was previously said about asset specificity. In particular, the underlying asset is to be questioned. For instance, large corporations barely pay any tax on their profits because their accounting is so highly specialized. Accounting, then, is no longer a support function, but a strategic function: because of diseconomies of scale, global firms that employ people in the tens and hundreds of thousands require such tax planning to remain viable. The problem, even then, is not necessarily the amount, but the fact that there quite simply is not such an asset that is required on the market.

But frequency does not always increase asset specificity. For instance, invoice entry is largely the same business whether there are 10 or 10000 invoices per month. Indeed, frequency enables to narrow down tasks, thus increasing the proportion of rule-based logic for some jobs, which in turn *decreases* asset specificity.

4.8 Summary

This chapter shows some possible, but real and clear violations of transaction cost economics. Indeed, the extremely linear and static nature of the TCE seems to completely miss the complex nature of the world.

What is even more concerning is that sometimes TCE does not make any sense in economic terms, either. That is, while for instance behavioral economics – largely started by Simon’s bounded rationality – challenges the *homo oeconomicus* logic in that humans are not Laplacian demons, it still *makes sense* economically: one takes shortcuts in decision making because that is *more economical*. So instead of understanding everything perfectly, people understand *enough* (or at least we think we do) to make a decision.

All in all, a broken watch is right twice a day. TCE is not a broken watch, but it does have a systematic error: it measures things that are not quite correct, but that have some endogeneity with what is. Quite a lot of endogeneity, in fact, since studies show that it is right in about one in two or three cases. Bottom line: asset specificity may cause integration, but integration may also cause asset specificity (which implies that outsourcing would remove asset specificity), and not only that, but they may also be caused by a third factor, such as the ones described by competence-based theories.

Finally, I do understand where TCE is coming from: the world was quite different 30 or more years ago, and the landmark in outsourcing, the deal between Eastman Kodak and IBM, had not been seen yet. Thus, it is not difficult to see that TCE would seem brilliant under those circumstances. However, the world has changed, and whether this means that TCE is proven wrong or that transaction costs (or asset specificity) have very nearly vanished, thus rendering the theory obsolete, understanding TCE is not very useful these days.

Personally, I believe that both of the reasons speculated have happened. First, TCE does not take all aspects into account, so it was always going to produce mixed results. Second, the amazing developments in the information and communications technology (e.g. internet and open source standards) have produced results few of us could have predicted. One of these results is that fewer things are now specific because so much more of the value addition is done through software (or through other, inexpensive ways): the manufacturing robot is easily reprogrammed, and visually creative people in the marketing department are being replaced by math geeks who are equally adept at quantitative trading. The specificity comes from designing the proper constellations, not from the assets themselves.

When one puts these two (partnerships and commoditization) together, the result is that the *important* asset is the ability to control the partnerships, but that is not so *specific* because mostly those who excel at relationship management can easily be moved into a different transaction without a huge loss of value.

5 Control & Creativity – implications of complexity

The purpose of this chapter is to present a theory of what to outsource that takes complexity into account, per the second research question. There are two factors that are important in terms of complexity: control and creativity. The first of these refers to the ability to force changes upon the organization, and the latter to the ability to try new things.

5.1 A particular task is to be accomplished

The heading is a direct quote (Williamson, 1985, p. 20, chapter *Transaction Cost Economics*, subchapter *Explication*, second sentence) and represents a very profound assumption that underlies the whole of transaction cost economics. The particular (or primary) task of any given organization is to survive. The rest is more or less unparticular. Survival, in turn, is ensured with effectiveness, which in most organizations' case is the ability to make money. I have thus far been able to identify two factors that affect survival: control and creativity. Creativity means potential for success, control to the ability to execute. Such dictionary-like definitions mean nothing as such so in this chapter those two ideas are explained in more detail.

5.2 What is control?

First, control is not micromanagement. Micromanagement leads to efficiency, but also to lock-ins, that is, micromanagement would be great if everything would be static, or even linear, that is, predictable.

Instead, control is the ability to adapt and evolve, to actively change things when necessary. If this type of control is lost, a cascading failure of the system which is the firm is not a question of *if* it will happen, but rather *when* it will happen. Thus, control is not about ex-ante making sure nothing negative will happen. It is making sure that if and eventually when something goes wrong somewhere, that is, the organization is no longer fit to the task (or more appropriately, the task to which the organization is fit is no longer a good survival strategy), the organization has the power to change things. This is perfectly shown by a recent HBR article (Reeves et al., 2015) in which the authors discuss under which circumstances a certain type of strategy should be chosen.

