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Abstract

The purpose of the study was to explore how a public, IT services transferor, organization, comprised of autonomous entities, can effectively develop and organize its data center cost recovery mechanisms in a fair manner. The lack of a well-defined model for charges and a cost recovery scheme could cause various problems. For example one entity may be subsidizing the costs of another entity(s).

Transfer pricing is in the best interest of each autonomous entity in a CCA. While transfer pricing plays a pivotal role in the price settings of services and intangible assets, TCE focuses on the arrangement at the boundary between entities. TCE is concerned with the costs, autonomy, and cooperation issues of an organization. The theory is concern with the factors that influence intra-firm transaction costs and attempting to manifest the problems involved in the determination of the charges or prices of the transactions.

This study was carried out, as a single case study, in a public organization. The organization intended to transfer the IT services of its own affiliated public entities and was in the process of establishing a municipal-joint data center. Nine semi-structured interviews, including two pilot interviews, were conducted with the experts and managers of the case company and its affiliating entities. The purpose of these interviews was to explore the charging and pricing issues of the intra-firm transactions. In order to process and summarize the findings, this study employed qualitative techniques with the multiple methods of data collection.

The study, by reviewing the TCE theory and a sample of transfer pricing literature, created an IT services pricing framework as a conceptual tool for illustrating the structure of transferring costs. Antecedents and consequences of the transfer price based on TCE were developed. An explanatory fair charging model was eventually developed and suggested.

The findings of the study suggested that the Chargeback system was inappropriate scheme for an organization with affiliated autonomous entities. The main contribution of the study was the application of TP methodologies in the public sphere with no tax issues consideration.

Key words	fair IS services charging; TCE; Transfer pricing; charging and pricing schemes
Further information	



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DEVELOPMENT OF A FAIR CHARGING MODEL FOR A PUBLIC DATA CENTER

Case: Kuntien Tiera Oy, Turku

Master's Thesis
in Information Systems Science

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ABBREVIATIONS AND ACKNOWLEDGEMENT

Abbreviations

IS	Information System
ICT	Information and Communication Technology
SLA	Service Level Agreement
TCE	Transaction Cost Economics
TC	Transaction Costs
TP	Transfer pricing
CCA	Cost Contribution Arrangement
ENTITY	Autonomous Municipal, an autonomous division, A Business Partner
MNE	Multinational Enterprise
PPP	Public Private Partnership
TPP	Traditional Public Partnership

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1 INTRODUCTION

1.1 Data center IS costs

A public data center should recover its Information Systems (IS henceforth) costs, just as a private data center does. Different methods or mechanisms of cost recovery are used for this purpose (Paradi et al. 1995). The determination of a data center services costs is contingent on whether the service in question is produced either by a general purpose technology or by a special purpose technology. However, a service could also be produced from a combination of both technologies. Nevertheless, cost assessment of a service produced from a composition of both general and special purpose technologies make the pricing and charging of the service more arduous. Moreover, a fair pricing and charging would require continuous price assessments. Accordingly, Williamson (1985, 139) pointed out that, even a slight degree of technology specificity (i.e., asset specificity) makes the pricing, and periodically resetting of the price, problematic. Basically, the costs of two technologies in question are determined in terms of their value realization, this is a reason for further pricing complications.

Cost is a fundamental base for a data center service price (Paradi et al. 1995). Hence, assessing the price of the service is facilitated by making the cost of a data center the basic unit of analysis. Therefore, an efficient cost-determination method or mechanism is vital to a public data center. The underlying costs that a data center should recover are costs such as costs of equipment, premises, staff expenses and costs incurred for example from use of real estate assets, computers, and communications networks (Paradi et al. 1995). In addition, there are transaction costs (not the actual service or product costs) that are incurred from inter-, and intra-firm activities for example negotiating, and monitoring costs (Brown and Potoski 2005). Furthermore, there are costs that are highly specific to a transaction (Williamson 1983). Generally, these costs can be recovered for instance by using different methods and in the form of fixed costs, variable costs and marginal costs.

To recover expenses from its entities (i.e., municipalities in this case) through a fair and non-profit scheme, a public data center need to make commitment and maintain a progressive business role (Paradi et al. 1995). Moreover, Paradi et al. (1995) emphasized managing an IS department of an organization (certainly, a public data center has the same role) as if it were in an open market. Therefore, it is necessary for managers of a public data center to explore the present-day intangible assets of open markets and their service pricing concepts and models. Essentially, setting the price for services of a data center is the initiation of costs recovering. Thus, apparently an applicable Transfer

pricing (TP) method will ensure evenness (Laine 2012, 2) in the pricing transactions of intangible assets among entities.

1.2 The role of charging or pricing model among associated entities

Developing or adopting cost-effective pricing and/or charging models should be the cornerstone of every data center in order to ensure, enhance and strengthen the quality and price competitiveness of their services. The pricing of Information Systems services have indisputably been of the concern for some time. Accordingly, Paradi et al. (1995) stated that “the economics of computer-based services became a strategic concern”. Moreover, the data centers’ role in modern ICT infrastructures has become crucial for enterprises (Heini 2011, 1). These centers are an essential alternative for delivering ICT services and providing ICT resources to a number of organizations on a shared ICT infrastructure. Furthermore, data centers and virtualized computing environments are a major factor in shifting resources and software applications usage into subscription fee and/or pay-per-usage (variable fee pricing) bases. Despite having more flexibility compared to traditional models (Samimi and Patel 2011), data centers service pricing is influenced by transaction related factors (e.g., assets specificity, volume, contract duration, transaction frequency, and opportunistic behavior) which add to the models complexity. Moreover, Yumei and Yang (2011) point out the inadequacy of research on the pricing processes of the modern pricing models.

A data center infrastructure requires huge investments. Thus, for a single public entity (i.e., a municipality) it is simply not practical (a reason can be the fast pace of technological changes) to consider investing in such infrastructures. Therefore, private sectors invest (considering economic scale in mind) in these infrastructures and the public entities become their customers. However, when the government is the only customer of a data center, the first provider (i.e., the winning bidder) obtains a monopolistic or quasi-monopolistic position. Nevertheless, some government organizations take great precautions to safeguard against future exploitation by having shares (to have influence over the decision making process) in the provider organization of a data center. Certainly, for some very critical situations (e.g., national security, public health) governments establish their own data centers.

Similarly, some public entities together invest in the infrastructure and establish a data center to minimize resource consumption and obtain good quality of services at a competitive cost. Notwithstanding of combined investment, the entities want to preserve their autonomy. Basically, the data center must maintain a progressive business role within the value chain and must thus recover its own expenses through a non-profit and fair pricing scheme. Hence, every entity must ensure that the transaction costs (e.g., the

costs of negotiating, managing, monitoring resources and performance) does not rise above the production costs (if the entity was to produce it by itself). Price discrimination will arise when some entities bear more costs than others. Price discrimination will prevent some entities from joining the combine and disappoint already joined entities.

1.3 Transaction costs and Transaction Cost Economics

Transaction costs are management costs that incur as a result of services delivery from inter-, and intra-firm activities (Brown and Potoski, 2005). Moreover, it is crucial to understand that transaction costs are not production costs, actual service costs or exchange costs. Williamson (1985, 18) certainly considered the transaction cost definition by Kenneth Arrow: “costs of running the economic systems” for distinguishing purpose. Transaction costs in this context refer to costs of establishing a partnership (Schepper et al. 2015), unifying (municipalities), maintaining partnership and unification of associated municipalities. However, this research will mainly be considering transaction costs incurring in the procurement phase since the project is currently on its procurement phase. Likewise, more specifically; Dudkin and Vällilä (2005) point out that transaction costs encompass legal, financial, and technical advisory costs incurred in the procurement and operational phases of services delivery; by both parties involved in a bilateral agreement. Furthermore, Dudkin and Vällilä (2005) hasten to state that costs of negotiating the contract; costs of organizing and participating in the bidding process; costs of the partner monitoring (e.g., to enforce compliance with the contract); and cost of renegotiating the contract would also be included among the transaction costs. In addition to the prior mentioned costs, costs such as head office charges, rental fees or royalties paid to an associated enterprise have also been considered to be among the costs that comprise the transaction costs (OECD 2010, 91).

Transaction Cost Economy (TCE) is an economic theory that, like any other economic theories, has a tendency to advise firms as regards better resources utilization and effective cost reductions whenever possible (Bon and Hughes 2009). Moreover, it is a framework (Cecchini et al. 2013) that focuses on transaction costs generated from the relationship, inter-, and intra-firm coordination (Frauendorf 2006, 53) and cooperation (Mark et al. 2013) among entities (i.e., the service provider, and the customers). TCE not only focuses on transaction costs but also tries to mitigate the risks “associated with transaction costs through cooperation among entities” (Mark et al. 2013). Furthermore, Frauendorf (2006, 53) argues that, since the coordination costs pertain to inter- and intra-firm activities; consequently the transactional cost will impact both the service provider and the customers as well. Thus, transaction cost theory can be considered as the basic or fundamental theoretical framework for analyzing the potential increases in the

transaction costs (e.g., costs of negotiating, defining, monitoring resource and supplier's performance) between services provider and the customer processes.

Transaction Cost Economics (TCE) theory would predictably assist the public entities with risks (associated with the combine and coordination between entities) mitigation and costs management. TCE regards the trade-off between the benefits and costs of autonomy and cooperation as its main concern (Dick 2005). In addition, TCE can be considered as the fundamental theoretical framework for analyzing the potential increases in the transaction costs (e.g., costs incur because of negotiating, monitoring resource and renegotiating). Furthermore, TCE will help in analysis (Williamson 1985, 3) and governance structure of the transactions.

1.4 Transfer pricing and OECD transfer pricing guidelines

Various transfer pricing definitions, with slight differences, transfer pricing definitions could be found; cf. definitions in the academic literature. In general, transfer pricing means the intra-firm pricing or pricing arrangement (Holtzman and Nagel 2014) of the transactions between associated entities. In this research transfer pricing means the intra-firm pricing of the transactions of intangible assets between associated entities. According to OECD (Organization for Economic Cooperation and Development) guidelines (2010, 19) transfer prices are significant for associated enterprises in different tax jurisdictions.

The *OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations* are generally accepted and transfer pricing guidelines are followed by all the OECD member countries. In addition, these Guidelines are mainly intended to multinational enterprises (MNE henceforth) and tax administrations. However, *OECD guidelines also promote the OECD member countries to adopt or obey these Guidelines in their domestic transfer pricing practices* (OECD 2010, 20).

OECD guidelines are an international taxation principle; the primary objective of these guidelines is to secure appropriate taxation in each jurisdiction and avoid the double taxation of multi-national enterprises (MNEs) (OECD 2010, 18) since MNEs have income from different tax jurisdictions. In addition, the guidelines will also ensure that taxable profits of MNEs are not intentionally shifted out of their jurisdiction to a low tax jurisdiction. Furthermore, these guidelines are intended to transactions involving all types of assets (Laine 2012, 3). The Arm's length is a common principle of transfer pricing and a standard basis to determine transfer prices for tax purposes (OECD 2010, 18).

Transfer pricing is mainly concerns with tax problems and it is an essential principle for international taxation issues. However, this research intention is not to focus on

taxation. Therefore, taxation issues (domestic and international) will not be considered in this research. Accordingly, it is believed that the distortion of financial conditions of associated entities has not only been related to the tax considerations factors (OECD 2010, 18).

The arm's length principle manifests the "how-to" of pricing transactions between associated entities. In addition, in the OECD guidelines (2010, Chapter VI) a particular attention has been turned to intangible property transactions. Furthermore, in Chapter VII of these guidelines intra-group services (i.e., exchange or delivery of services between related entities) has been given special consideration in order to establish arm's length pricing for those intra-group services.

Generally, transfer pricing (TP) is concern with the fairness in the setting of the price or charges for the transactions involving intangible property and services between associated business entities. Moreover, TP is intended to depict approaches to the intra-firm optimal cost allocation among entities.

1.5 A brief introduction to the case

Finland's municipal structure is undergoing continuous change due to the commitment of municipalities to engage in various administrative, organizational or service-based reforms. The goal of municipal reforms is to create strong and viable municipalities all over Finland by merging municipalities. Municipalities' ICT services and their organization reform are subsumed into these reforms. (Galkin et al. 2015)

As a part of the reforms Turun seutukunta (i.e., Turku region) municipalities in collaboration with Kuntien Tiera Oy intend to produce ICT service on the basis of various models (see Galkin et al. 2015, page 24). In addition to that, skills deficiencies, lack of financial and human resources are among the reasons for the collaboration in ICT service production. Furthermore, due to the fast pace of inventions and/or technological changes, most of the municipalities in Turku seutukunta, evidently, consider their, in use, technologies outdated and a reason for being in a state of remaining behind. Therefore, (currently) some of the municipalities in Turun seutukunta have made a commitment to establish a municipal-joint public data center.

1.6 Purpose and research questions

This thesis has been conducted for Kuntien Tiera Oy, infrastructure and support services team, and for the municipalities of Turun Seutukunta (i.e., Turku region). Tiera is a municipal actors-owned corporation. Since its inception as a joint-development platform

and cooperation forum, Tiera's intention has been to develop the municipal sector ICT services in a cooperation network with municipalities.

This case study seeks to gather information on how a combined data center of autonomy entities can organize, manage, and improve its pricing and charging of ICT services. Indisputably, the purpose and the outcome are not considered alternatives but complementary goals in this study. Hence, the primary aims of this study are: to investigate current conceptual pricing and charging models by means of literature review, collecting primary data by the semi-structured interviews, as well as to ascertain a fair pricing model for a public data center. Eventually, this research intends to provide suggestions for practical activities that will serve as an enrichment to the managers of the case company. However, the intention here will also be in keeping the results as general as possible to make the result usable in other relevant environments as well. The central question in this thesis is:

- What is a fair charging model for a public data center?

The approach this study is adopting for achieving its goal is to look at it through the lens of Transaction Cost Economics (TCE) and Transfer pricing (TP). For the simple reason of both TCE and TP are being broad ideologies, thus aims at narrowing this study's scope down. Consequently, it initiates the following two questions:

- What is the role of Transfer pricing in the fairness of pricing services of a public data center?
- What is the role of transaction-specific attributes (i.e., asset specificity, uncertainty and transaction frequency) in pricing services of a public data center?

To attain the set objectives of this thesis, an exploration of the current and suitable ICT service pricing concepts from the literature is considered essential in that a pattern in these concepts might be discerned. Hence, the scope for this study is to take a deep and comprehensive look at the current pricing principles in the literature. To relate the review of the literature to the research question and the case, each the suitability and/or the implications of each construct or pricing/charging method is commented. However, a full discussion of IT service pricing concepts lies beyond the scope of this study. Due to the time and resource constraints the deployment of the model will not be conducted as a part of this thesis.

1.7 Expository

Data center refers to huge computer systems and associated components in a facility for provision of ICT services, data communications connections across a network for instance. In this case research, it is a joint facility concluded by the associated entities (i.e., the municipalities in Turku area) for the simple reason of economic and efficient

information systems provision with good quality of services to each and every associated member.

Controlled Transaction is a service transferred across a technologically separable interface between associated or dependent entities (OECD guidelines 2010, 25). According to OECD guidelines (2010, 25) enterprises are associated if one entity participate directly or indirectly in the management or control of the other entity for example which diverge the commercial or financial relations from those which would be made between independent enterprises.

Uncontrolled transactions are transactions between enterprises that are not associated or dependent enterprises (OECD guidelines 2010, 30). Essentially, from the prior paragraph the description of independent enterprises can be derived as; enterprises that do not directly or indirectly have influence on (e.g., management, control) each other.

“*A comparable uncontrolled transaction*¹ is a transaction between two independent parties that is comparable to the controlled transaction under examination”. Clearly, the existence of a comparable uncontrolled transaction is at the core of applying Transfer Price (TP) methods. It is “internal comparable” if transaction comparison is between one associated entity and an independent party, whereas if the comparison is between two independent entities it is called an “external comparable”. (OECD guidelines 2010, 25, 115)

1.8 Research Outline

The overall structure of the study takes the form of six chapters, including this introductory chapter. The remaining part of this research paper proceeds as follows: Chapter two explores the theoretical background relevant to this research and ends with a summary of refereed literature. Chapter three is concerned with the methodology used for this study. Chapter four introduces the case company; present its current status, pricing structure and future needs. Chapter five analyses the results of findings, interviews, and the implication of case company (current) charging scheme, propose a framework and suggest an illustrative fair charging model for the case. Finally, Chapter six concludes the study by discussing the findings, giving a brief summary and critique of the findings, and giving suggestions for further research.

