“Using Freelancers and In-House Employees in Computer Programming: A Transaction Cost Perspective”

Thanh-Binh Phung

Abstract—This study focuses on freelancers and in-house employees decision as a paradigmatic problem from analyzing transaction cost. Propositions developed from Williamson’s efficient boundaries framework. The influence of transaction cost on decision to freelancers or in-house employees components were based on indirectly through the effects of transaction uncertainty, asset specific and behavioral uncertainty. Proposition are developed and ramification for further research and practice are discussed.

Keywords—Freelancer, In-House Employee; Computer Programming, Transaction Cost Analysis.

I. INTRODUCTION

Over past three decades, transaction cost analysis has received considerable attention in human resource [9]. TCA has been used to study a wide variety of phenomena such as franchise governance, marketing, information technology sourcing. TCA is considered by many researchers to be a widely accepted and important framework in human resource. Here we specifically focus on the research that has been done on staff decision or more specifically, how to decide between freelancers and in-house employees in computer programming field.

Human resource plays a critical role in the strategic initiative of firm to meet customer need on time and create more benefit for company. When companies face with workload problem that is described as "the perceived relationship between the amount of mental processing capability or resources and the amount required by the task they will consider to contract with freelancers, instead of recruiting new employees to save the cost.

To make that decision, manager will take a notice with many factor related to uncertainty, freelancer’s behavior, asset protection, etc…Though a great deal of research has been done to date, to the best of our knowledge, no comprehensive review of the TCA-based freelancers and employees decision literature. Through our effort, we hope to encourage continued academic interest in the in the empirical testing and theoretical development of TCA in computer programming context. We begin our review TCA by briefly describing Williamson’s original framework [18]-[21]. We extend our discussion to consider how the original framework has been extended to model freelancer and employees decision. Finally, we summarize our findings and identify future research trends.

II. LITERATURE REVIEW

A. Computer Programming

A computer program (also software, or just a program) is a sequence of instructions written to perform a specified task with a computer [16]. Programming creates a set of instruction for computer to perform specific operation or to exhibit desired behavior.

A programmer or computer programmer is someone who writes computer software. It can refer to a specialist in one are of computer programming or to a generalist who writes code for many kinds of software. And a programmer can be referred to a software developer, software engineer, computer scientist, or software analyst.

The idea of using freelance programmers at the Controls Division of Moog Inc. East Aurora, N.Y., was implemented in 1972 and has all but alleviated the problem of delayed. There are many companies invite outside programmers to bid for the work when the workload gets too heavy. This provides a cushion and also a continuing source of new idea and approach that helps to keep the permanent employees fresh [17]. The programmers do their job with anyway they wishes and set his own schedule.

B. In-house Employee and Freelance

In-house employee is “a person in the service of another under any contract or hire, express or implied, oral or written, where the employer has the power or right to control and direct the employee in the material details of how the work is to be performed” (Black’s Law Dictionary, page 471). The relationship between employer-employee is affected by there significant factors: interests, control and motivation.

Freelancer has gained tremendous popularity. Freelancer stands for someone who is self-employed and is not committed to a particular employer long term. Freelancers can work with little supervision which has implications for the flattening (reducing layer of management of organizations. Some of popular job with highly-demand freelance are journalism, computer programming; graphic design and consulting. The “constantly working” but “unemployed” programmers are known as freelancers-professional programmers who work outside their client’s corporate cultures to complete the same kinds of work as their more traditionally employed counterparts.

Nowadays, software programming is one of field that is popular for freelancing. The world of software development and programming is doing through drastic changes. More and more companies are gearing towards different alternatives to better promote their products and service, so there are many chances to whom are doing freelance programmer. The growing need and demand of companies for

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freelance programmers, the availability of freelance jobs in the market also increases.

Freelance practice varies greatly. Some require clients to sign written contracts, while others allow performing work based on verbal agreements, enforceable through the very nature of the work. Some freelancers may provide written estimates of work and request deposit from clients. Freelance programmers have strong influence on the work force there are few academic works focus on.

The booming growth of the Information and Communication Technologies has attracted many people to work as freelance graphic designer computer programmer and developers and IT trainers. In the case of computer programming, people are attracted to work as freelancers because they can work from home and do their work at their own time and convenience. This paper is more relevant to the freelance programmers who get involved in the development of dynamic and interactive web application and systems.

When the company hires an employee, there’s generally a pretty lengthy process required. It will be simpler with freelancer hiring. Company will not hire employees when workload is heavy in short time. They will hire freelancer programmers instead of employees. The advantage (dis) of using freelance and in-house as indicated in table 1.

Companies can decide to use freelancers or their own employees when they face with workload and cost problems. The comparative production cost advantage will affect to use freelancers or in-house employees [2]. This doesn’t contradict to TCE because Williamson [19] showed that the objective is not to economize on transaction costs but to economize in both transaction and neoclassical production cost respects”. But it’s not easy to make the decision based on the comparative production cost advantage only because decisions are influenced by many factors, not only workload and cost pressure. This paper will consider factors from transaction cost theory.