It should be noted that something goes wrong every day: an employee takes a sick day, a report takes a little longer to write – whatever that deviates from absolute perfection. Being in control means that there are mechanisms that enable the organization to adapt to these

deviations. Sometimes, the deviations can be large. For instance, a disruptive technology completely changes the earnings logic of the entire business. Here, being in control requires that the entire strategy and organization is changed quickly, as if in punctuated equilibrium.

For a small part, control is also about key control variables. This is where transaction cost economics might have a role to play if a bilateral monopoly does not exist. Key control variables are assets that if taken out of the equation, the firm will in all likelihood tip over into chaos, basically that they will have great difficulties to continue operations. But this is only relevant in cases where bilateral monopolies do not exist: if an asset is equally specific for both sides of a transaction, the hostage logic underlies the transaction regardless of ownership and contracting issues as game theory shows us. Note however that if there are bilateral monopolies and no threatening asymmetries of specificity, the firm is unlikely to be threatened by opportunism.

It must be pointed out that the ability to adapt, which is what control is, is inversely correlated with control variables. Think of a house of cards: if any card falls, the whole thing will be gone. Control is thus also negative feedback, and they are enabled through networks. A chain is only as strong as its weakest link, but a net is barely affected when one link fails. The skill is in balancing between chains and nets, because too tightly bound nets are completely indestructible; this means that the management loses the ability to control the organization. On the contrary, too loose coupling means there is not much value added (i.e. the modular nature of the business means that anyone can do the same product and thus margins are shaved paper-thin). Thus, strategizing is of the highest importance.

5.3 What is creativity?

Creativity is freedom. It is the freedom to play, to try new things, do things differently. Indeed, it is the very same thing that control is: agents, whether cellular automata, individual creatures, or employees, change themselves to create something new, and collectives, whether species or firms, may change themselves adopting the new ways of working if those new ways are better, and that may spread over industries.

Creativity on the organizational level then refers to two things. The first of them is the ability to create new products, and the second to creating and changing interconnections, or couplings, between tasks, between people, and between tasks and people. As pointed out, the particularity of things is difficult to point out. To produce a widget or a service, the organization

can take many shapes. Furthermore, changing something about the product can enable equal or greater fitness through different logics. This is what is commonly known as disruption.

Disruption (Christensen and Raynor, 2003) takes two shapes: low-market disruption and new-market disruption. Low-market disruption refers to a model where (a part of) the customers are satisfied with a lesser product when it comes with a significantly lesser price tag. This is due to the fact that consumers are not always willing to pay the premium for feature innovation because the innovations exceed their ability to use those features. On the other hand, the new-market disruption is the ability to bring the new product to customers whose other option is not buying the expensive model, but not buying anything at all.

Creativity, in those terms, can be seen equally as either producing novel products or producing novel ways to make non-novel products (but since the underlying logic is novel, the product is novel, too, although it would be designed to do the same thing as the other). For instance, electronic invoicing does nothing new as such, but the way in which it works enables massive cost savings as well as improved business intelligence. Or as cheaper airlines provide the same basic service as the more expensive ones, their novel business models leads to flight being used differently.

5.4 Interaction effects

Control is the ability to change things. Creativity is the ability to change things. But they are not the same thing: creativity is evolution, while control is revolution. Hillis (1990) showed how evolution took place between two species through a simulation. On a large scale, this reminded of the so-called punctuated equilibrium, a theoretical model of evolution where periods of stasis, that is, non-changing of survival strategies, are punctuated by rather rapid changes; the evolution seemingly leaps from one equilibrium to another.

However, what happened under the bonnet was that – using my terminology – creativity took place all the time, and when time was ripe, this creativity had produced new strategy that was superior to the old one, and quickly the strategy was spread out, as though by revolution. How was this possible? Because agents, that is, single parasites (or rather, Ramps), had autonomy. Without it, they could not have had changed

Control and creativity are thus non-competing, but complementary factors. Creativity is needed for evolution, but control is needed for autonomy, to make the required changes to the

large-scale survival strategy. The paradoxical state of concurrent boundedness and freedom is the source of fitness over periods of time.