¹ The emphasis is from the author of this paper

2 LITERATURE REVIEW

2.1 Transaction Cost Economics (TCE)

A transaction occurs when “a good or service is transferred across a technologically separable interface” (Williamson 1996, 379). Transaction from a technological perspective is a sequence of actions that is to be executed as a unit in a database. Transaction from the service provider perspective is every activity that integrates a customer’s business process by obtaining access to external resources (i.e., provider’s resources) (Frauendorf 2006, 53, according to Williamson 1975; 1985 and Coase 1937).

According to TCE there are rational economic reasons for organizing transactions in different ways. Since, the predictive theory of an economic organization requires identification and explication of the factors that are responsible for the differences among the transactions, therefore, TCE considered identifying and explicating of the factors. TCE has identified *asset specificity*, *uncertainty*, and *frequency* as the principal dimensions, which cause differences in transactions. The previously mentioned three transaction-specific attributes are the determinants of the transaction costs. Nonetheless, Williamson believes that measurement of none (i.e., asset specificity, uncertainty, and frequency) is an easy task. Williamson (1985, 52, 391)

When crossed over from private sphere to public sphere, Williamson extended the transaction specific attributes with a further key attribute entitled ‘probity’. With ‘probity’ Williamson refers to loyalty and rectitude. In addition, he pointed out that probity is delivered through governance characteristic of leadership and management. Furthermore, in a counter-argument (probity is important in public and private transactions alike) Williamson speculates that probity can easily be seen or understood only in extreme situations. Williamson (1999)

2.1.1 *Asset Specificity*

The defined condition of asset specificity in a bilateral agreement is considered a crucial aspect for construing and defining transactions (Williamson 1985, 30). Asset specificity from a TCE perspective refers to the assignability and/or transferability of assets (Grover and Malhotra 2003) in order to execute and support a sequence of actions (i.e., transaction) of a specific customer(s). It needs specialized investments in assets (e.g., physical, human) specificity (e.g., location, capacity) in a particular bilateral agreement. However, these highly specialized, relation-specific and/or asset-specific costs may or may not have any value outside of the specific bilateral trade or relationship (Grover

and Malhotra 2003). Nevertheless, asset specificity has a deep correlation with the discreteness of a service provider in this context for example. In addition, it may and can (at least for a short period if not for ever) cause the market to be uncompetitive (Brown and Potoski 2005) for the service provider. However, from the customer perspective asset specificity can be a bifurcated or tow-sided situation. On the one hand customer requirement is fulfilled, but on the other hand asset specificity is likely to reduce the number of vendors (Brown and Potoski, 2005) in the market. Furthermore, Brown and Potoski (2005) argue that the situation will be exacerbated if the government is the only customer of the service(s).

Williamson (1985, 54) divided assets into two types according to the degree of their specificity, that is, wholly specific, and nonspecific assets. However, Williamson (1985, 54) pointed out that by two types this does not mean that a mixed type (i.e. a combination of both wholly specific and nonspecific assets) does not exist. Notwithstanding the specificity degree of the assets, it is crucial how the accountants regard the cost of assets as fixed or as variable costs (Williamson 1985, 54). Furthermore, considering the assets cost, as a fixed or variable cost, affects how an organization deploys its assets. According to Williamson (1985, 54) regarding costs as fixed or as variable depends on whether the asset is deployable for alternative uses and/or users (Dick 2005) or not. Hence, if an asset which dedicated to a specific transaction (Dick 2005) is re-deployable (without reducing upon agreed quality of a service in a specific reciprocal agreement (Dick 2005)) the costs should be considered as variable costs; otherwise the costs should be considered as fixed costs. However, Williamson (1985, 54) argued that many assets are often perceived by the accountants as fixed while they are re-deployable. Apparently the reason behind this could be mere simplicity and ease. A good example of a re-deployable asset is a general purpose vehicle (Williamson 1985, 54).

Pre-investment in technology is essential for a service provider (i.e., data center) in order to increase the probability of being selected (Gordon and Poppo 1991) by the service buyer (i.e., customer). Two types of investment in technology are described by Williamson (1983). One is investment in a general purpose technology; the second is transaction specific technology investment, which requires a higher investment (Williamson 1983). However, the cost of transaction specific technology can be reduced if this technology has an alternative use or has an alternative user (Williamson 1983). Nevertheless, this pre-investment may become somewhat of a reason for conflict (Williamson 1983, Gordon and Poppo, 1991) in the reciprocal agreement and thus exacerbate the relationship between service provider and service buyer (not a provider within a multidivisional corporation (Gordon and Poppo 1991)). Therefore, the “outside” service provider has to sacrifice a part of this pre-investment. Similarly, Williamson (1983) described this sacrifice as credible commitments. Basically, there are some irrecoverable costs in the technology pre-investment (Williamson, 1983, Gordon and Poppo,

1991) as a result of a provider credible commitment. Hence, the sacrifice is for the manifestation of the commitment to the service buyer (Gordon and Poppo, 1991) and for safeguarding (Williamson, 1983) the reciprocal agreement between a service provider and service buyer. Furthermore, Gordon and Poppo (1991) consider the commitment as an essential action for the service provider in the selection process. However, they also argue that the portion of an irrecoverable pre-investment will be small if the pre-investment was made for other reason than increasing the chance of being selected.

The effect of asset specificity on transaction costs (e.g., does asset specificity increase the transaction cost?) is indisputably crucial in the context of this research. Thus, beside other papers Gordon and Poppo's (1991) research merits close consideration for this purpose. In their research of service provider relationships (i.e., multidivisional corporation supplier and the outside supplier) and transaction costs Gordon and Poppo (1991) hypothesize as follows: "The effect of supplier asset specificity on transaction costs will be lower within a multidivisional corporation than in relational contracting with market suppliers". Consequently, with corroboration from testing the hypothesis, their hypothesis became a true hypothesis as it passed the test. Although Gordon and Poppo (1991) asserted that their hypothesis is supported, they also argue that the relational contracting with "outside" service provider is a way of diminishing transaction costs in a "specialized" market.

Different types of asset specificity have been identified (Williamson 1981; 1985, 55; 1989) and can also be found in the literature. Nevertheless, the types of asset specificity vary in numbers in different literature. For example Williamson (1985, 55) pointed out four different types of asset specificity: site specificity; physical asset specificity; human asset specificity; and dedicated assets specificity. However, the intention here is to only focus on the asset specificity relevant to this research (i.e., cost related).

Location or site specificity refers to a specialized investment made on location (i.e., premises) where services should be delivered from, to the buyer or seller of the services. Basically, premises proximity to the buyer or seller of the services is for diminishing delivering and transaction costs (Williamson 1989, 143). In addition, Williamson (1985, 119) point out that the cheek-by-jowl proximity of facilities to each other necessitates a bilateral agreement between the involved parties and thus it is suitable for a steady trading relation. However, the immobility (Williamson 1985, 97) characteristic of location specificity has some detrimental effects. Nevertheless, Williamson (1985, 55) asserted that the consequence of organizational action varies in each organization. Evidently, the relocation of the site requires considerable effort with great costs (Williamson 1985, 97, Brown and Potoski 2005). Furthermore, some buyers and/or sellers of the services are certainly not willing to embrace the services from a specific location. As a consequence, a specific location will only be appropriate for some limited buyers or sellers. This could increase transactions' costs. Moreover, Coggan et al. (2013) revealed that site

specificity increased transaction costs for the need to negotiate, search and collect more information.

Physical asset specificity refers to investment in equipment and machinery in the interest of a transaction-specific relation, which have lower value in alternative use (Jokow 1988) or for alternative user (s). It is speculated that the investment in physical assets is made either by one or both parties involved in the transaction-specific relation (Joskow 1988; Williamson 1985, 137). However, the ownership of the physical assets by one entity will definitely have repercussion for pricing of the services or product. Accordingly, Williamson (1985, 137) claims that the supplying entity would be operating under the direction of the purchasing entity of the physical asset, as it places the purchasing entity in a position to bargain. Nevertheless, Williamson (1981) considered the physical assets of no value by itself but the added value is only because of the increased demand in respect of design or performance. Moreover, Williamson (1985, 139) assertively pointed out that even a slight degree of asset specificity would make the cost determination problematic. Notwithstanding, Coggan et al. (2013) demonstrated that physical asset specificities did not increase transaction costs of both supplier and purchaser of transactions.

Human asset specificity (wholly specific (Williamson 1985, 54)) refers to investment in attainment (e.g., extensive training of an employee for a specific transaction) of idiosyncratic skills of human capital in a bilateral agreement inasmuch as this idiosyncratic human capital skills are not utilizable for any other purpose (Brown and Potoski, 2005). A good example would be when a firm (i.e., data center) is trying to extend the skills (e.g., specialized in a unique system of a customer in a data center) of an employee for a particular customer in a transaction-specific relationship. However, if the same skill is deployable for an alternative use or another customer, the value and cost is reduced (Williamson, 1983). In addition, TCE emphasizes arranging governance structure more carefully when the degree of human asset specificity increases (Williamson 1985, 243). Certainly, it is presumed that turning more attention to the governance structure and bringing in more changes would increase the costs. In addition to this, TCE emphasis is placed on governance structure, Williamson (1985, 303) posited that the antecedent of demands for higher wages will be the employer failure to provide safeguards (by specialized governance structure) for firm-specific assets. Furthermore, with the increase in the degree of human asset specificity (especially, if the investments in transaction-specific human assets are high) the increase in incentives will become a necessity for the continuity of employment (Williamson 1985, 256). The consequence of such investment is depicted in the following scenario.

Scenario: consider, the situation in which an employee with ample and efficacious transaction-specific skill resign or his/her employment is terminated (for any reason) by the employer. Consequently, it is not only the employer who loses because of the dis-

ruption and replacement training costs, but also the employee will lose as obtaining a new job with a transaction-specific skill will be harder and the employee will lose the value of his/her productivity as well. (Williamson 1985, 60)

Nevertheless, none-specific human assets in a bilateral relationship do not cause any start-up cost and would let both parties involved in the bilateral relationship to terminate the employment relation (if dissatisfaction appears) easily and without much costs (Williamson 1985, 245). An example could include professionals with relational non-specific skills and/or employees whose continuity of employment is not agreed up on in the bilateral agreement.

Dedicated asset refers to the investments in the specific assets that will expand (Williamson 1985, 96) the current production capacity for the sake of a particular customer or buyer; otherwise the supplier (i.e., data center) did not invest in them. The purpose of this investment would be that the particular customer will promise to continue to buy (huge amount of) the production (i.e., the service) till agreed upon time. Generally, unless the demand cost does not exceed the marginal cost obviously a firm will not produce a service or a product (Williamson 1985, 171). However, if the contract were to be terminated before the agreed upon time, the supplier would be left with excess production capacity (Williamson 1985, 194; Joskow, 1988) and thus it generally incur huge costs. Therefore, investing in the dedicated assets will be feasible merely when the demand cost exceed the marginal cost (Williamson 1985, 171). Investment by either parties (involved in the bilateral agreement) or common ownership according to Williamson (1985, 96) is rarely considered in this situation. Moreover, Joskow (1988) directly associated the investment in this situation to the supplier. Hence, the Service Level Agreement (SLA) length and the SLA termination period, certainly, concern the provider more in a bilateral agreement. Similarly, Williamson (1985, 194) considered the dedicated asset from the four types of specific assets to be in jeopardy if the trade is unilateral. Contrary to the bilateral contract is the unilateral contract, where only one entity or party makes a promise (e.g., an offered reward for providing the certain thing is an example of a unilateral contract). Accordingly, Williamson (1985, 194) affirmed that a reciprocal long-term agreement will serves as the protector of dedicated assets. Nevertheless, both general and dedicated assets inclusion in delivering a service to an entity make the pricing and charging calculation more complicated. For the simple reason, that a fair pricing would require the continuous assessment (whether a service produced by the special purpose technology is possible to eventually produce by general purpose technology). Similarly, Williamson (1985, 139) maintained that, resetting of the price periodically is not problematic (when asset specificity is zero) unless there is a slight degree of asset specificity.

Asset specificity (any), as demonstrated from the literature, adds to the complexity of a charging/pricing scheme and thus increases costs of a bilateral agreement. Irrefutably,

the author of this paper has acknowledged the presence of (above discussed) asset specificities, as well as other specificities, in the case. For example, accrediting a municipality to apply their (own) hardware and/or software or to pay just for the capacity in the data center facility are things which the author of this paper did not find in the literature.

There are some dedicated servers to specific services for which virtualization cannot be used and there are some (scarce) specific human competences. These should be priced differently to generic assets for which market prices should be applied. This study (to simplify the data center charging model) also suggests that, instead of (municipalities) applying own hardware and/or software, the data center should acquire those (benefiting) assets of the municipalities by crediting the municipalities which can be used as a deduction from their costs afterward. This will definitely support the case organization to relieve from insupportable financial burden of dedicated asset investment.

2.1.2 Ex-ante and Ex-post Transaction Costs

Before jumping to the exploration of the second transaction-specific attribute of TCE; uncertainty, the two critical terminologies, ex ante and ex post transaction costs are worth being explained.

Transaction cost is buried (existed) in both stages (i.e., before and after assigning the contract) of a bilateral relationship. Transaction costs incurred, before signing the contract are ex-ante transaction costs, and after signing the contract are ex-post transaction costs. Ex-ante transaction costs are costs such as searching, negotiating, collecting information, and verification costs. Ex-post costs are costs such as monitoring, renegotiating, and enforcement costs (Kutlu 2012.).

As indicated earlier that pre-investment in technology is essential for a service provider owing to increase the probability of being the winning bidder. Alternatively, in the case of a monopoly supply (Williamson 1985, 40) the service provider might price the services on the monopoly terms. However, Williamson (1985, 40) postulated that ex-ante bidding (bearing in mind that ex-ante biddings consist of ex-ante transaction costs) could avoid the pricing of services on the monopoly terms.

Investments made to the data center by city of Turku and/or SeutuICT-group (see section 4.2) prior the start of the operations are considered ex-ante costs of the case project in this research. In addition, (extra) costs incurred, prior or after the start of the operations, from the involvement of Tiera in the case project are ex-ante and ex-post transaction costs. Alternatively, these costs can also be considered as the additional accounting and transaction costs. However, the benefits of ex-ante and ex-post transaction costs (incurred by Tiera's involvement) might exceed the additional accounting and transaction costs.

2.1.3 Uncertainty

Martins et al. (2010) called uncertainty a “straightforward assumption”. Williamson (1989, 143) identified three types of uncertainty. The first two types are: primary uncertainty, and secondary uncertainty. Primary uncertainty is a situational or environmental contingency for example natural events (Helfat and Teece 1987), “technological shifts, and other exogenous changes” (Sutcliffe and Zaheer 1998). Secondary uncertainty arises from lack of sufficient communication between both parties involved in a reciprocal agreement (Williamson 1989, 143 according to Koopmans 1957, 147). The third type recognized by Williamson (1985, 57; 1989, 144) which he called “behavioral uncertainty”. Alternatively, Sutcliffe and Zaheer (1998), despite maintaining three types of uncertainty they classified the uncertainty as primary, competitive, and supplier uncertainty. Nevertheless, uncertainty brings many challenges (e.g., perplexity in the decision making process) especially to the service provider (Helfat and Teece 1987). For example, a decision that causes switching cost(s) is a challenge for both service provider and the customer. Moreover, Sutcliffe and Zaheer (1998) stated that uncertainty has influence on a firm strategic decision about its boundaries.

Environmental uncertainty: it is beyond the bound of possibility to anticipate all future contingencies (Williamson 1985, 70). However, Williamson (1985, 80) considered the decrease of uncertainty as usual in an industry whenever the industry in question matures. Moreover, Gordon and David (1984) considered vertical integration to be an effective way to lessen environmental uncertainty.

As indicated earlier, investment in a *physical asset* is made either by one or both parties involved in a transaction-specific relation. Obviously, “transactions with mixed investment attributes” (Williamson 1985, 80) will emerge in case both parties are involved. However, the transactions from mixed investment may retreat or remain with the extreme entity as a consequence of increased uncertainty (Williamson 1985, 80). The primary reason for this is, unless a third party such as court is involved, the other entity has the termination of the agreement as the only alternative; this is called a self-enforcing agreement (Williamson 1985, 168). Technological uncertainty (Sutcliffe and Zaheer 1998) that arises due to the fast pace of inventions or technological change appears to have considerable influence on the physical assets investments. Similarly, Heide and John (1990) found an inverse relationship between technological uncertainty and trade relation continuity (Sutcliffe and Zaheer 1998). In addition, Sutcliffe and Zaheer (1998) argued that owing to accelerating pace and the unanticipated nature of innovation, capital losses are greater and profit is lower. Predictably, both parties in a reciprocal agreement might be pondering too long to invest in the physical asset due to the technological change. Similarly, they might be unwilling to accept the high costs of the initial investment if they are uncertain about the usage period of a technology.

Human actors: behavioral uncertainty is considered central to an understanding about transaction cost economic issues (Williamson 1985, 57). The assumption in TCE is that human agent, involved in an exchange relationship, is subjected to bounded rationality (Williamson 1985, 30). Bounded rationality is described as the behavior with rational intention but limited cognitive competencies of a human agent (Williamson 1981; 1985, 30). In addition, Williamson (1985, 30) stated that human agents are habituated to opportunism, “which is a condition of self-interest seeking with guile”. Hence, it can plainly be posited that behavior uncertainty is about a service provider, buyer or seller changed behavior in post-contractual situation (especially in contractual incompleteness situations). Moreover, Alchian (1950) believed that imperfect foresight and human inability to cope with problems consist of myriad of variables as the two possible source of uncertainty that pertain to the human agent. The uncertainty from lack of communication is demonstrated in a decision contingency situation where one decision maker is unaware of concurrent decisions and plans made by other decision maker(s) (Williamson 1985, 57). Furthermore, behavior uncertainty seemed as intrusion whenever the asset specificity is in a nontrivial degree, because in a relation consisting of substantial degree of asset specificity, continuity becomes more imperative (Williamson 1985, 60).

Sutcliffe and Zaheer (1998) indicated, by implication, that purposefully reducing the transaction cost of a trade relation is possible by increasing the level of trust. As a result, behavior uncertainty is reduced and a more efficient governance structure is reached (Sutcliffe and Zaheer 1998). Similarly, Dahlstrom and Nygaard (1999) demonstrated that the implications of the inter-firm cooperation and formalization will be for the constraint or alleviation of opportunism. Sutcliffe and Zaheer (1998) also founded (by testing uncertainty in the transaction environment) that the decisions of human agents are affected by the extent to which human agents take information related to uncertainty into account. Hence, bearing primary and secondary uncertainty in mind whilst determining the costs of a data center, it perhaps influences the pricing services of a data center.

Assets specificity: Trade relations comprised of transactions with nonspecific assets can easily be acclimatized to a new relation, as continuity is a trivial matter (Williamson 1985, 79). However, continuity matters whence the degree of assets specificity arising to a nontrivial degree. Furthermore the increase in the degree of assets specificity necessitates special investments in a trade relation. Sutcliffe and Zaheer (1998) posit the view that behavioral uncertainty, which they called it “supplier uncertainty” (i.e., the opportunistic behavior of the supplier) has negative impact on the arguments for investing in transaction-specific assets.

Volume uncertainty is the volume fluctuations in the daily, monthly or during the period of a bilateral exchange requirement. Certainly such uncertainties increase transac-

tion costs. Gordon and David (1984) consider demand estimation and fluctuations in demand as the source of causing volume uncertainty. High volume uncertainty is clearly problematic and costly to both the provider and the buyer of a service. As a result of high volume uncertainty, the provider of a service is undergoing either excessive production capacity or excessive production costs; the buyer of the service is undergoing either excessive inventory or out of the stock problem. The prior situations require re-considerations or renegotiations of the initial bilateral agreement, and thus it increases the administrative cost which is a part of the ex post transaction costs (Gordon and David 1984).

In addition to the primary uncertainty which (almost) cannot be anticipated (e.g., environmental uncertainty) secondary uncertainty has also been noticed in the case project of this research. For example lack of sufficient communication between Tiera and Turun seutukunta municipalities. Behavioral uncertainty could probably arise from lack of sufficient communication as well. Additionally, volumes are not known nor the commitment of the parties to transfer their volume. The duration of the arrangement is also unknown. Evidently, such possible contingencies increase the pressure to have safety margin. Hence, the data center management has to consider (in the investments of SeutuICT-group) a high margin of safety to protect them from sudden changes in price or demand.

2.1.4 Frequent or recurrent transactions

Frequency or recurrence of a transaction in a bilateral agreement refers to how often a transaction is undertaken within a particular period of time and whether there are other entities or customers who could be treated similarly (Rørstad et al. 2007). Obviously, the infrequent transactions and/or contracts could increase transaction costs due to required negotiations for specific requirements of each transaction or contract and initial cost of building a relationship. With regard to which transactions differ, TCE attaches less importance to the frequency and volume of transactions compared with asset specificity (Williamson 1985, 52). Notwithstanding, transaction frequency is considered playing a significant role in coping with the economic organizations (Williamson 1985, 52). Hence, TCE considers frequency of transactions influential and related subject (Williamson 1985, 60) in transactions costs issues. TCE classified and/or considered three classes of frequency; one time, occasional, and recurrent (Williamson 1985, 72).

Bilateral exchange relations and/or asset specificity require developing of specialized governance structures. Certainly, high costs incur in development of such specialized governance structures (Williamson 1985, 60). In contrast, standardized transactions are underpinned by market governance (Williamson 1985, 79). Generally, relationship con-

tinuity and transactions recurrence are related and they are not trivial issues. Williamson (1985, 60) argues that for effortlessly recovering the high costs of the specialized governance structures, recurring large volume transactions are essential. Transaction frequency also has impact on reducing the transactions costs quite considerably (Coggan et al. 2013; Rørstad et al. 2007; Williamson 1985). The reason for reducing transaction costs are; reduction due to standardized or repeatable processes, similarity in the transactions of different customers, knowledge redeployment and no volume fluctuations (Rørstad et al. 2007; Williamson 1985).

Concerning uncertainty (among uncertainties), Williamson considers “behavioral uncertainty” as fundamental to transactions and focuses foremost on opportunism. He argues that opportunism could increase the transaction cost in the ex post transaction situations. Notwithstanding, Rørstad et al. (2007) argue that recurrent transactions increase the level of trust (Sutcliffe and Zaheer 1998), and thus reduce the opportunistic type of uncertainty. Likewise Coggan et al. (2013) demonstrated that confidence in information and trust had dramatic influence on reducing transaction costs of the administrators. On the basis of prior arguments, it can be assumed that transaction frequency has positive effect on reducing transaction costs and opportunistic behavior as well.

Coggan et al. (2013) claimed that transaction costs were not affected by the physical asset specificities. Conversely, frequency of the technological changes increase transactions costs (Gordon and David 1984). Clearly, not only frequent technological changes increase transaction costs but also frequent changes in the specifications of the components could be another causative factor in the increase of transaction costs (Gordon and David 1984). Similarly, Gordon and David (1984) stated that frequency of the technological changes increases administrative cost because the external coordination (i.e., coordinating with the supplier) costs might be higher than the internal coordination costs.

Likewise, asset specific transactions require higher investment (Williamson 1983) and are difficult to develop (Coggan et al. 2013). However, even asset specific transaction cost will be reduced (Coggan et al. 2013) as long as frequency is considered at the outset. Nevertheless, normally high asset specific transactions remain low (as they are rare in the market) in frequency (Rørstad et al. 2007). Therefore, it is unlikely to have highly specific transactions with high frequency (Rørstad et al. 2007).

Site specificity in transactions increases transaction costs (Williamson 1985, 97) (e.g., increased information collection, search and negotiation cost (Coggan et al. 2013)). However, Coggan et al. (2013) reported the degree, transaction costs were affected by the site specificity, as moderate. Coggan et al. (2013) pointed out that transparency in communication and requirements about the site expectation reduced the impact of site specificity on transaction costs. Certainly, transparency will be achieved as a result of frequent communication in a bilateral relationship.

Knowledge specificity (i.e., human actors' specific institutional knowledge) increases the transaction costs for "...*high knowledge specificity would limit the opportunity to capitalize on the economics of scale generated from transaction frequency*" (Coggan et al. 2013). In addition, there would be a need for negotiating the specific requirements of each offset transaction. Hence, the administrator transaction cost would increase as a consequence of increased offset transactions. However, Coggan et al. (2013) argument is that with recurrent transactions administrators were able to reduce the influence of knowledge specificity on transaction costs by developing policy with clear rules. In this case, transaction frequency affected the transaction costs by instigating a policy design and development.

As far as the possibility of (similarly) treating municipalities of Turun seutukunta is concerned, the best thing is their proximity to each other. This (proximity) portends similarity and comparability in demands of the Turun seutukunta municipalities. In actuality, this could generate or develop recurrent (similar) transactions in the case project. Thus, as a result of relationship continuity and recurrence of large volume transactions asset specific transaction costs will be reduced. Alternatively, the possibility of getting another user (i.e., a municipality) for a specific asset of a (affiliated) municipality is increased. As a result (of transactions frequency for example), the data center gets the opportunity to capitalize on the economics of scale.

2.2 OECD Transfer pricing Guidelines

Transfer pricing (TP) propose extensive solutions, diverse charging and/or pricing methods, for acceptance of organizations with autonomous entities. Indisputably, center of attention in the open market charging and pricing models is mainly on the external trade(s) whereas TP concentrates on both internal and external trade(s). The intention of newly established data center, Turku IT data center, is to trade exclusively with the affiliated entities of Turun seutukunta and expand their operation in this region. Hence, TP charging and/or pricing methods tend to be more applicable, to the case organization of this research, than the available charging or pricing models on the open market.

The *OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations* are generally accepted and transfer pricing guidelines are followed by all the OECD member countries. Finland being a member country of the OECD; the Finnish Tax Administration applies these Guidelines in transfer pricing cases. The latest version of the *OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations* reviewed, updated and published on the 22 July 2010. Moreover, these Guidelines have been reviewed and updated periodically (OECD 2010, 305). Furthermore, since its inception (*OECD Report Transfer Pricing and Multinational Enter-*

prises, 1979) and its approval in its original version in 1995, these Guidelines have been revised, supplemented and modified several times.

“The purpose of the OECD guidelines is to provide guidance on the application of the arm's length principle for the **valuation**², for tax purposes, of cross-border transactions between associated enterprises” (Laine 2012, 3). Moreover, most importantly in regard to this research; the valuation of intangible assets (OECD 2010, 31) and services also exist under the arm's length principle, despite the fact that the valuation of intangibles is considered complex, uncertain (OECD 2010, 262); and one of the most challenging topics in the transfer pricing area (OECD 2015).

Arm's length is the main principle of OECD transfer pricing and arm's length standards are agreed and accepted by OECD member countries. Application of arm's length principle is based on the process of comparing the conditions (including the price) in the contexts of controlled transactions between associated entities with the conditions of uncontrolled transaction between independent entities. As defined in the section 1.7 of this paper, *controlled Transaction* is a service transferred across a technologically separable interface between associated or dependent entities and *uncontrolled transactions* are transactions between enterprises that are not associated or dependent enterprises (OECD guidelines 2010, 25-30). This process is named in OECD guidelines as “Comparability Analysis” (OECD 2010, 41). Arm's length principle and comparability analysis are the two fundamentals and the core of selecting appropriate transfer pricing method (Laine 2012, 26). The selection process of transfer pricing methods has the aim to consider the strengths and weaknesses of the pricing methods; and to find the most appropriate transfer pricing method for a particular case (OECD 2010, 59).

OECD guidelines classify the transfer pricing methods into traditional transaction methods and transactional profit methods. However, traditional transaction methods are considered preferable, wherever applicable, to transactional profit methods. This is because they are most direct means of determining whether arm's length conditions can be established in the financial relation of associated entities. There are three traditional transaction methods, and they are defined in the OECD guidelines as follows: **1)** comparable uncontrolled price method (CUP method), **2)** resale price method, and **3)** cost plus method. There are two transactional profit methods, and they are defined in the OECD guidelines as follows: **1)** transactional net margin method and **2)** transactional profit split method. Notwithstanding, MNEs could retain the freedom of applying any other method (not described in the OECD guidelines) to establish prices, inasmuch as the established prices satisfy the arm's length principle. (OECD guidelines 2010, 59 - 61)

² The emphasis is added to the word "valuation"

2.2.1 The arm's length principle of OECD Transfer pricing

Arm's length is the prevalent principle of transfer pricing; and an international standard for the enterprises of OECD member countries used to determine transfer prices (Laine 2012, 25). Not only the MNEs but also the tax administrators of OECD member countries need to determine if the transactions are properly recorded in accordance with the Arm's length principle (Holtzman and Nagel 2014). Arm's length principle encourages associated entities to determine the price of transactions according to the market price (OECD 2010, 31, Laine 2012, 2). Undoubtedly, OECD guidelines (2010, 31) point out the challenges of determining market price in the absence of market forces.

Autonomous entities of associated enterprises often have the authority and privilege to bargain with the service provider of associated entities as if they were independent enterprises. An incorrect assumption would be; to assume that a service provider willingly accepts a price offered for its service by an independent enterprise if other enterprises are willing to pay more for the same service with quite similar conditions. Hence, certainly; the autonomous entities would respond to economic situation in accordance with the market condition and their relation with third parties and service provider of the associated entities. Consequently, the arm's length principle regards members of an MNE group as separate operating entities rather than as a part of a single unified business. A good explanation or logic in OECD guidelines, about how any autonomous entity would want to negotiate the prices is: (1) everyone in the management of autonomous entities would definitely be interested in boosting their own companies' profits because of their eager for record-breaking profit; and (2) therefore they will bargain until the established prices increase the profit of their own companies absolutely. However, hard bargaining will not ensure that the transaction prices are at the arm's length because the relationship between associated entities could have influenced the bargaining process. Nevertheless, making adjustments in order to approximate the arm's length transactions would not affect the contractual obligation (e.g., paying of a particular price, contract length) of associated entities. Therefore, arm's length principle is appropriate even if there is no intention of minimizing or avoiding taxes (OECD 2010, 31 – 42.).

Arm's length principle focuses its attention on the nature of the transactions between associated entities as the principle considers the associated entities as if they were independent enterprises (OECD 2010, 33). Additionally, Arm's length principle also focuses on the established condition in commercial and financial relations between associated entities including prices. OECD guidelines (2010, 32) also refute the deviation of associated entities in commercial and financial relations from the open market. Therefore, transactions of associated entities are compared with independent enterprises under comparable circumstances (OECD 2010, 33). In order to determine, if a service is ren-

dered between associated enterprises under the arm's length principle, it is crucial to ascertain whether an independent enterprise would have been willing to pay to another independent enterprise for a comparable service under the same circumstances or produce the service by itself, for example to enhance the economic situation of the enterprise (OECD 2010, 206). Nevertheless, OECD guidelines (2010, 34) indicate the complexity and difficulty of applying arm's length principles when highly specific or unique transactions are executed between associated entities. Therefore, a whole chapter "Comparability Analysis" in the guidelines is dedicated to finding and identifying potential and most reliable comparable transactions. OECD guidelines maintain in provision and keeping of solutions (in these guidelines) for highly specific or unique transactions. Yet, applying the most appropriate method would require obtaining adequate information. Moreover, OECD guidelines (2010, 34) refute the argument that a separate entity approach concerning the guidelines does not provide economies of scale. Furthermore, the OECD guidelines (2010, 34) claim that "there are, however, no widely accepted objective criteria for allocating the economies of scale or benefits of integration between associated enterprises". The Arm's length principle has to also take into consideration the government's policies and interventions such as price control, management fees, royalty payments and interest rate controls. Therefore, the arm's length principle urges that these government interventions are treated as the market conditions in a particular country (OECD 2010, 55).

The application of TP arm's length principle and the Comparability Analysis will certainly require less effort considering the nature of the transactions in the case organization. It seems possible that because of the similarities and comparability in demands of the Turun seutukunta municipalities, there are perhaps similarities in the nature of their transactions. As a result, (more and more) internal comparable transactions emerge and the need for external comparable transactions is likely to diminish.

For (each) associated entity of the case organization it might be essential to know how its requirement is being fulfilled. This is requirements of transparency. Different entities (may) need or require different levels of transparency. As a result of emerging (more) internal comparable transactions, the transparency in the case organization is clearly augmented and thus it can support the affiliating entities in the decision making process.

2.2.2 Comparability analysis

Comparability analysis plays a vital role in the application of the arm's length principle. This is because the application of the arm's length principle is based on the process of comparing the conditions (*including price*) of the controlled transactions between asso-

ciated entities with the conditions of uncontrolled transaction between independent entities (OECD 2010, 41). Comparison in the context of transfer pricing, as mentioned in the OECD guidelines (2010, 107), entails “the controlled transaction under review and the uncontrolled transactions that are regarded as potentially comparable”. The purpose of the comparability analysis is to find the most reliable comparable transactions. However, the search for comparable transactions is the initial step of the comparability analysis process. Basically, the internal comparable transactions could be reviewed first, that is, do any such internal transactions exist, before external comparable transactions are reviewed (OECD 2010, 108). Likewise, there might be obvious parallels between the internal comparable transactions under review, which constitute parallels between external comparable transactions and the transaction under review (OECD 2010, 115).