5.5 Control and creativity in practice

5.5.1 Control

Control requires that companies remain autonomous, and this is the job of the board of directors. Technically speaking, the board of directors sometimes gives power (that is, outsources its own decision making) to the executives; in most cases (remembering that SMEs account for about 100% of all companies), though, the people in the board are the ones who execute these strategic *revolutions*. They are the ones (through the CEO) who punctuate the equilibrium when necessary.

A more important part of keeping in control is to make sure that the organization is managed in a manner that enables change. If the organization is extremely tightly coupled and the internal links are too tight, that is, if what Stacey (1996) calls shadow networks are too strong, then changing may be impossible and the company almost certainly faces implosion. I have no problem seeing how this can be applied to failures in mergers and acquisitions, or for instance the problems that the public sector is facing in many European countries. This is also an agency problem. Outsourcing is in fact extremely good for this because medium- or short-term contracts are more easily eliminated and replaced by alternative constellations than if they were integrated. This is to say: too much integration leads to a loss of control.

5.5.2 Creativity

Creativity, then again, requires room for maneuvering. This is the job of integrated employees. An integrated employee is more difficult, not easier, to control, but then again the employee is more in control, and can search for alternative fitness peaks, that is, novel strategies to do something.

Creativity, in essence, is thus decision making. The one who decides is the creator, not the controller. The controller's job is to actuate decisions. For instance, a product designer makes decisions regarding the product that he designs. If these decisions need to be based on rules, such as a certain results from market research, they are not decisions any more than the clerk's *decision* to charge the price on the label. It is extremely important to understand where the creativity is situated, and sometimes it is also quite difficult.

Not all creativity needs to be integrated, though. That would lead to integration cascades. Just the creativity that the firm wants to make money on. The said market research is a good example. The production company outsources market research because it does not intend to make money with it – just with the results. The market research company, then again, might outsource the call center responsible for the interviews because it does not intend to make money on that, the creativity for it lies within the art of questionnaire design, numerical analysis, and presentation of findings.

5.5.3 How to be creative and in control

Both control and creativity are fairly easily attained. Control can be achieved by either keeping ownership in-house, that is, keeping most of the ownership of the firm with the entrepreneur, or by having a large enough owner base, like publicly traded stock companies. The danger zone lies with venture capitalists (or other special cases, such as governmental ownership) who are interested only in developing the firm (or perhaps just one patent or trademark that the firm holds) so that someone wants to buy it off. Clearly, there are two benefits from VC money: the ability to develop the firm *at least* to the point of *exit*, and in many cases the entrepreneur, too, stands to make a huge sum of money from that. So it is not to say that VC money is somehow evil, just that it is not interested about paying for someone to be able to work on a darling mission for the rest of his life.

Control thus takes two forms: in the JSCs, control is self-organization in a species-like manner: the species develops to account for the changes in the environment through small changes made by the employees, individual members of the species. In the entrepreneur-held companies, control is more like in individuals who can try new things, some of which have better and others worse consequences. This also helps explaining why big and small firms are better at different things.

Creativity can be achieved through excess and redundancy. This means that there must be enough time to develop things, whether they are new products or new ways of working. TCE in some way refers to this by the concept of behavioral uncertainty: it will be difficult to measure the work these people do since their output is ambiguous. However, the output of, say, complicated (and even complex) analytics is also ambiguous, meaning it is impossible to measure how good the analysis is, but this can be outsourced because it is not necessarily creative. The aim of that job is to produce solid analysis, but solid analysis is not creative, but

based on rules and judgment. (And it is also important to remember that an analyst's production is also ambiguous within organizations.)

This market analysis can be used for, say, new-product development or organizational changes, but the creative part is not in doing the analysis, but making use of it. In turn, the creativity for analysis is located in how the analysis is done. If the firm wishes that then obviously they will need to integrate the mathematicians, statisticians, developers, data and system architects, and so on. This helps explain why outsourcing is so popular: specialists can create wonderful, modular products that can be customized to many uses with relatively small effort, possibly using other specialists that take the previous specialists' product. The connection to IT in previous is obvious, but it could have easily been the auto industry, kitchen furniture, or translator services. As long as the interfaces between the systems work, it is of little consequence whether those interfaces are between firms or business units.