When comparability is determined it might be necessary to compare attributes or the “comparability factors” of transactions. Comparability factors as described in the OECD guidelines include characteristics of the property or services transferred, the functions performed by the parties, the contractual terms, the economic circumstances of the parties, and the business strategies pursued by the parties. However, the nature of the controlled transaction and the pricing method adopted determine which one of these factors matters the most. (OECD 2010, 43)

A typical process that could be followed to conduct a comparability analysis consists of nine steps. Still, the process could neither be considered compulsory nor does it guarantee that the outcome will be arm’s length. Nevertheless, the typical process is considered a good practice - despite the possible acceptance of any other process leading to the identification of reliable comparable transactions - since the outcome is considered more important than the process. (OECD 2010, 108)

It is (earlier in this paper) indicated that, the application of Comparability Analysis will require less effort in the case organization. In addition, the availability of internal comparable transactions in the case organization is likely to increase as long as there are increases in the number of affiliating entities. However, this will support the case organization (in Comparability Analysis process) and the affiliating entities (in decision making process) after the start of the operations. Yet, the case organization can apply the Comparability Analysis to compare transactions to those found on the open market prior to the start of the operations and if need after the start of the operations as well.

2.2.3 Comparable uncontrolled price (CUP) method

“The CUP method compares the price charged for property or services transferred in a controlled transaction to the price charged for property or services transferred in a comparable uncontrolled transaction in comparable circumstances” (OECD 2010, 63). The

comparable uncontrolled price method (CUP method, henceforth) is the most direct way of applying the arm's length principle. Thus any difference between the two prices indicates that the conditions of financial relations of the associated enterprises are not arm's length. Furthermore, an uncontrolled transaction is not considered a comparable uncontrolled transaction (i.e., comparable to the controlled transaction) for the purpose of the CUP method, unless at least one of the following two conditions is met: “ **a)** none of the differences (if any) between the transactions being compared or between the enterprises undertaking those transactions could materially affect the price on the open market; or, **b)** reasonably accurate adjustments can be made to eliminate the material effects of such differences” (OECD 2010, 63). Hence, the CUP method is preferable over all other methods, especially in cases that meet the above mentioned conditions.

Nevertheless, the OECD guidelines acknowledge the difficulties of finding transactions between independent enterprises that are similar enough as compared to the definition of a controlled transaction. Similar enough means that, no differences could have a material effect on the (transfer) price. Therefore, in such cases some adjustment is considered appropriate. However, the adjustment should not “routinely” hinder the application of the CUP method. On the other hand, Laine (2012, 28) pointed out the complication of finding comparable uncontrolled transactions to the transactions involving intangible assets. The reason for the complication might be special character or/and difficulty met in the valuation of transactions that involve intangible assets. (OECD 2010, 63-64; Laine 2012, 28)

CUP method is presumably a reasonable approach for the case organization to tackle the issues of determining and comparing comparable uncontrolled prices. Basically, this method enables the case organization to identify comparable prices from open markets for the transferred transactions (from data center to associated entities). Moreover, the facts, about comparable uncontrolled pricing, enable the management of the case organization to have the powers of reason when discussing the affiliation with an entity.

2.2.4 Resale price method

The main purpose of the resale price method is to let the associated entity make appropriate profit after covering all its selling and other operating expenses. Certainly, a comparable open market gross margin would be ascertained. For this reason, the starting point in the resale price method is the price, at which a service or product is purchased from the associated enterprise and resold to an independent enterprise. After the determining of the resale price, the resale price is then reduced by an appropriate gross margin (the “resale price margin”) from the associated entity purchased price. Generally, the application of the method is considered useful in sales and marketing operations

(e.g., operations executed by a distributor). The resale price margin (i.e. the gross margin) is the resellers (i.e., associated entities) profit earned from the controlled transaction. Hence, in the resale price method, the resale price margin is compared with the gross margin from comparable uncontrolled transactions. Therefore, the gross margin of an associated entity should correspond to the gross margin of the same associated entity in situations where a similar service or product was purchased and sold by an independent enterprise (OECD 2010, 65 -66.).

Due to the difficulty of finding similar or exact transactions from an open market, as mentioned in the CUP method, some adjustments are required. However, in comparison with the CUP method, a lesser adjustment is needed in the resale price method due to the service or product difference. The reason for this given in the OECD guidelines (2010, 66) is that a minor service or product difference is less likely to have an effect on profit margin than on the price of a service or a product.

The assumption in the resale price method is that the reseller does not add to the value of the service or product considerably. As the result of this, the determination of an appropriate resale price margin would be effortless (OECD 2010, 67). In contrast to this, applying the resale price method to arrive at an arm's length price might require more effort, when a service or a product is further-processed and/or transformed into a more complicated form prior to its selling (OECD 2010, 68).

The resale price method is likely to be applicable to the case organization. However, if the quality, price and resale price margin of the services are (absolutely) comparable with the open market (if an entity would have purchased the same services from the open market), then no motive will be left for the affiliation. Yet, reasonable margin should be allowed for the organization in order to cover its costs and stay capable of investing in up to date technologies.

2.2.5 Cost plus method

In the cost plus method, in contrast to the resale price method, the initial price or starting point includes costs that incurred to the service provider or supplier in providing services for an associated purchaser (i.e., an associated entity). "An appropriate cost plus markup is added to this cost, to make an appropriate profit in light of the functions performed...." (OECD 2010, 26). The final price (i.e., initial price + appropriate Cost Plus markup) might be considered as an arm's length price for the original controlled transaction (OECD 2010, 70-71.).

The (ultimate) usefulness of the cost plus method is high in situations; 1) semi-finished products are sold between associated entities; 2) *associated entities have concluded joint facility agreements or long-term buy-and-supply arrangements*; 3) *the pro-*

*vision of the services is made by controlled transactions*³. According to the OECD guidelines external comparability (i.e., comparable (un)controlled transactions of an independent enterprises) should be used as the guide, and internal comparability (i.e., comparable uncontrolled transactions of the same supplier) as the reference in establishing the cost plus markup of a supplier for the controlled transactions. In general, in the cost plus method the markups are computed by considering only the direct and indirect costs of service production. Hence, the operating expenses or costs are ignored. Essentially, the inclusion of only direct and indirect costs is called the gross profit analysis while the inclusion of operating expenses, as well, is called the net profit analysis. Yet, in some cost plus method cases some direct and indirect costs might be considered as operating expenses, because of the variations in accounting practices among OECD countries (OECD 2010, 71 – 74.).

Since there is discrepancy (because of the variations in accounting practices) in considering direct and indirect costs of a service production, it might complicate computing of markups. In applying the cost plus method, as indicated earlier, the case organization will certainly have considerable references (that are internal comparability) in establishing its cost plus markup. Nevertheless, the point at issue in the case organization is not only markups but also the operating cost as well. Markups are not the main concern since the case organization is a non-profit organization. Yet, the necessity for revenue (comparable to markup) is considered vital in order to stay capable of investing in up to date technologies. Hence, operating expenses along with direct and indirect costs of services production should be considered in the charging or pricing.

Incipiently, in the case organization there is no intention of recovering the initial costs of the hardware or physical assets from the municipalities joining the data center. Hence, in the issue price (at the start) the balance sheet value of hardware is zero. Subsequently, whenever / if this cost element is shown (which is a must-show) in the price, it may cause dispute or to have shock.

2.2.6 Transactional net margin method

The transactional net margin method (TNMM) is one of the two methods classified in the transactional profit methods category in the OECD guidelines. “Transactional profit methods examine the profits that arise from particular transactions among associated enterprises” (OECD 2010, 77).

³ Emphasis has been added to 2 and 3

Accordingly, transactional net margin method (TNMM) examines the net profit an associated entity makes from a controlled transaction. For this reason, it is considered to function in a similar manner to the cost plus and the resale price methods. On the other hand, the TNMM method compares the net profits (arising from controlled and uncontrolled transactions), whereas the other two methods mentioned compare gross profits (on resale) or gross markups (on costs). Hence, the claim, according to which the TNMM method functions similarly, means that the application of the TNMM must be consistent with the application of the resale price and/or the cost plus method in order to achieve reliability. Moreover, this means that the transactional net margin method cannot be considered reliable if each party makes valuable, unique contributions to a transaction. Thus, in such cases, if one of the parties account for all unique contributions made to the controlled transaction, the TNMM is acknowledged as a one-sided method. Yet, the appropriateness of the method is not entirely dependent on the condition that there are no valuable and unique contributions made by a transaction party to a particular transaction. In a case, where each party makes valuable, unique contributions to a transaction, the transactional profit split method is considered the most appropriate transfer pricing method. In general, functional comparability outweighs the product comparability when the transactional net margin method is applied. (OECD 2010, 77 - 79).

Certainly, the associated entities (i.e., the Turun seutukunta municipalities) in the case organization will not make any valuable and unique contributions to transferred transactions. Hence, the general applicability of the TNMM method to the case is perhaps certain. Moreover, similarity of the TNMM method to the cost plus and the resale price methods, in functioning, is an indication of its applicability to the case. However, TNMM is considered as a one-sided method in the case organization seeing as the city of Turku (in the initiation of the idea) made specific capabilities available to the service center as a capital contribution. Therefore, this study suggests repayment of expenditure, to the city of Turku, in compensation for the capital contribution.

2.2.7 Transactional profit split method

The transactional profit split method is the other of the two methods classified in the transactional profit methods category in the OECD guidelines. The transactional profit split method initially ascertains the profit from controlled transactions. The profits from services of associated entities are conjoined for a splitting purpose among the (same) associated entities. Obviously, the method operates similarly to split losses, should that be the result of conjoining. Subsequent to profits determination the method “splits those combined profits between the associated enterprises on an economically valid basis...”.

Furthermore, the distinction between the transactional profit split method and the other transfer pricing methods presented in the OECD guidelines is that the transactional profit split method is a two-sided method, whereas the other methods are one-sided methods. The two-sidedness of the method enables the transactional profit split method to offer solutions for *highly integrated* operations, for which a one-sided method would not be appropriate. (OECD 2010, 93)

The two-sidedness of the method gives the transactional profit split significant advantage over the other transfer pricing methods, discussed in OECD guidelines. A two-sided method would be more appropriate than a one-sided method for cases, where both/all parties make unique and valuable contributions to a transaction. The primary reason for this is that the involved entities of the controlled transactions may want to share the profits of the transaction(s) in proportion to their respective contributions. (OECD 2010, 93)

According to Miesel et al. (2003) a profit split method is often used, when other methods are insufficient to price a controlled transaction (i.e., in complex situations). Miesel et al. (2003) present examples of complex situations such as situations a) where a controlled transaction is so unique that it is almost impossible to locate an independent comparable transaction; b) where both parties possess valuable unique intangibles (e.g., skills) relevant to the controlled transactions. The OECD guidelines (2010, 94) points out that the strength of the profit split method lies in its ability to constitute the arm's length approach to such complex situations. This means that the method reflects actions taken by independent enterprises in similar circumstances should an independent enterprise face a similar situation. OECD guidelines (2010, 96) notes that there are a number of approaches to split profits, two of which are mentioned in the guidelines (i.e., contribution analysis and residual analysis). This research due to limitations, however, does not have the intention to explore the prior mentioned approaches.

This study considers the transactional profit split method applicable to the case. A possible explanation for this might be that each entity could possess valuable unique intangibles (e.g., skills) relevant to controlled transactions (Miesel et al. 2003). Profit splitting in the form of rebate (i.e., refund given to a purchaser) could be used in the case to compensate for making unique resources available. Hence, it is possible that the transactional profit split method with a CCA arrangement might establish a good solution to pricing.

2.2.8 Costs Contribution Arrangements (CCA)

The Cost Contribution Arrangement (CCA) “is a framework agreed among business enterprises to share the costs and risks of developing, producing or obtaining assets,

services, or rights and to determine the nature and extent of the interests of each participant in those assets, services, or rights”. There are many types of CCAs, but the *arrangement for the joint development of the intangible asset* appears to be the most common type of the CCA. The CCAs, discussed in chapter VIII in the OECD 2010 guidelines, are (highly) relevant to this study. After excluding tax consequences, the mentioned chapter of the OECD guidelines discusses and provides guidance on whether the established conditions of the associated entities for a CCA are persistent, logical and consistent with the arm’s length principle.

A CCA is a contractual arrangement where each entity’s proportion of contribution to the arrangement will be proportional with the expected benefits (to be) received under the arrangement. Furthermore, “each participant in a CCA would be entitled to exploit its interest in the CCA separately as an effective owner thereof and not as a licensee, and so without paying a royalty or other consideration to any party for that interest”. Literally, some benefits of a CCA arrangement could be perceived in advance even though there will be uncertain benefits such as the outcomes of research and development activities. Intangible assets of the participants are used for each entity’s own purposes rather than as a joint activity shared with other participants. It is possible that only one entity within a contractual arrangement is the legal owner of the property “but economically all the participants are co-owners”. For example, one municipality could own a municipal-joint data center as a legal organization, whereas all participants could share its costs. The existence of mutual benefits is fundamental to a CCA. Therefore, an entity may be considered as a participating entity only when the entity has a reasonable expectation that the CCA will deliver advantage(s) to the entity. Nevertheless, it is possible that the entities in a CCA will decide that a separate entity that is not a participant (Tiera in the present case) could carry out (partially) some of the activities in the CCA arrangement. Thus, compensation to the separate entity will be acceptable for services or advantages that the separate entity has yielded or provided to the entities’ CCA arrangement. (OECD 2010, 219- 223)

The SeutuICT-group members (as participating entities) and Kuntien Tiera Oy (as the separate entity of a CCA) definitely have quite similar situation and intention with organizations in a CCA agreement of transfer pricing. In addition, each and every one of Turun seutukunta municipalities (the autonomous entities of SeutuICT-group) would be entitled to exploit its interest in the CCA separately as the effective owner. Hence, this study considers the transfer pricing common type CCA which is *arrangement for the joint development of the intangible asset* relevant and appropriate for the case. The CCA of transfer pricing will be further discussed in numerous sections of this paper especially in section 5.6 where the applicability of the most common type of CCA is discussed and suggested for the case.

2.3 Charging and pricing schemes in practice

In the Information Age, an efficient Information Systems (IS) facility (i.e., a data center) with good quality services is considered vital to the success of independent associated entities. However, the prior argument does not tend to lessen the importance of the IT unit of a single organization or dependent entities. Respectively, the efficiency and good quality of IS services can be achieved only at some costs. Thus, the costs is a fundamental basis for the pricing of the IS services (Paradi et al. 1995). Further, recovering the incurred costs of an IS facility (i.e., data center) is essential for its continuity. Accordingly, prices-set for the services of the facility is a means to do that.

Various investigations, different methods from the recovery of IS costs (Paradi et al. 1995), and a myriad of pricing and charging schemes/concepts (e.g., Falkner et al. 2000; Li and Wang 2003, 2005) can be found from the literature. Li and Wang (2005) propose that certain specific objectives drive the design of the pricing schemes used for existing information system services, such as economic profitability and efficiency, high resource utilization, congestion control, and practicals. On the other hand, Falkner et al. (2000) state that in recent years the focus (of customers) has shifted towards the provisioning of real-time applications, which require stricter service quality assurances from the infrastructure of the IS facility. Accordingly, Ding (2007) posits that it is more difficult to determine the quality of *services* at the time of services purchase and that a higher uncertainty is associated with the purchase of an IS service than with a physical goods. Furthermore, he claimed that service providers and users increasingly move toward the combination of fixed and usage based service pricing.

Seemingly, the concern of the case organizations is in the quality of the services, in the price fairness of services between associated entities, and whether provisioning of the IS services is economically efficient. The belief appears to be, that by reviewing and understanding the logic of (some) IT service pricing scheme concepts/methods presented in the literature, it becomes possible to learn lessons, which enable the management of the municipal data center to develop a fair pricing model. That is, to design a charging/pricing model that meets the design objectives of the data center management and the customers (i.e., the associated entities). Moreover, it should be possible to discern a pattern in these concepts that suits the purpose of this research as well. Literature describes several pricing concepts and charging schemes. These include, for example, flat rate or fixed costs, usage-based (Paradi et al. 1995; Falkner et al. 2000; Li and Wang 2003, 2005); market-based (Li and Wang 2005); Paris-metro pricing, priority pricing, edge pricing, expected capacity pricing (Falkner et al. 2000), value-based pricing (Ding 2007), and cost-based pricing.

The aim of the present study is not to review every pricing scheme presented in literature. Instead of that the aim is to take a comprehensive look at selected pricing

schemes used in practice on the basis of the literature available on the subject. In particular, this research reviews and by doing that introduces the concepts in the *major categories of pricing schemes* according to the classification of Li and Wang (2003). This classification consists of flat rate pricing, usage-based pricing and expected capacity. Noticeably, (far-reaching for the case) Li and Wang (2003) have demonstrated an objective-oriented classification of charging schemes and categorized charging schemes based on the economic efficiency. Inevitably, the economic efficiency of pricing scheme is a motive (of the case organizations) for producing IS services through the group cooperation. Moreover, the classified charging schemes are, presumably the most commonly used charging schemes, and in practice charging schemes of the open market. Thus, it seems possible that this classification is relevant to the case and could have significant contribution to the case.

2.3.1 Flat rate pricing scheme

Due to the complexity of Information Systems, the charging of IS services exactly according to actual costs is considered difficult. Therefore, in the real world, IT service pricing could have little to do with the actual costs of the services. Flat rate price is a fixed amount per unit of time (e.g. day, month) charged irrespective of the services actual usage. According to Falkner et al. (2000), who used numerous criteria to evaluate various pricing concepts, the foremost advantages of the flat rate pricing scheme are its simplicity and convenience. Since the flat rate pricing scheme reduces users' transaction costs (Odlyzko, 2001) and measurements for billing and accounting are not required (Falkner et al. 2000). Therefore, the flat rate pricing scheme reduces the overhead costs of the service provider. Moreover, Odlyzko (2001) points out bundling as a major advantage in the flat rate pricing scheme for the service provider. From the service providers strategic perspective bundling means the offering of several services as a single package at a single price. This opportunity builds on the intuitive sense of consumers that they will receive an advantage. On the other hand side, real or perceived unfairness of this pricing scheme has been observed and pointed out by many researchers (e.g., Paradi et al. 1995; Li and Wang 2005) if IT services are used intensively. Nevertheless, Faulkner et al. (2000) pointed out the social fairness, no distinction between poor and rich, anyone can access the network with the same service level, of the flat rate pricing scheme. Finally, the flat rate pricing scheme is considered economic inefficient and to lack the ability to improve the economic efficiency of a network (Li and Wang 2003, Falkner et al. 2000).

Li and Wang (2003) have appended the Paris-metro and single service flat-rate charging schemes to the list of charging schemes of the flat rate pricing category. In the

Paris-metro charging scheme, the total network bandwidth capacity is divided into several subnetworks with slight variations to the flat rate pricing scheme. Thereafter, a price is set for each logical subnetwork and users are charged a fixed fee (flat-rate price) in accordance with the selected subnetwork (Falkner et al. 2000.). Evidently, price per time unit is still charged as in any other single service flat-rate charging scheme irrespective of the usage of the service (Li and Wang 2003).

The real or perceived unfairness issue of the flat rate pricing scheme arises when one associated entity (or a user, or a customer or a business unit) makes little or no use of the charged IS resources while another entity overuses the IS resources (Paradi et al. 1995, Li and Wang 2005). Moreover, in the flat rate pricing scheme the priorities of any associated entity (or a user, or a customer or a business unit) cannot be taken into account. Hence, usage-based pricing - in a widely held view - is considered an alternative pricing scheme to the flat rate pricing scheme.

As flat rate pricing scheme maintained its position in the open market and possibly can (simply) be put into practice, this pricing scheme can definitely be applied in the case as well. Yet, this study does not suggest flat rate pricing scheme to the case organization. Nevertheless, the case organization can categorize the (affiliated) municipalities according to their size and can, for example, charge a municipality a fixed price per size category.

2.3.2 Usage-based pricing scheme

The fundamental principle of the usage-based pricing scheme is, in general, to show or to present to the customer the “actual” volume of service used or costs incurred to the customer from the use of a service. In addition, it is believed that by realizing that the price accurately reflects the actual costs of the services consumed by the customers, they (i.e., management) become aware about the benefits of their actions and, thus are able to make informed decisions (MacKie and Varian 1994; Paradi et al. 1995). Yet, contrary to the belief, usage-based pricing has almost invariably proved unable to reflect the inherent value of information, that is, the content of a data packet (Falkner et al. 2000). Typically, the content of a data packet has a distinct importance for one customer but not for other customers. The packet might even have contrasting value to the same customer at various points of time (Falkner et al. 2000).

The usage-based pricing scheme category of pricing models has various forms of charging schemes. These include, for example, smart market, edge pricing, volume-based, congestion-based, distance-based, time-based, value-based pricing schemes. Li and Wang (2005) still argue that the commonly used charging schemes in the usage-based pricing scheme category are time, volume, and distance-based schemes. It is

noteworthy that they nevertheless claim that only distance and volume-based charging schemes are realistic and suitable pricing schemes.

According to Li and Wang (2005), *“Distance-based charging seems more realistic as the resources required to carry the transmission are often proportional to the distance. Volume-based charging is also suitable for pricing as it takes the characteristics of the Internet’s statistical multiplexing into consideration, where resources are allocated to channels only when receiving or sending data.”*

A usage-based pricing scheme, however, often has a fixed basis fee that customers have to pay constantly regardless of their actual usage of the service (Lehmann and Buxmann 2009). As indicated earlier (in this paper), service providers and users move increasingly toward the combination of fixed and usage based service pricing schemes. For example, monthly or annually paid basis fee is a usage-independent fixed cost. These monthly or annual fees include some basic services and capacity, and when the usage and capacity exceed (usually this is the case and it should exceed as it is part of the pricing strategy) the services or storage capacities, which are not included in the agreement, are usage-dependent costs (Lehmann and Buxmann 2009).

A major drawback of, and an objection to the deployment of, usage-based charging schemes lie in the incurrence of “additional” accounting and transaction costs (MacKie and Varian 1994). Additional accounting and transaction costs incur because usage-based pricing entails the measurement and monitoring of, for example, traffic, priority, volume, time and distance metrics. However, the benefits of a well-designed usage-based pricing scheme might exceed the “extra” accounting and transaction costs (MacKie and Varian 1994).

The basic idea of the time-based charging scheme is that the service provider charges users/customers different prices at different times of the day and/or different days of the week. The time-based charging scheme is an example of price discrimination. In this context of the present research price discrimination means that different prices are charged from different customers for the same service (Lehmann and Buxmann 2009.). The time-base charging scheme has a high probability for the service provider behaving opportunistically since it is easy to uncover the peak time of a business and introduce a higher price for that time.

Charging schemes, discussed in this paper, are presumably the most commonly used charging schemes and thus can be applied in the case. However, the purpose of this research is to try to demonstrate the most appropriate and favorable charging scheme for the case organizations.

Different forms of usage-based pricing scheme are in use in the municipalities of Turun seutukunta (e.g., Chargeback system or volume-based in the city of Turku). Accordingly, the case organization can perhaps, for example, charge the municipalities a fixed basic fee + usage-based charging. Chargeback system is discussed in the section

5.4 of this paper. Likewise time-based charging scheme (e.g., weekdays and/or limited time range) had been under-discussion in the case organizations. Moreover, expected capacity, of the affiliating entities, has predictably been the concern in the case organization in order to accurately predict the price for required services.

2.3.3 *Expected capacity pricing scheme*

Clark⁴ (see Falkner et al. 2000) was the first to introduce the expected capacity concept. In this pricing scheme the focus is on customers' expectations and their requirements specifications, for example, regarding traffic load. Thus, a customer will be charged according to the fulfilled capacity expectation of the network, without considering the actual usage (Falkner et al. 2000.). According to Falkner et al. (2000) the specification of expectations can be done in number of ways in addition to specifying the minimum and maximum capacities required. For example, it is possible to specify "the maximum transfer time of data objects" (Falkner et al. 2000).

If a customer exceeds the required expected capacity, the service provider is entitled to claim a supplementary charge from the customer. Contrary to this, should a customer not fully utilize the required expected capacity, the customer does not receive any refund or credit (Lehmann and Buxmann 2009) as a deduction from the customer costs. In addition to these schemes Li and Wang (2003) describe awarding (if usage remains within the traffic/usage limit) and penalizing (if usage exceeds the limit) as additional characteristics of the expected capacity pricing scheme.

Lehmann and Buxmann (2009) have de-emphasized the economic efficiency of the expected capacity pricing scheme. According to them, the time frame of a Service Level Agreement (SLA) between a service provider and a customer is assumed to be long-term agreement if the expected capacity pricing scheme is followed. Contrary to their argumentation Li and Wang (2003) found support for the economic efficiency of this pricing scheme. The prime advantage of this pricing scheme, as pointed out by Falkner et al. (2000), is that charging is based on expected traffic/usage volume instead of actual traffic/usage volume. Taking expected traffic/usage volume into account creates an either-or situation, should the expected volume not equal with actual volume. Thus, in such situations either the service provider or the customer will benefit. In a congested network the service provider will benefit and in a less congested network the customer might get advantages through good service quality. On the basis of prior research it appears that many customers over estimate, or underestimate (Lambrecht and Skiera 2006)

⁴ Clark D. D. (1998) *Internet Cost Allocation and Pricing*. MIT Press

their service usage (Lehmann and Buxmann 2009). Overestimation behavior is called flat-rate bias and under-estimation pay-per-use bias (Lambrecht and Skiera 2006). From the service providers point of view the other benefit of the expected capacity pricing scheme, as described by Falkner et al. (2000) , are savings from overheads. There is no need to measure overheads. Yet, Falkner et al. (2000) further emphasize that charging the excess traffic is “partially” decaying the advantages of no measurements. Nevertheless, the expected capacity pricing tend to require a constant watchfulness in order to ensure conformity to the usage specification (Falkner et al. 2000). Furthermore, pricing/charging scheme complexity impacts negatively customer assessment (Lehmann and Buxmann 2009). In addition to the customer-service provider traffic handling, “the scheme also handles inter-provider traffic” (Falkner et al. 2000). Moreover, Falkner et al. (2000) posit the view that the expected capacity pricing scheme is a socially fair scheme since everyone can negotiate contracts and access the network. On the other hand, they stated that rich customers have the possibility of purchasing better services.

Some other charging/pricing schemes, besides of those specified and classified by Li and Wang (2003) have been introduced (see, for example, Falkner et al. 2000), are in use and can be found from academic literature. Most of them appear to befit into the classification of pricing scheme groups proposed by Li and Wang (2003). Academic literature has identified such charging/pricing schemes as market-based, ISP / user-centric, game-based optimization and pyramid model (Li and Wang 2005); proportional fairness (Falkner et al. 2000); value-based (Ding 2007; Lehmann and Buxmann 2009); cost-based, competition-oriented, demand-driven (Lehmann & Buxmann 2009).

Case organization, by having reliable information about the expected traffic/usage volume of the affiliating entities, can certainly make informed decisions in development of the newly establish data center. Similarly, despite the controversy over the economic efficiency of expected capacity pricing scheme, this charging scheme is likely to give (the case organization in the beginning) a general impression of pricing. For example, since there are only a few users, this charging scheme can presumably be used in the beginning to divide costs in simple way.

2.4 Summary of the refereed literature

On the basis of review literature the following points are valid for the case (see Table 1 below).

Table 1 Applicability of the model / framework in the case

Model/Framework	Applicability in the case
TCE	<ul style="list-style-type: none"> <li data-bbox="491 376 1279 555">i) Idiosyncrasies of the case are: allowing the municipalities to apply their own hardware and/or software, the employment of each IT staff of the affiliating entity must not be terminated, <li data-bbox="491 568 1279 748">ii) Lack of (sufficient) communication among involved parties is noticed. Volumes are not known nor the commitment of the parties to transfer their volume. Duration of the arrangement is also unknown, <li data-bbox="491 761 1279 837">iii) Proximity, of municipalities, portends similarity in their transactions which can generate recurrent transactions.
TP	<ul style="list-style-type: none"> <li data-bbox="491 882 1279 972">i) Case organization trades exclusively/only with the affiliated entities, <li data-bbox="491 985 1279 1106">ii) Proximity, of the municipalities, portends similarity and comparability in their transactions which can generate plenty of internal comparable transactions, <li data-bbox="491 1120 1279 1209">iii) SeutuICT-group members are participating entities and Kuntien Tiera Oy is the separate entity of the CCA, <li data-bbox="491 1223 1279 1294">iv) City of Turku has initiated the CCA and made pre-investment as a capital contribution.
Open market pricing scheme	<ul style="list-style-type: none"> <li data-bbox="491 1339 1279 1473">i) Contrasting pricing and/or charging schemes are in use in the municipalities of Turun seutukunta (e.g., Chargeback system and volume-based charging in the city of Turku), <li data-bbox="491 1487 1279 1563">ii) Open market pricing schemes give the case organization a general impression of pricing, <li data-bbox="491 1576 1279 1653">iii) Expected traffic/usage volume of the affiliating entities concerns the case organization. <li data-bbox="491 1666 1279 1800">iv) Pricing scheme, in the case organization, is likely to be complex because the affiliation of the entities happens in several different ways, at several different times.

3 METHODOLOGY

3.1 Methodological and research strategy options

The present research is an exploratory case study (Yin 2003, 5-6), the empirical section of which is based on qualitative data and its analysis. Consequently, the research method selected for this study is the case study method. Yin (2003, page 2) provides a concise explanation over the case study method as follows: "...the Case study method allows investigators to retain the holistic and meaningful characteristics of real-life events...". Within the boundaries of the generic case study method, I chose the exploratory case study method (Yin 2003, page 6), a subset of exploratory research methods (Yin 2003, Fisher 2010, 182) as the precise research method and as of the related research strategy to conduct my investigation. Exploratory research methods allow researchers to determine the feasibility and practicability of their research. Yin (2003, page 4) notes that the majority of social scientists still posit the view that case studies are appropriate for the exploratory phase of an investigation. The use and/or the implementation of the case study findings are thus not parts of the (chosen) research strategy.

The shortcoming of case studies is that each case is different and one case is not representative for other cases (Fisher 2010, 70). Hence, the validation of findings and taking conclusions to a general level are the most challenging parts in the present research. However, Fisher (2010, page 70, according to Watson 1994) claimed that generalizations can be made from a case study if the unit of research is organizational processes. The logic is that there could be several comparable processes investigated in one case study, such as the pricing of data center services to several municipalities. In a similar tone to Fisher, Yin (2003, page 10) argues that theoretical generalizations ("analytic generalization") can be derived from case studies, whereas statistical generalizations cannot be made. Eisenhardt (1989) has even developed an eight-step method to develop theoretical constructs and models from case studies. The present research can best be described as a case study that addresses several processes.

This research uses transfer pricing as the "lens", which is used to investigate the pricing of intra-firm transactions in the context of a municipal-joint public data center, Turku IT data center, which provides data center services to these autonomous entities (municipalities). More specifically, this thesis examines how transfer pricing behaves or should behave when transaction costs (influenced by transaction attributes) are factored in. The findings of this study reflect both literature research discussed in section 2 and interviews. I interviewed together with another master's thesis student (i.e., Arttu Utti) the experts of the Turku IT data center services provider (i.e., Kuntien Tiera Oy) and the municipal CIOs from the Turun Seutukunta region as the prospective users of the data

center services. The purpose of the interviews was to collect empirical data that could be analyzed both the service provider and the buyer perspectives regarding the pricing of the services provided by the Turku IT data center. Semi-structured open-ended interviews were first conducted with the experts of the Turku IT data center in order to gain a general understanding about the role of a single data center as the service provider of numerous “close-by” municipalities, and put the data center into its context. The City of Turku is the first to join the Turku IT data center. The data center is actually created from the investment in kind by which the city of Turku transferred its data center activities to the new service company. The purpose of interviewing experts and managers from various organizations was to capture the diversity of views from the service provider and the buyers of the services as well as their assessments on different pricing models.

According to Fisher (2010, page 170) the adoption of open or semi-structured interviews is crucial for an exploratory study. He goes further and states that the researcher(s) of an exploratory approach should conduct their research in ways that do not presume to know what the researcher(s) will discover.

3.2 Empirical Data Collection

The empirical data for this research were collected by multiple means and by different data collection techniques such as interviews, participation to stakeholders’ meetings, and reviews of relevant documents. Table 2 below shows, which of the data collection techniques of the Yin basket (1994) were used.

Table 2 Yin’s basket

Data type	Used in this research
Documents	<ul style="list-style-type: none"> – SeutuICT strategy principles and the letter of intent, – The need for services definition of data center services, – Turku region 17 involved municipalities report about: <ul style="list-style-type: none"> ○ The number of ICT staff ○ ICT budget ○ IT operating costs ○ IT investments – Tiera data center services capacity ordering process, – Tiera data center services - service descriptions, – Information and articles from various websites, for example, the case company website.