5.6 Implications from the control and creativity theory

The aforementioned means that control and creativity can be attained and held on to using an almost infinite number of different organizational constellations. Because of this, there is in fact very little that cannot be outsourced and indeed, almost everything can be outsourced. There are three things which direct the outsourcing decision.

First, value addition. Value is added by the process which takes inputs and transforms them into outputs. The firm can only make money through these processes, nothing else. So, if the firm is able and willing to do these processes, they should not be outsourced. If they are outsourced, someone else makes the money on those processes, and the firm must find alternative processes with which to make money.

Second, there needs to be someone that will take care of the process. That is, there needs to be market supply for those outputs that the firm wishes to buy. If there is not, it is obviously impossible to outsource. Furthermore, the more standard the service, the better. If the service is completely standard, it will also be very cheap in comparison to a completely idiosyncratic process. In turn, if it will have to be tailored from scratch, the cost savings will likely be insignificant.

Third, the firm must be able to use the outsourcing. This requires that the firm has the technical and the organizational interfaces that are necessary links between the company and its supplier. In practice, this means that if the firm is using an idiosyncratic system the

outsourcing could be either disruptive or very costly. Of course, if the firm uses something non-standard they should think very hard if it is good for them or not. In the future, it will cost the firm a lot to train people non-standard skills, and the so-called best practices are called best because they usually are just that. Continuing to do something instead of changing comes at an opportunity cost.

Because all of these requirements are quite simple, the difficulty lies somewhere else. I hypothesize that that somewhere is in managing the outsourcing properly. Outsourcing is obviously at first a project, so successful management of that project ensures continuity of operations as well as averts costly traps.

In the long run, meaningful management of the relationship between the contractor and the supplier is required so that the relationship itself remains meaningful for both. Indeed, secrecy, hard bargaining and such tend to lead to the loss of benefits of the relationship for not just one, but both sides. Thus, openness and mutual trust are required so that both parties will benefit in the long run. This is true even in the case that will lead to the termination of the contract since opportunistic behavior in that situation will in the long run lead to a loss of reputation which can lead to going out of business completely.

On a final note, control and creativity are not competing forces, but rather complementary ones, as pointed out before. This means that companies will do well to strike a balance between the two. It is similar as debt and cash. Companies that have a lot of debt run the risk of financial distress and even bankruptcy. However, those that are sitting on piles of cash are inefficient.

Similarly, too much control means leads to lock-ins which may produce excellent results in the short run, but the company might find itself being overtaken by novel approaches. In turn, plenty of creativity might produce wildly innovative ideas, but fail to deliver in the short run. This then leads to failure to reach the long run as the company does not have the sufficient revenue to keep going. Outsourcing and integration, then, should be mixed properly.

6 Discussion and conclusions

In this chapter, the implications of the findings are discussed. First, the research questions will be reviewed. Second, the two parts, TCE and complexity, are discussed on their own, and the main conclusions are drawn. Finally, there are some recommendations for future research and limitations of this study.

6.1 Research questions

Here we will see how the study has answered the original research questions. There was clearly more success with the first question than the second one, but both questions were answered in satisfying detail.

1. Why transaction cost economics fails when determining sourcing when the complexity of organizations and economies is taken into account?

Drawing from studies as well as a wide variety of theory, I believe it was clearly shown that transaction cost economics cannot determine between outsourcing and integration. The clearest point against transaction cost economics is that opportunism is often an extremely poor long-term strategy, and thus very few firms would behave opportunistically even if they could.

Furthermore, even if some firms would in the long term end up behaving opportunistically, the costs of opportunism hardly ever lead to higher total costs when the savings are taken into account. Finally, even the basic idea of transaction costs as friction must be questioned: higher production costs make it hard to sell a product profitably. Thus, production costs should be seen as a force that resists motion.

Finally, TCE can be used to help understand some parts of contracting, but it is not something students should pay much attention to in the large scale. Also, the future is looking bleak for TCE as things like open source systems and increasing standardization are likely to further lower the transaction costs across the board.

2. What kind of a theory or framework could better handle the complexities where TCE fails?

The theory described in chapter five can handle the complexities (at least better than TCE can), but the problem is that it is difficult to use because it requires so much experience and expertise. Obviously, it is wiser to take a sketchy map of the right area and tread carefully rather than to

take a detailed map of a wrong area and walk right off a cliff. In this case it could be wiser to hone the skills regarding adaptation.