Archival Records	Not applicable
Participant observations	Not applicable
Direct observations	<ul style="list-style-type: none"> – Participation in the meetings of involved parties in the data center project, – Visits to the data center facility.
Interviews	<ul style="list-style-type: none"> – Two pilot interviews, – seven interviews with the CIOs of municipalities and experts of the case company, – interviews were tape-recorded, – the interviews have not been transcribed into text.
Physical Artifact	Not applicable

The documentation included various internal documents such as data center services specifications, service descriptions, presentations and a detailed review of the company website. According Yin (2003, page 83) access to various sources of evidence increase the quality of collected data. However, Yin (2003, 85) also states that one source should not be perceived (a priori) to have higher quality than other sources. Furthermore, evidence that converge from numerous data sources will support the findings of this research. Basically, the process of data collection for this research was systematic and based on rigorous checking.

Interviews for this research were conducted between March 2014 and June 2014. Two pilot interviews were held to prepare the conduction of the interviews and to validate the interview data collection instrument. The pilot interviews involved persons from two municipal units within the city of Turku that were planned to be among the forerunners of the Turku IT data center customers/users. After that seven interviews were conducted with the CIOs of municipalities in Turun seutukunta (i.e., Turku region) and with the experts of the case company (i.e., Kuntien Tiera Oy). The interviews were tape-recorded with the consent of the interviewees. Prior an interview all interviewees were reassured that responses are treated with anonymity to promote open discussions. Prior the interview the interviewers also ascertained that the interviewees have knowledge about the theories and terminologies used in this research. Notes, with the minutes in the tape-recorder, were taken to ease analysis process and to keep the researcher closer to the data. In addition to these practices, basic and quick analysis of recorded interviews was done forthwith, so that interview questions could be modified (for improvement purpose) for the following interviews. Yet, the interviews have not been transcribed into text, since transcribing interviews is a lengthy task and was not considered necessary for this research. Although, the interview questions (see Section 3.2.1) were asked in English, the respondents had Finnish as an alternative language to

respond to the interview questions. Hence, most of the responses were in Finnish as the respondents were more comfortable to respond by using their mother tongue.

3.2.1 *Semi-structured interview questions*

Two separate semi-structured interview question sets were used in this research, one to interview the experts of the service provider and another to interview the CIOs and experts working for the municipalities. Yet, the questions, listed below in Table 3, were not *always* asked in the same order. Moreover, as almost all interviews were open discussion type interviews, there were various numbers of clarifying questions in between the semi-structured interview questions. They were used to clarify what the interviewee had said. The motive was to investigate and analyze the research problem from distinct standpoints, which reflect the interests of various parties or stakeholders. That is, the service provider and prospective customers/buyers were interviewed about how they assess different pricing models.

Table 3 Research interview questions

Question	Reference(s)
<i>Questions to IT services purchaser</i>	
Please introduce yourself and let us know your current responsibilities.	
What kind of IT services you are buying at the moment?	Frauendorf (2006)
What kind of IT services you think you should buy from the newly established data center? Give some examples.	Frauendorf (2006)
Why do you think you should buy the above mentioned services from the newly established data center?	Gordon and David (1984), Bon and Hughes (2009), Brown and Potoski (2005)
Please share your experience with us about IT services pricing and Service Level Agreement (SLA)?	Brown and Potoski (2005)
How well existing IT services delivery and costing structures (i.e., charging/pricing model) are meeting your demands?	Galkin et al. (2015)
Are you satisfied with the current charging/pricing model? Why? Why Not?	Samimi and Patel (2011), Luft (1997), Ding (2007)
When using/buying IT services what is your priority, quality or cost saving? Keep in mind that you “might” have fixed budget for IT services and/or for the IT department as a whole.	Galkin et al. (2015), Li and Wang (2005)

How do you consider current charging/pricing model and Service Level Agreement (SLA) from governance perspective and why? Easy! Manageable! Complex!	Brown and Potoski (2005), Heide and John (1990)
Regarding current IT services pricing and charging, what do think are the biggest challenges?	Falkner et al. 2000
How could you overcome these IT services pricing and/or charging challenges?	Helfat and Teece, (1987),Heini (2011)
What things regarding pricing of the services and /or SLA would you emphasize the most?	Brown and Potoski (2005),
What type of Pricing /Charging and SLA would you prefer?	Li and Wang (2005), Holtzman and Nagel 2014), Cecchini et al. (2013), Falkner et al. 2000, Eccles and White 1988,
What is your opinion about assets depreciation costs of the data center; won't it be an increase to your current costs? Note: it will be always added to you bill. However, you may have already covered the costs of your assets.	Cecchini et al. 2013
<i>Questions to IT service provider</i>	
Please introduce yourself and let us know your current responsibilities.	
What types of IT services you provide OR the newly established data center will provide or could provide to the customers? Give some examples.	Frauendorf (2006)
Tell me how or on what base you price/charge your customers?	Li and Wang (2005), Galkin et al. (2015), Samimi and Patel (2011), Lehmann and Buxmann (2009), Falkner et al. 2000, Eccles and White 1988, Ding (2007)
What are the current types of Service Pricing Models and Service Level Agreements (SLA)?	Cecchini et al. (2013), Li and Wang (2005), Hufnagel and Birnberg (1989)
It has taken/takes years for some of the Turun Seutukunta municipalities to join or buy services from the newly established data center, why?	Dudkin and Vällilä (2005)
Regarding current IT services pricing or charging and/or SLA, what do think are the biggest challenges?	Heini (2011)

How to overcoming those mentioned IT Services Pricing challenges?	Heini (2011), Cecchini et al. (2013)
What are your fixed and variable costs?	Yumei and Yang (2011)
What about Transaction Costs (e.g., monitoring, managing) are they fixed or variable cost?	Gordon and Poppo (1991), Dick (2005)
How do you treat staff in terms of cost, as a fixed or variable cost?	Yumei and Yang (2011)
Will you switch to a fixed price per month/year when the requirements stabilized? Why? Why Not?	Cecchini et al. (2013)
What kind of Exit terms options customers have in terms of costs?	Burham and Mahajan (2003)
How to make sure that the users are satisfied with your pricing model?	Heide and John (1990), Ding, Wei (2007), Bon and Hughes (2009), Cecchini et al. (2013)

4 CASE COMPANY

4.1 Current Status

Each municipality within the Turun Seutukunta (i.e., Turku region) has its own IT function / unit, which provides IT services to its municipal customer / users such as the employees and residents of the municipality. The purpose is to transfer some or all IT data center activities of these to be a single organization, Turku IT data center. Basically, in addition to skills deficiencies, lack of financial and human resources in general is a major challenge for the municipalities. Notwithstanding, for the purpose of this research, it is not feasible to explore, determine and describe the current pricing models, in use, of each and every municipality in Turun Seutukunta region. Furthermore, it is likely that the pricing models in the region are comparable. Therefore, this research intends to determine and describe the city of Turku IT department (that is a data center for the city of Turku), the in use, IS pricing model since, at its inception, the new data center (i.e., Tiera Data Center, Turku region; or Turku IT data center) will be managed by the Tiera management together with the Turku IT department management. The new data center was established in late 2014 in Sampoalinn. It is owned by the City of Turku, facilities and let out for Kuntien Tiera Oy. In addition, the current status of service provider (that will be Kuntien Tiera Oy) is identical to the current status of Turku IT data center. Accordingly, Turku city municipal organizations are the forerunner customers of the Tiera recent data center. Thus, Turku city data center could also be considered as a customer of the newly established data center. Irrefutably, Tiera has many other regional operation centers around the country. The city of Turku is the biggest of the municipalities in the Turun Seutukunta (i.e., Turku region). Nevertheless, the newly established data center is intended for the whole Turun Seutukunta municipalities. Turku City Data Center is currently situated in the DataCity building, in the Turku Science Park. The Turku IT data center provides IT services particularly for the internal municipal organizations of the Turku city such as museums and public libraries. Certainly, the data center recovers its IT costs and/or own expenses through a non-profit scheme from the municipal organizations.

We run (the business) in such a way that we charge (a municipal organization) for the costs incurred (by that organization).

.....plainly, Turku city IT services (organization) is running on normal or zero profit revenue, what we expend (on the IS service) we should charge

*the customer*⁵ (*municipal organizations*). (Management of IT department in city of Turku)

Evidently, the ongoing charging or pricing system of the Turku City Data Center is a usage-based IT Chargeback system. Basically, in a Chargeback system internal units of an organization are charged by the IT department for IS services pursuant to their IS services usage. Indisputably, IS Chargeback system holds widely divergent opinions and it has been a controversial issue (Drury 2000). Generally, the rationale behind Chargeback system has been usage control of IS resources (Hufnagel and Birnberg 1989) and some economic argumentation as well (Drury 2000). Undeniably, the controversy in the Chargeback system has concerned researchers in the academia as the fairness of the Chargeback systems had concerned researchers in the past (e.g., Hufnagel and Birnberg 1989). Finally, as Drury (2000) points out that Chargeback system is not a “panacea” of IT issues therefore less than half of the organizations have ever used it (Drury 2000 according to McGee 1987, Raghunthan 1994, Drury 1998). Apparently, the Chargeback system has been an internal organization charging system. Therefore, Chargeback system will not be sufficient and effective in autonomous municipalities’ joint-cooperation organization.

4.2 Future Needs

A need for a municipal-joint data center had been sensed. The city of Turku has taken the initiative in constituting and promoting SeutuICT-group. SeutuICT-group motive is the development of better IS services to users and creation of the conditions to produce them more *economically* and more efficiently through the group cooperation. At the time of conducting this research, Kaarina, Lieto, Naantali, Paimio, Raisio and Turku municipalities, university of Turku and Southwest Finland health care district were forming the SeutuICT-group. Since 2014 SeutuICT has included also the municipalities of Parainen and Salo; also Medbit Oy providing IT/IS-services to the health care districts in Western Finland. Nevertheless, participation of the other municipalities of Turun Seutukunta was anticipated perhaps. Thus, SeutuICT-group initiated the establishment of Tiera Turku data center.

⁵ This is a translation of, direct quotation borrowed from interviewee, responses mostly in Finnish for the interview questions that were asked in English. Thus, the following direct quotations are also a translated form of the direct quotations.

Kuntien Tiera Oy is a municipal actors-owned non-profit corporation. Therefore, the modern pricing or charging scheme will be inevitably a non-profit pricing scheme. Tiera's aim is to consolidate Turun Seutukunta municipalities in producing IS services in a joint-cooperation. In addition, the motive is to provide cost-effective IS services (the kinds of services that municipalities require) for the Turun Seutukunta municipalities. Predictably, purchasing of those types of IS services independently by each municipality from the open market wouldn't be cost-effective. Basically, substantial cost savings will be made by the power of joint-purchases and by distributing the costs of improvement and development among several municipalities. Hence, the joint improvement program is a fundamental part of municipalities' joint data center (i.e., Tera Data Center).

The big matter what the municipalities seek is that together they benefit from for example joint improvements; now, it (improvement) is not done independently but together. And the improvement Euros, municipalities could divide among themselves. And this is the big thing (Tiera Management)

Initially, ascertaining of the municipalities AS-IS and TO-BE states of the IS services are of the fundamental importance to the whole data center project. Definitely, Tiera, prior to this, has experience of managing this types of projects, (as this is not the first project for Tiera) therefore Tiera will undoubtedly share their current or on-use (in their other operation centers) pricing models, with the advantages and disadvantages of the models, with the municipalities management.

We are certainly running the business in a volume-based pricing model.....according to the capacity the price increases or decreases; so the pricing should stay to a (kind of) volume-based pricing model which is per giga (GB) or per user for example. (Tiera Management)

However, adapting "one for all" model or traditional pricing models certainly are not appropriate for each case and evidently it is not going to be accepted. Hence, management of the municipalities has had the opportunity to propose and develop own pricing or charging model.

I could also expose such a model (as we have been in collaboration with the municipalities); municipalities, among themselves, have been discussing such a model that they could share the percentage of the IS expenses according to

each municipality population (by cooperating and collaborating of two or more municipalities for example). (Tiera Management)

Partially, lack of an optimum and exclusive pricing model (for the Turun Seutukunta municipalities) is a disincentive to affiliation of the municipalities with the Tiera data center project.

An issue has been the tryout of approving the traditional pricing models (by the municipalities) such as Fujitsu or CG pricing models.... And we obliged (Tiera) to change.... by saying that this is not working, it cannot be done in this way. (CIO of a municipality in Turun Seutukunta)

Pricing is the biggest point of not joining the project at the moment. (CIO of a municipality in Turun Seutukunta)

Still pricing is the most important issue for the municipalities. (Tiera Management)

Normally, two or more municipalities invest in these kinds of projects. However, in this case the city of Turku has in the beginning been the only and prime investor in the physical assets of the newly established data center. Notably, the city of Turku, as the influential in this project, does not have the intention of recovering the initial costs of the hardware or physical assets from the municipalities joining the data center. The transfer of IT assets is handled as a merger and acquisition transaction, where the city of Turku sells its IT assets as investments in kind (apportti). Nevertheless, the data center with the initial planned investment in physical assets, evidently, could provide IS services to municipalities that are few and far between. For this reason, only a few of the Turun Seutukunta municipalities (excluding Turku municipality) could purchase the IS services with no initial investment or costs. Furthermore, the municipalities would have the opportunity of purchasing/renting a space in the data center for their own physical assets. Indisputably, this gives Turun Seutukunta municipalities the opportunity to purchasing IS services in a competitive price. However, after years of collaboration the municipalities are still in dispute with Tiera over price/charge since the price is a crucial issue for them. Simply, the reason for the dispute is lack of an *exhaustive* pricing and/or charging model. Accordingly, Tiera management believes that providing of a pricing or charging scheme has allowed some of the municipalities to determine and conclude (Tiera Management interview.).

Decisively, the ultimate ambition is not to turn a profit but to enable improvement in the quality of the IS services and at the same time discouraging the increase in the costs

of the services. Therefore, an optimum and fair pricing model is very crucial and demanding to achieve for Tiera.

5 RESULTS

5.1 Transaction Costs and Transaction Attributes

The salient facts of the transaction costs and/or Transaction Cost Economics/theory are exceedingly unnoticeable to the management of the case organizations and perhaps to the management of any other organization as well. This is because it is very difficult to draw a clear distinction between transaction costs and other managerial costs. Hence, a substantial number of management of the case organizations regarded transaction costs (TC) as “regular” management costs. Typically, costs incurred by involvement of a third party in establishing and maintaining of a partnership (of two parties) and unification (unification of associated municipalities in this case) are neither production cost nor management cost; they are certainly transaction costs. Seemingly, the role of Tiera in this case is the same as previously mentioned third party role. However, the essence of the prior argument was not to declare the role of Tiera inessential but to demonstrate an example of a transaction cost. Undoubtedly, an “added” transaction cost advantages could outweigh its disadvantages for a business. Hence, Tiera management experience (which is discussed as human asset or knowledge asset specificity) could reduce information collection and contracting costs (Coggan et al. 2013). However, there had been evidently opposing viewpoints from the Turun Seutukunta municipalities about the experience of Tiera management and Tiera has been considered to be in its incipient state. Tiera was established in September 2010⁶, that is, more than two years ago at the time of the data collection in the spring of 2014. Therefore, some of the municipal organizations decisions are pending in favor of joining Tiera for they want to wait and see.

Therefore, it is crucial to ascertain and comprehend the facts and factors that could raise transaction costs particularly when intending to develop a pricing model. In essence, transaction costs incur in both procurement and operational phases of services delivery (Dudkin and Vällilä 2005). Arguably, the determinants of transaction costs and the factors that affect transaction costs vary according to country (legal system), sector, project size and procurement time (Dudkin and Vällilä 2005). Essentially, it has been revealed by some researchers (e.g., Schepper et al., Dudkin and Vällilä 2005) that transaction costs in the procurement phase of public private partnership (PPP) are above the average costs of traditional public partnership (TPP). Furthermore, long-term character, ownership and financing structures are considered of the main causes of higher transaction costs in PPPs (Dudkin and Vällilä 2005).

⁶ see <http://www.tiera.fi/yritys/tieran-tarina>

Turku municipality has taken the initial and influential steps of pre-investing in the technology or physical assets of the Tiera Turku data center. Seemingly, this investment is in general (for the Turun Seutukunta municipalities) purpose technology. Clearly, it has been indicated that this pre-investment in technology could in the future cause conflict in a reciprocal agreement (e.g., Williamson 1983, Gordon and Poppo, 1991). However, it is believed that pre-investing in technology will not cause conflict if a provider willingly sacrifices at least a part of this pre-investment and if the provider comes from within a multidivisional corporation (Gordon and Poppo 1991). Nevertheless, Turku municipality sacrifice (credible commitment according to TCE) of pre-investment for these relationships could avoid the future conflict and at the same time safeguard (Williamson, 1983) the reciprocal agreement. Furthermore, Tiera could eventually be acknowledged as a multidivisional corporation with autonomous entities since each affiliated municipality owns shares of it or must own shares.

Asset specificity: seemingly, a vague notion (to some extent) has been noticed about asset specificity, its implication and transaction costs related to asset specificity during the data collection. For example about the site specificity:

That kind of thing I asked; is it possible for Tiera to have the same maintaining service in our building.we have a huge empty space with basic facilities (to be used as a server room). (CIO of a municipality in Turun Seutukunta)

From the statement above it can be speculated that the CIO would wish to retain the control of his data center because the power he has with his own data center and the municipalities' joint data center is very different since there is a board of advisory from different municipalities in municipalities' joint data center. Assuming that Tiera and that municipality have concluded that the empty space will be used as a server room; at first, it necessitates the relocation of physical assets of that municipality to a new location. Typically, relocating a site entails spending a lot of money and requires considerable effort as well (Williamson 1985, 97, Brown and Potoski 2005). Moreover, a new specific site increases transaction costs for the need to negotiate, search and collect more information (Coggan et al. 2013). Seemingly, this plan of that CIO is unlikely to find favor since for a small municipality it is not, considered, practical and economical solution.

We didn't require specific assets; we buy just capacity and we don't care in which computers you run it.we can buy a specific speed (of services) which we want; we are not interested in anything else if the speed

is sufficient to our needs. And we can change it (the speed) on the fly.
(CIO of a municipality in Turun Seutukunta)

Such changes (i.e., change on the fly) are, apparently, not factual. Generally, any change to the initial state of IS services requires renegotiation. Consequently, renegotiations increase the ex-post transaction costs. Similarly, such adjustment is a change in the specifications of the components which is believed to be a causative factor in the increase of transaction costs (Gordon and David 1984.).

Generally, human asset specificity is considered the most demanding, crucial and apparently exceptive matter of the Tiera Turku data center project. Typically, human asset specificity, according to the TCE, is an extensive training of employee(s) for a specific transaction or relationship – specific transactions, which is attainable with costs. Thus, this is an endogenous factor affecting or increasing transaction costs. In contrast, human asset specificity in these transaction-specific relationships (i.e., the relationship between Tiera Turku data center and Turun Seutukunta municipalities) is that all the entire human asset of the affiliated municipalities must be maintained (a publicly decided affiliation of each municipality). This type of asset specificity indisputably is an inevitable exogenous factor of transaction costs increase (Coggan et al. 2013) because affiliation is compulsory “perhaps” for both the provider and the consignee. However, the prior argumentation does not eliminate the necessity of “extensive” training for the employees of municipalities to be qualified for the newly established data center. Thus, probably investments are required in the attaining of idiosyncratic skills (Williamson 1985, 54) of human assets of the affiliated municipalities in these reciprocal agreements for the newly established data center is huge and complex compare with the municipalities’ “small” data centers.

Uncertainty is considered to be an assumption (Martins et al. 2010) and /or contingency (Williamson 1989, 143) and thus it can cause various challenges. Nevertheless, uncertain factors that pose serious challenges to the pricing or charging of the IS services is the main concern in this context. In addition, indicators of uncertainty in this research about the pricing are based on the literature and the interviews done for this research. It is likely that previous partnership and project experience (earlier indicated that Tiera has previous partnership and project experience) could be essential and advantageous to uncertainty avoidance and uncertainty tolerance. Predictably, assigning multiple roles to the management could cause an organization to face a very uncertain future. Hence, even an experienced manager (with multiple roles) could be uncertain, for instance, as to which pricing model would be suitable and acceptable for a particular customer.

The challenges (Tiera is facing) could be related to organization operation model....., in some particular cases, actors that have many hats on their heads or that have many roles (in this project); thus it is never an optimal position (or situation). (CIO of a municipality in Turun Seutukunta)

An issue has been the tryout of approving the traditional pricing models (by the municipalities) such as Fujitsu or CG pricing models. (CIO of a municipality in Turun Seutukunta)

Ideally, Tiera Turku data center has been designated for all the municipalities in the region of Turun Seutukunta. Basically, the expectations would have been that each and every municipality in the Turun Seutukunta region is inclined to affiliate to the Tiera Turku data center. Therefore, IS services needs of all the municipalities in the region of Turun Seutukunta would have been assumed and taken into consideration while calculating the cost saving in IS services production. Similarly, pricing or charging model development would have been proposed and contemplated respectively. However, the empirical evidence in this research showed that affiliation of many Turun Seutukunta municipalities is still uncertain. Moreover, the motive behind the affiliation of those already allied municipality had been a public or political decision. Broadly, or at least partially the uncertainty in the affiliation is related to pricing or charging of the IS services. As a result, a lower price for the services would have been expected, demanded or offered by the affiliating municipalities. In addition, such variations in demand estimation cause volume uncertainty that obviously increases transaction costs (Gordon and David 1984).

Frequency and volume of transactions has been deemed to have less importance compared to asset specificity in TCE. Nevertheless, frequent or recurrent transactions are considered crucial and influential in a reciprocal relationship or bilateral agreement. Accordingly, considerable reduction in transaction costs is believed to be as a result of transaction frequency. The reason for that, indicated in theory, is the possibility of knowledge redeployment and process standardization (Coggan et al. 2013; Rørstad et al. 2007; Williamson 1985.). Frequent transactions require frequent monitoring; frequent monitoring necessitates frequent communication; and frequent communication surely increases the level of trust (Rørstad et al. 2007). In addition, frequent communication would certainly generate transparency in a bilateral relationship. Furthermore, transparency in communication could make requirements and expectations to be transparent and consequently it reduces the transaction cost.

Scenario: consider CIO of the municipality who expected Tiera to provide IS services from their own municipality. Assuming that this expectation had been expressed

during the first communication between Tiera and the municipality, it would have given Tiera the possibility to immediately consider the expectation before the second communication and explained the advantages and disadvantages of the expectation during the second communication. If the expectation had been expressed after various meetings, then the results of the previous meeting had been in vain. Hence, by being transparent instantly in the expectation it would have refrained from discussing the affiliation of Tiera Turku data center and reduced “extra” transaction costs.

This research, albeit, due to the constraints on data collection, time and due to the procurement phase of the project, could not provide empirical evidence on the impact of frequency and thus it could not empirically back up the TC theory on this issue as well. Nevertheless, this research hereafter, with the selected framework, tries to examine how transaction-specific attributes involve influencing transfer pricing in intra-firm transactions exchange. Therefore, this research framework focus is on the antecedent of transfer pricing policies between entities. Hence, the detail factors related to the top oval of Figure 1 will be explained first followed with the explanation of lower oval where focus will be on the consequence of TP policies.

5.2 TCE as determinant of TP

Transaction costs theory’s primary concern is that the transaction costs of internal transactions should not exceed the costs of external transactions. Accordingly, it is claimed that the higher transaction costs in internal exchanges incur because of the problems involved in the price settings (or valuation of assets) of the internal transactions or exchanges (Eccles and White 1988). Obviously, the setting of the prices is done by involved actors in the intra-firm transactions. Hence, the TCE in general plays a significant role in minimizing the transaction costs by reducing the problems of internal transactions in organization with autonomous entities for example. Likewise, it has been postulated that organization of internal transactions has been affected by the TCE (Shelanski 2004). Essentially, Shelanski (2004) research evidence revealed the fact that minimization of transaction costs “is a significant determinant of transfer pricing policy”.

Transfer pricing with various methods assist the management in the price setting of the intra-firm transactions in an organization with associated entities. Nevertheless, adopting an appropriate transfer pricing policy or method is crucial and requires effort. However, problems certainly incur even if an appropriate transfer pricing policy is adopted. Thus, antecedents to transfer pricing policy are considered being imperative from the TCE perspective. A general consensus reached by the researchers divides transfer pricing into two large categories: i) prices set/mandated by the management of the main office of an organization, and ii) prices set by negotiating with each auto-

mous entities (Shelanski 2004 according to Eccels 1985, Kaplan and Atkinson 1989, Edlin and Reichelstein 1995). Seemingly, the case organization, at the time of conducting this research, falls into line with the second category of transfer pricing. Basically, whatever transfer category or method is being selected or used, transfer pricing procedures depend on comparable information for services or companies (OECD 2010, 41, 107,108,115). Predictably, locating of the comparable information is not always a straightforward task. This means, in principle, application of transfer pricing is based on the process of comparing the conditions of controlled transactions (i.e., internal transactions) of associated entities with the conditions of uncontrolled transactions (i.e., external transactions) of an independent entity or entities. Depending on the nature of the internal transaction and the transfer pricing method adopted; comparability factors such as characteristics of the services transferred, the functions performed by the parties, the contractual terms, the economic circumstances of the parties, and the business strategies are recommended in the OECD guidelines. Hence, from the prior argumentation it can be implied that transaction cost involved in the comparability analysis depends on the complexity of a transaction. The more complex the internal transactions are the more effort needed to compare them with external transactions. Therefore, high transaction costs typically incur in the comparability analysis of complex transactions.

Essentially, the evidence from the studies (e.g., Shelanski 2004) demonstrates that transfer pricing policy can be determined by the transaction- specific attributes such as assets specificity, transaction- specific investments and quality requirements. As a consequence, the application of transfer pricing will centrally be regulated by the main office management. Decisively, a direct link between the transaction-specific attributes and transfer pricing policy is demonstrated in some studies (Shelanski 2004 according to Eccels 1985, Hirshleifer 1956, Holmstrom and Tirole 1991).

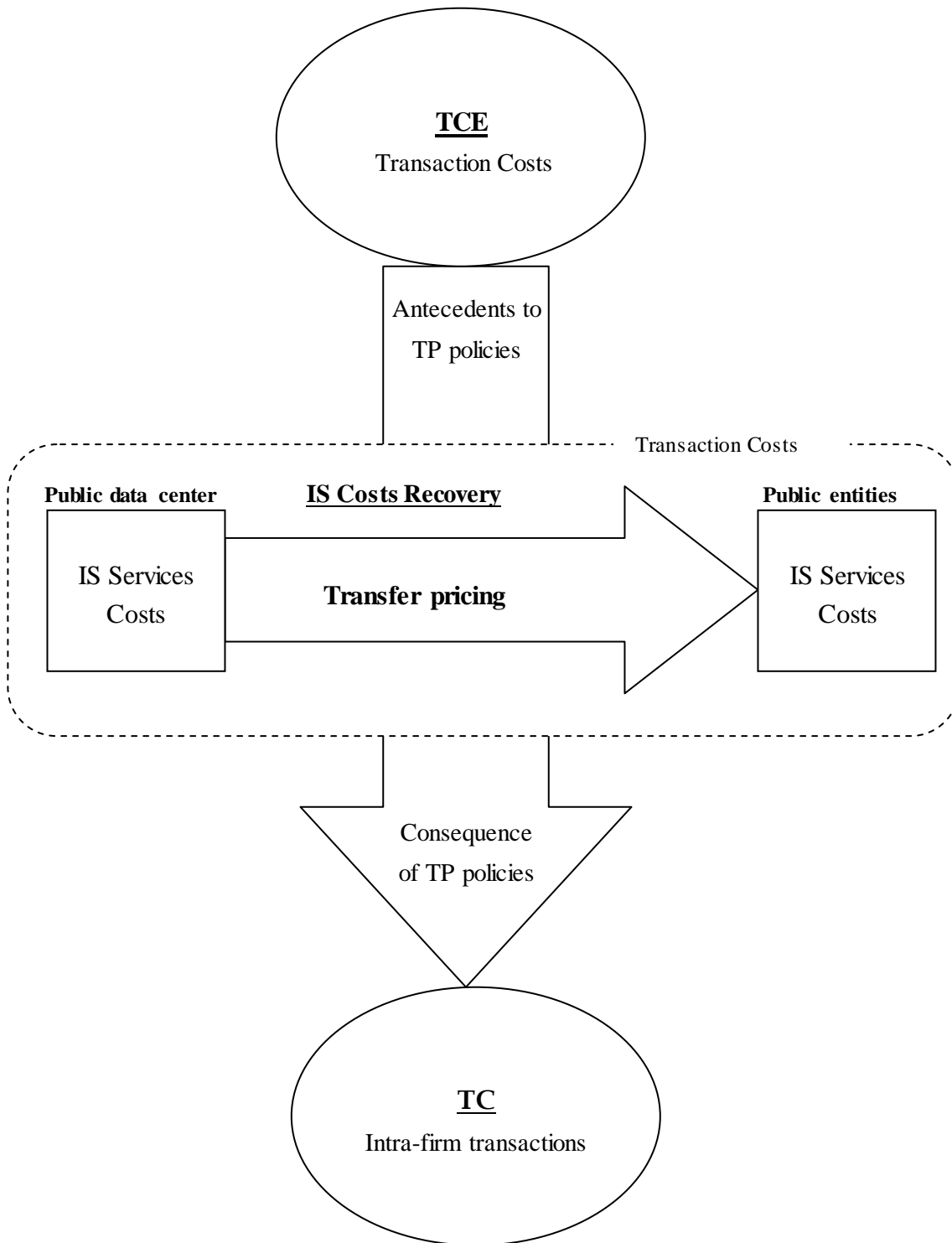


Figure 1 TP – TCE pricing (of) IT services Framework (Cecchini et al. 2013)

5.3 TP consequence factors

The inevitable and conspicuous consequences of transfer pricing policies on many aspects of an organization (Cecchini et al. 2013) will definitely be noticed whenever ap-

plied. Basically, the evidence argues the impact of transfer pricing on the transaction costs (Cecchini et al. 2013). Hence, it is likely, for example, that the complexity and negative effects of the transfer pricing policy (Cecchini et al. 2013) and transfer pricing methods will increase transaction costs. Similarly, complexity tends to lead to increased uncertainty of the transactions (Shelanski 2004) and as a consequence governance procedure of IS services will require “extra” efforts. Undoubtedly, “extra” transaction costs will incur because of the “extra” effort. Moreover, uncertainty as a determinant of the transaction costs (Williamson 1985) can certainly increase TC. Predictably, a reason for difficulty of transfer pricing application is the very flexibility of the transfer pricing policy. Additionally, unfairness in the transfer pricing processes is believed to affect the degree of opportunism among entities. Notwithstanding, it is maintained that an appropriate governance policy and procedure are able to mitigate negative effects of transfer pricing policies (Cecchini et al. 2013.).

A Further consequence is that by valuating the intangible assets, it is almost certain that transfer pricing affects the pricing of the transactions in particular. Hence, unfairness in the transfer pricing processes could cause conflict. Likewise, Eccles and White (1988) assert that existence of both price and authority cause conflicts or sub-optimization, and Terzioğlu and Steen (2014 according to e.g., Eccles, 1985, Schuster Clarke, 2010) go on to say that transfer prices affect the entities’ profitability and hence their performance which then cause conflict. Therefore, high transaction costs in the intra-firm transactions result from this conflict (Eccles and White 1988). However, the authors prefer conflict to sub-optimization despite the higher transaction costs that result from conflicts. The reasons by the authors for the prior argumentation are: i) usually performance monitoring of the (seller) entity result from conflicts and ii) the availability of the information (that might not be known or would be difficult and/or expensive to obtain) to top management.

When pay negotiations are allowed after the first entity (i.e., Turku municipality in this case) already invested (this is the scene in this case), then other entities (i.e., Turun Seutukunta municipalities in this case) potentially become capable of creating the hold-up problem (Cecchini et al. 2013, Johnson 2006). Thus, in this case, the latter can possibly ‘hold-up’ the former for the value of the commitment. Appropriately, transfer pricing policies and methodologies are considered offering mediation services that have the power to intervene in these types of disputes (Cecchini et al. 2013, Shelanski 2004, and Johnson 2006). Eventually, the effectiveness, advantages and disadvantages of transfer pricing policies vary substantially in how an organization put them into practice.

5.4 Chargeback System Analysis

Chargeback system is a type of usage-based pricing model where consumer entities are billed by the management of the provider entity in accordance with the IS usage. In a Chargeback system, a central management policy is governing all aspects of inter-firm transactions. Undeniably, the fairness of the Chargeback system has been a concern in the academia (e.g., Hufnagel and Birnberg 1989, Drury 2000). It is believed that Chargeback system has negative impact on the fairness perceptions of autonomous entities' management in particular. As a consequence, the autonomous entities' managers believed they had been charged for the delivered services unreasonably (Hufnagel and Birnberg 1989, according to Mautz, et al. 1983, 35). However, it is almost certain that the perception or belief of autonomous (consumer) entities' managers may contradict with the perception or belief of the (provider) entity management. Therefore, the latter group could perhaps believe and defend charges as fair. Furthermore, in a Chargeback system obtained satisfaction of (provider and consumer) management from the intra-firm exchanged is contradictory. Essentially, the effectiveness of the Chargeback system is ambiguous and/or controversial, since it has been reported that less than half of all organizations has ever adopted Chargeback system. However, it is not *only* fairness and perceptions that matter; for selecting an optimum pricing model other aspects of the model need to be evaluated as well.