So, while the theory described answers the question what can we should outsource (or rather, what we should consider outsourcing), the main finding was that we should rather try to improve our ability to nurture and manage the relationships with our partners than to focus on conspiracy theories and preparing for war. It is said, *si vis pacem, para bellum*, or that if you wish peace, prepare for war. Instead, as we see, peace is best acquired by making yourself important. After all, it is also said that the dog does not bite the hand that feeds it.

6.2 Implications from the study of TCE

It was found that transaction cost economics is violated everywhere when it is used to study outsourcing. That is, not even one of the constructs of the TCE holds in every occasion, and even the transaction costs themselves are extremely ambiguous. Furthermore, the studies show that TCE in outsourcing is not very widely supported whether that is because of the shortcomings of managers and academics, or because of the shortcomings of the theory.

Because of the aforementioned issues, I posit that the TCE should not be used to prescribe what should be outsourced. In other words, I feel that studying outsourcing along the lines of the usual outsourcing-in-the-light-of-TCE studies should not take place. Since study after study shows similar results it can quite safely be said that it is very unlikely that suddenly everything would change. As is sometimes said, insanity is doing the same thing over and over again, expecting different results. The whole body of evidence, seen in the meta-studies, is probably strong enough.

However, I do not wish to say that transaction cost economics cannot give any insights as to whether and especially how something should be outsourced. The idea of friction (or rather, that the transaction meddles with the desired outcome and the outcome for agency/game theoretical reasons) in economic systems is important, but instead of viewing TCE as the all-encompassing super-theory, it can be used to give some insights. For instance, almost all outsourcing contracts should probably take bilateral forms (as they do).

That said, I cannot possibly agree with Williamson's (1991, p. 76) views that strategizing should be secondary to economizing. Instead, the two are irreplaceable and interconnected parts of the outsourcing process and phenomenon. Also, TCE puts far too much emphasis on opportunism, not to mention other flaws in the theory discussed in chapter four.

Much more emphasis should be put on the limits of rationality, because we all know that prediction can be very difficult, especially when it is about the future.

Speaking of future, it is looking quite bleak for transaction cost economizing. As complexity of product offering increases and the boundaries of products are becoming more vague (e.g. Porter and Heppelmann, 2014), it is becoming increasingly difficult for firms to make everything that would be considered specific in-house. Thus, it is becoming ever more important to manage partnerships and alliances rather than just economize.

6.3 Implications from the study of complexity and the new theory

Before I started to write this thesis, the advisor told me that years ago complexity was all the hype, but the hype largely died because it cannot be used to explain anything. While I am somewhat more positive about the study of complex systems (see for instance how Bylund (2015) disproves Coasean TCE using complex system study methods), the chapter five of this thesis gives a good case in point for the less enthusiastic view. That is, if one asks the question: "What does your theory say I should outsource?" I do have to admit – grudgingly – that the best answer will be: "It depends.", or more precisely: "You *only* need to understand microeconomics, available technology and solutions, systems theory, process development, project management, and last, but definitely not least your own business and product from every angle, including that of the users', so that you can answer that yourself."

While there are some reasonable guidelines as to what you should most likely outsource (such as non-specific support functions, for instance most firms do not need to build their own office laptops), and some others that you should think very, very carefully about before outsourcing (such as specific core competences, like many parts of product development), those mentioned in the previous paragraph are the only possible *correct* answers. Because of this, I don't think that any theoretical model such as TCE, RBV, or core competencies can really prescribe automatically what should or should not be outsourced, and even when they do, the theories provide answers that can often be seen as tautologies or truisms and thus useless. Simply put, no existing or future theory will be able to answer all the difficult questions for every kind of business in all possible situations – at least not if you want clear and simple answers, such as *support functions* or *non-specific assets*.

6.4 The importance of management

Because of the difficulty of answering the *what* question, emphasis should be put on the *how* side. Let us call that *management*. Outsourcing is of course both a project and a continuous effort, thus requiring capabilities in both kinds of management – however, in both cases cooperation with stakeholders is extremely important. These efforts are likely to be far more important than what is being traded.