Basically, a possible explanation for the downside of Chargeback or usage-based system is that variable costs form a large portion of an organization income, albeit it could have a basic fixed amount to be paid regardless of the usage. Thus, the provider probably remains with rather unpredictable revenue. Likewise, Chargeback or usage-based system could cause unpredictable or even unexpected bills for the purchasing entity as well.

5.5 Classification of costs: fixed or variable

The provisioning of services delivered to the entities as intra-firm transactions causes contrasting costs. Generally, these costs can be recovered for instance by using different methods and in the form of fixed, variable or marginal costs. Hence, identification of these costs is influential in recovering costs. Not only identifying, but also regarding costs as fixed or variable cost is basically the critical initial steps of pricing model development for an organization. Hence, when precise identification is done, costs can be allocated in a fair manner to all services then. Similarly, identifying and regarding costs as fixed or variable cost has influence on the fairness of services pricing. Basically, if the identification and regarding of costs as fixed or variable is NOT performed precise-

ly, it is almost certain that an organization recovers sensitive to usage costs with non-usage-sensitive pricing methods and vice versa . Seemingly, it is often an arduous task to distinguish between fixed and variable cost for the accountants therefore it is likely that they, to ease charging, regard some variable costs as fixed costs occasionally. As a matter of fact, Williamson acknowledges this as perception of the accountants. Arguably, this dilemma of fixed or variable cost can evidently cause one entity to subsidize services costs of other entity or entities. A possible explanation for this might be in the following example:

If the cost of a vehicle, used to travel for fixing a problem in a municipality, is the same to each municipality, thus distance is not considered as a variable cost. As a consequence, municipalities located near to municipal-joint public data center subsidize the vehicle cost of those municipalities located farther from the data center. Therefore, in fairness to every entity, it is extremely important that the accountants regard the cost as fixed or variable with prudence. Ideally, it is possible that multiple evaluators, puzzling over the dilemma of fixed or variable cost, could play a significant role in the solution of the dilemma. Moreover, a reasonable approach to tackle this issue could be that the provider focuses on cost classification occasionally. (Heini 2011)

5.6 An illustrative fair charging scheme

Obviously, it is certain that price has a pivotal role in the strategy of most companies. Accordingly, the price is considered the central and most controversial subject in the negotiations of the case company in this research. A possible explanation for the controversy might be that the provider entity and purchasing entities' management are considering the charging on grounds of fairness differently, that is, purchasing entities might consider a low transfer price as optimum and fair and the provider entity might consider a high transfer price as optimum and fair charging. Emphatically, the affiliated entities' management perspective on charging is a decisive factor which will determine the outcome of the negotiations series between the newly established data center and the municipalities. Therefore, it is of great significance for the joint-data center in particular whether they (municipalities' management) regard charging of the services as fair or not (Luft 1997.). Hence, it is essential to ascertain the factors that could influence the affiliating entities' management perspectives or judgments on the charging of the arranged services.

It is believed that sharing of *adequate* information about the costs of the services or costs of the data center as a whole with the purchasing and/or affiliating entity will influence the fairness judgments of the management. Accordingly, the amount of information about the costs is required by each manager, to perceive charging as faire, broad-

ly differ; the sharing of ADEQUATE information therefor was pointed out previously. Furthermore, steadily sharing of information about the costs of data center with the affiliated entities is likely to forestall the consideration of unexpected increased charging. Ideally, transfer pricing comparability analysis negotiations could be useful means of sharing cost information. (Luft 1997)

The case in this research is very identical with the model description by Johnson (2006) in that the entity or firm 1 (i.e., the city Turku) initially invest in developing the intangible assets and then it intends to transfer them to other entities (Turun Seutukunta municipalities). However, the exception is that he considers a multi-national firm with two divisions in two different countries, but in this case it is a joint-organization with different entities in the same country. Furthermore, he describes a similar case; the organization does not allow (probably a policy by the municipal authorities) the intangible to be transferred to outside parties. Perhaps, this is the reason why the SeutuICT-group has been initiated. Therefore, this study, from a practical point of view, considers a charging model to be fair and optimum that could solve or least alleviate the hold-up problem of the first investor that is the city of Turku and at the same time provides efficient investment incentives for other SeutuICT-group members.

In the section 5.2 of this research it was indicated that transfer pricing is divided into two large categories: i) administered transfer pricing and ii) negotiation-based transfer pricing schemes. These categories are represented by Johnson (2006) as Royalty-based transfer pricing and Negotiated transfer pricing. However, henceforth in this study, the term Negotiation-based transfer pricing will be used for the second category and this research will borrow the Royalty-based transfer pricing term from Johnson (2006) to be used as the term for the first category of transfer pricing.

In Negotiation-based transfer pricing system central office could allow the affiliating entities to discuss and bargain over the charging of intra-firm transactions as well as other terms of the exchange. The main disadvantage of this scheme is that it creates a hold-up problem for the first investor or the provider entity. The hold-up problem is considered a key issue and discussed in detail in the incomplete contracting literature⁷. Nevertheless, the negotiation-based transfer pricing system has advantages too. The main advantage of negotiation-based scheme over royalty-based scheme, pointed out by Johnson (2006), is that it provides investment incentives for the affiliating entities. This study will continue to introduce the royalty-based transfer pricing scheme with feasibility of renegotiating as its illustrative charging scheme. (Johnson 2006)

Royalty-based transfer pricing scheme with the feasibility of renegotiating is considered appropriate for this study because the center of attention in this research is also the

⁷See Williamson, Oliver E. (1985) for example.

intangible assets. Likewise, the proposition this study has just made is similar with and validated by other studies (e.g., Cecchini et al. 2013, Johnson 2006). Perhaps, the primary reason for royalty-based transfer pricing scheme with the feasibility of renegotiating, in case of the intangible asset is that it provides investment incentives for the purchasing entity while safeguarding the first investor or provider against the hold-up problems. Further, it is assumed that it might be an arduous task for Tiera, as the main office of Turku municipality joint data center, to specify a lump sum payment for each entity at the time of affiliation with the organization. Accordingly, Johnson (2006) considers the *ex-ante* indescribability and *ex-ante* uncertainty of the intangible assets that make the lump sum payment specification process difficult. (Cecchini et al. 2013, Johnson 2006)

This study considers SeutuICT-group members or Tiera Turku data center as an organization to have quite similar situation and intention with organizations in a CCA agreement of transfer pricing. Therefore, the findings from this study suggest that Tiera with SeutuICT-group members as associated organizations could adapt the most common type of CCA framework that is an arrangement for the joint development of intangible property. Furthermore, it suggests, considers and accepts (for this model) that the first payment of the CCA that needs to be paid, by an entity affiliating after the first entity has already invested, could take the form of an *ex-ante* royalty payment.

Hence, the *ex-ante* royalty payment in this case could be paid as the payment for shares (that must be purchased by any Turun Seutukunta municipality in order to become a SeutuICT-group member) of the municipal-joint organization which is Turku IT data center. A possible explanation and reason for *ex-ante* royalty payment or upfront investments (Johnson 2006) is to represent a model that can motivate upfront charge or investments. Accordingly, it is also believed that delivering of intra-firm transactions for the transfer price equal to the marginal cost will not be capable of attaining upfront investments (Johnson 2006). However, a key finding of this study is that in the case organization the *ex-ante* royalty payment or upfront charge is not considered for the reimbursement. Moreover, the study found out that the Tiera Turku data center currently (with the current investment) could provide service beside to the city of Turku, at most, to two other municipalities of the SeutuICT-group. This paper, scrutinized the situation as whole in order to devise a scheme, asking who should invest if more than two entities are going to affiliate with the organization. Thus, in fairness to each municipality, this study further suggests that share-buying (or selling of shares) of the firm is done according to the number of inhabitants in each municipality, or alternatively, share split is done according to the population of SeutuICT-group members. Seemingly, it is possible that the *ex-post* costs of the data center could be fairly apportioned according to the shares of the firm among the SeutuICT-group members thereafter. Essentially, a CCA is a contractual arrangement where each entity's proportion of contribution to the ar-

arrangement will be consistent with the proportion of expected benefits to be received under the arrangement.

6 DISCUSSION AND CONCLUSION

6.1 Discussion

In general, TP has two functions: i) to construct solutions for business challenges of associated entities and ii) to play a staunch advocate role in income declaration of MNEs for different tax authorities. In addition, CCAs for various purposes (e.g., acquiring centralized management services) of intangible property are quite common and they are becoming increasingly important in the global economy. Hence, the first function of TP was considered for this thesis as the objective of this thesis was to investigate the possibilities of developing a fair charging model particularly for intra-firm transaction costs of intangible assets or services of an organization. For an optimum solution easily begin to form, for the challenge assigned to this thesis, research question were set up. An organization as the IT services provider, for several autonomous entities, preparing to launch number of IS services for its entities was selected as a case company. Several managers were interviewed for acquiring information on the organization, its entities as well as on the subject.

The economics literature and academic research, which focused on TCE for various organizational issues, indisputably expect TCE to be capable of figuring out those organizational issues well. In addition TCE is a useful framework for understanding a wide variety of organizational issues. The focus of this study was to investigate the important role TCE, in particular transaction costs, can play in affecting the subject to price intra-firm transaction costs. The focus was principally on the impact of TC on CCAs that govern internal exchanges between providers and buyers.

Based on the findings of the study, a TP – TCE pricing (of) IS services Framework (Figure 1) was created as a conceptual tool for illustrating the structure of transferring costs of a firm providing IS services for its affiliated entities. The framework illustrates TP as a tool for transferring costs of a joint-entity data center to its affiliated entities. Basically, the framework illustrates TP in the context of TCE. Hence, the framework displays TCE as an antecedent factor for TP and then depicts how TP has consequences to intra-firm TCs.

The study posits the view that upfront charge is vital (perhaps in this case) for a fair and optimum charging model. It was also showed that it is not an optimum choice to provide and deliver IS services for few associated entities for the transfer price equal to the marginal cost. This study believes that it is clearly a sign of showing favoritism towards some of the entities. Hence, it is likely that this will negatively influence and might gradually change the perceptions of those who would already have thought affiliation as an inevitable choice.

It is perhaps a widely held view that having external customers beside the internal entities will exacerbate transfer pricing. However, this study does not necessarily refute the view, since it was revealed that it is not the matter in the case organization. It is possible that some researcher hold the view that tracing of TP experts is a challenging task. However, this study posits a different view that finding of TP experts with the skills of multinational tax issue might be difficult to find. Notwithstanding, taxation issues, domestic and international, was not focus of this study and it is not considered a related issues in this study as well, since the case company is a tax-exempt service provider. Therefore, application of TP for the case company possibly does not require much effort in comparison with multinational organization. Similarly, it is likely that finding of a TP expert will not be a troublesome issue.

The case study has also revealed that tryout of approving the traditional pricing models (maybe without customization) evidently caused disagreements. This disagreement could possibly be somewhat stronger in the public sphere compare with the private sphere. The reason for the tryout could possibly be related to the assigning of multiple tasks to a single manager. As a result, renegotiations are necessitated and thus it increases TCs. Transaction costs increase as a result of renegotiations is a matter discussed in TCE. However, it seems that the costs increase is due to the renegotiation constraints on the initial contract. Therefore, the inclusion of renegotiation or feasibility of renegotiating in the initial contract could possibly mitigate the cost increase of the ex-post transactions.

Finally, this study asserts or at least has the sense that its objective is achieved by presenting the development of an illustrative fair charging model in the section 5.6 of this paper. The model suggested that sharing of *adequate* information about the costs of the services with the management of purchasing entities since it will influence the fairness judgments of the management. Royalty-based transfer pricing scheme with the feasibility of renegotiating was proposed for recovering a municipal-joint data center costs and for solving the identified challenges. Accordingly, it was also found that every entity management not necessarily demands the same amount of information to be able to perceive charging as fair for example.

6.2 Research Limitation

Despite reaching its aims, this study, like any other research, has been conducted with some distinct limitations. First, perhaps the most severe limitation of the study is that the transfer pricing context used in this study is not to satisfy (domestic) tax authority but to fairly price the intra-firm transactions; typical application of transfer pricing will

assuredly be quite different. Secondly, the interviewees' perceptions of transaction costs could have influenced their preference for a pricing model or ideal pricing model.

Moreover, although the key informants were top management of the case organizations; this study could collect limited information from the limited number of management with the vital role (i.e., Turku data center and Tiera) in this project. Limitation in collecting information has also been due to the time constrain and organization being at its early initial state. Therefore, the findings of the empirical study did not contribute to the research nor nearly enough. Moreover, the information acquired seemed trivial in relation to the subject under discussion since it was partially too vague and abstract that it would authentically advise to solve complex organizational problems. Ideally, the number of interviewees from the quoted management would have to be more than two. There are always methodological limitations associated with gathering data from a less number of sources. Therefore, it needs to be taken into consideration that because of the methodology the study is not satisfactory for making generalizations of any kind. However, it was not the research design which caused this but caused by nature of the subject and the status of the case company.

For the sake of a fair assessment of the results of this thesis it is momentous to point out some major challenges faced while conducting this research. First, the subject of the thesis, for some obvious reasons, perceived to be rather challenging. Moreover, lack of relevant research material available in this field was another challenge. Unavailability and/or hard to obtain information about the cost structures (even case organization), charging or pricing principles, excepts the most common charging models, made industry benchmarking more difficult.

However, the exploration in this study had been appropriate to the research questions; the empirical sample clearly limits the capability of generalizing the results. Moreover, knowledge of transfer pricing is another limitation that could bias the results of this study to some degree; this problem was partially mitigated by dedicating time to the extensive study and investigation of the subject.

6.3 Conclusion

The objective of this study was to investigate the possibilities of developing a fair charging model for a public municipal-joint data center. The price has significant influence on the intra-firm exchange of an organization with autonomous entities since there is no use or minimal use of authority. However, the findings from empirical evidence revealed that political decision of a municipality could lessen the influence. Obviously, political decision of a municipality ordains the affiliation with the provider.

In general, CCA is for joint development (e.g., of intangibles), joint research, producing services or obtaining benefits anyhow. For a CCA to be developed at least two parties are required (related or not). Accordingly, CCA in this context is for joint development of intangible assets and management of IS services in a shared service center. An issue in the case organization that should, certainly, concern every participant of the CCA is the determination of re-partition of costs among the CCA participants while affiliation of the entities is happening in several different ways, at several different times. In addition, active involvement of participants in the CCA and control over the CCA activity are other issues which needs (to be given) careful consideration in the case organization.

Ideally, fairness in charging models of the services is vital for judicious use of resources, even though putting this into practice could require much effort. There are many challenges in intra-firm transfers an organization could face after a CCA is structured. Charging for the intra-firm transactions and creation of incentives to coordinate the CCA are probably the major challenges. TCE, besides assisting in resources utilization and effective cost reductions, could also assist in the organization and cooperation of a CCA. Transfer pricing frameworks and methodologies are seemingly capable of mediating the activities affecting the CCA agreements.

6.4 Contribution and Further Studies

This study could possibly be seen as a significant contribution to the transfer pricing methodologies since it tried to investigate the applicability of the methodologies in a domestic environment while the focus from tax issues abstained. Furthermore, this research will be as an enrichment for the management of the case organization which perhaps assists them in prices determination of the intra-firm transactions. The study contributes to TCE since it, probably, provides new insights from the transfer pricing literature.

Further investigation of the subject in similar organizations is indispensable for the extent to which the findings of this research can be generalized. This study could also be replicated within the same organization because by now perhaps the performance of the provided services is experienced (by municipalities) either by usage or by follow-up. Thus, the perception of services price from the data center might have changed. Another possible area of future research (an arduous task though) would be to investigate the energy consumption costs of the case organization and compare the impact it has, as a fixed or variable cost, on the fairness of intra-firm transaction costs. Certainly, continuous high energy costs (fixed or variable) could possibly determine the transaction cost since electricity or power costs, as a whole, form a significant percentage of total costs.

This study could be also replicated with different organizations across the country and in different geographic areas to explore the applicability of transfer pricing in those environments while the motive is not tax authorities' satisfaction but a fairly charging of affiliated entities for the IS services.

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