Williamson himself (1985, pp. 120-123) has noted the exceptional capability of the Japanese auto industry to spin webs of interdependent firms. When each party tries to make the counterparty happy in a reasonable way it will benefit the whole network. Only when some nodes in the network see that their time is out, for instance because the landscape has changed, can they resort to opportunism. But this opportunism will also lead into deeper lock-ins, that is, the opportunist will become even further dependent on the contract which, needless to say, will not be renewed on opportunistic terms. The markets are extremely powerful in that sense.

Thus, a better strategy than opportunism is adaptation, because it is the *only* possible strategy. Hard bargaining tends to lead to poor relationships and leave value on the table, as Fisher and Ury (2012) point out. That then again leads to the conclusion that in the long run a network that both saves on production costs and does not fall prey to warring behavior will emerge victorious over those that focus on squabbling over crumbs falling off the table.

6.5 Recommendations for future research

As pointed out, outsourcing should not be studied en masse with questionnaires using the transaction cost economic predictors of asset specificity, (behavioral and environmental) uncertainty, and frequency. Instead, deeper case studies of outsourcing (especially about failures thereof) should be done, and it would be interesting to see speculations whether transaction cost economics could have helped in formulating a better contract or recommend integration, and how that could have affected the situation.

However, I do feel that instead of these estimations, a better line of enquiry would be to assess the process of outsourcing and developing on that. For instance, both my "new theory" as well as the earlier theories such as TCE or RBV have a touch of tautology in them, and so it seems that it might be impossible to in fact explicitly dictate what should and what should not be outsourced. It seems that on the grand scale outsourcing is an unstoppable force, and to

paraphrase Williamson (1991, p. 76), students should rather learn how to outsource than what to outsource.

If, however, one wants to follow along these lines, it could be possible to update transaction cost economics into something that considers complexity. Indeed, not much needs to be changed: instead of either TCE or complexity, consider interaction effects with strategy as well as magnitudes. For instance, if demand is extremely price elastic and there are winner-take-all dynamics, small production cost savings can be important far beyond any scares of opportunism, at least in the first place. On the other hand, assume that demand is not extremely price elastic and outsourcing can only produce first magnitude savings. Assume also that uncertainty potentially leads to losing every penny the firm has ever made. In this case integration would of course be an important idea.

Such a model would of course be much more difficult to both create and use, and I feel that it would be counterproductive to sacrifice scarce research resources into making a difficult model that orders to consider many, many criteria. Also, there is always the danger of over-fitting, and anyway the model would suffer from a linear nature.

Finally, practitioners are the best researchers. The firms pay with their earnings and the employees with their careers, but nowhere in job listings have I seen any wishes about understanding the TCE theory (or any other such theory, for that matter, but thoroughness, analytic mindset, and understanding the big picture are standard requirements). And every single job in the field stresses applicants to be customer oriented team players that are quick to learn. Those attributes are very desirable in organizational terms, also.

6.6 Limitations of the study

The study, as pointed out, has two parts, each of which has their own limitations. The first part, regarding the failure of TCE, only has one significant limitation: it is studying TCE only in the realm of outsourcing. However, TCE can be (and has been) used in very many ways, and this thesis does not even attempt at discussing all of them. However, many concepts and arguments discussed at the criticism part can be applied to other uses as well – but some cannot. In the future, applicability of TCE in other areas could be evaluated; it could be that TCE is very good in other areas, but not quite so in outsourcing.

The second part, the attempt to create a complex model of outsourcing, has two limitations. First, it is obviously only generating a hypothesis which is not tested. This is clearly

a major limitation, and I am struggling to operationalize the theory in order to study it. Second, complexity science is quite adept at describing events, but not quite so at prescribing courses of action. The point is: maybe the reader now understands some dynamics, but cannot still know the best course of action. But that is how the world really is: complex, difficult, uncertain.

6.7 The findings in a nutshell

I wish to end the thesis by wrapping up in very simple terms the findings of this study. They can be divided in three. First, TCE is not a good theory when one considers what to outsource. This is proven by earlier studies and dictated by logic. Second, and as a result of the first finding, there must be a better theory that can take into account the complexity of economies and firms, and such a theory was identified (or rather, outlined). Third, because using such theory is extremely difficult (especially operationalizing it into mass studies should be very hard), we should rather forget about *the what* and let those decisions happen on an ad hoc basis, and instead focus on *the how*. In all likelihood, that is all we can speak of.

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