### C. Transaction Cost Theory

Transaction Cost Analysis is a part of the “New Institutional Economics” paradigm that, unlike traditional neoclassical economics views the firms as a production, considers the firm as a governance structure [15]. TCA was developed to model a firm’s selection of an institutional governance mechanism to efficiently govern a particular transaction or type of transaction [7].

In transaction cost theory, organizations try to reduce the overall costs of exchanging good and services in the environment and the cost of supervising exchanges within the organization [18]-[21].

Transaction Cost Economics was developed by Williamson based on the interplay between the three key dimensions of transaction:

- Uncertainty
- Asset Specificity
- Transaction frequency

and the two main assumptions of human behavior:

- Bounded rationality
- Opportunism

### D. Can TCE be applied in This Situation?

Transaction Cost Economics explain why a transaction subject chooses a particular form of transaction instead of others. Transaction cost economics showed that make or buy decisions should seek to minimize transaction cost, defined as the cost of “planning, adapting, and monitoring task completion” [19]. Outside the firm, formal contracts can be used to define how transacting parties will behave. In-house transaction costs are labeled as “bureaucratic” or “hierarchical” costs. TCE can be used to explain freelancer or in-house employee decision in computer programming. Since decision can be considered as a choice between them, it is reasonable to assume that companies will go with using whom has the lower transaction cost. Therefore, TCE becomes a viable theory for explaining the freelancer or employees decision in computer programming. This paper will study this problem based on three key dimension of transaction cost and two main assumptions of human behavior.

### III. MAIN PROPOSITIONS

In what follows, each constructs is denied with reference to Williamson [18]-[21] and we developed how this study have conformed or digressed from this reference.

Key dimensions transaction costs According to Williamson [19], three critical dimensions for characterizing transactions are:

- Asset Specificity
- Uncertainty
- Transaction frequency

#### A. Asset Specificity

Asset specificity involves “specialized investments (in asset) that can not be redeployed to alternative use or by alternative user except at a loss of productive value” [18]-[21]. There identifies four types of specific asset:

- Physical assets whose engineering or physical properties are specifically designed to support a particular relationship
- Human assets involving worker skills, know-how, and information.
- Site specific assets hat are located in close proximity to a

<table>
<thead>
<tr>
<th>TABLE I</th>
<th>PROS AND CONS OF IN-HOUSE EMPLOYEE AND FREELANCER</th>
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<tbody>
<tr>
<td><strong>In-house employee</strong></td>
<td><strong>Freelancers</strong></td>
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<tr>
<td><strong>Pros</strong></td>
<td><strong>Pros</strong></td>
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<tr>
<td>- Making a higher income and to control your income.</td>
<td>- Health insurance, benefits, bonuses, and steady income.</td>
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<td>- Working from home, which can save a lot of time, stress, and money.</td>
<td>- More stability in working schedule and income.</td>
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<tr>
<td>- Controlling on all aspects of your work.</td>
<td>- Climbing the corporate ladder or grow with the company.</td>
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<tr>
<td>- More autonomy in your time management, designs, style, and work</td>
<td>- Consistent, steady income each month,</td>
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<td>- More direct contact with clients</td>
<td>- Mentors which can help you grow in your field.</td>
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<tr>
<td>- Using your time better, and can actually work on more than one project at a time.</td>
<td>- Training, continuing education,</td>
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<td></td>
<td>- In a team and brainstorm ideas</td>
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<td></td>
<td>- Not have to worry about it after 5pm, on weekends, nor holidays.</td>
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<tr>
<td><strong>Cons</strong></td>
<td><strong>Cons</strong></td>
</tr>
<tr>
<td>- Having to know more than just design and development.</td>
<td>- Little to no flexibility with a traditional desk job.</td>
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<td>- Working at anytime, including weekends and holidays.</td>
<td>- Must abide by company policy.</td>
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<td>- Willing to take jobs in many different areas.</td>
<td>- The tendency to limit your creativity</td>
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<td>- Knowing about your legal responsibility doing freelance.</td>
<td>- Project managers often give you impossible deadlines, which are difficult to meet.</td>
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<tr>
<td>- The tendency to be boring and isolating.</td>
<td>- More likely to be forced to specialize in one area, and you may not be able to use skills in other areas. For example you must work as either developer or designer, not both.</td>
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<td>- Requires exceptional organizational skills.</td>
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<tr>
<td>- Keep a consistent clientele</td>
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<tr>
<td>- Difficult to separate work and play.</td>
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Teylor Feliz, Freelancing Vs. In-House: Which Do You Prefer? 2010
particular exchange partner
- Dedicated Assets in plant and equipment
In computer programming practices, asset specificity relevant to investment in specialized equipment [1], software development activity [4], IT knowledge/experience base [11]. So assets in computer programming are more relate to the second type of specific asset. There are worker skills, knowledge, know-how, and information. In general, specificity shows weak correlation with outsourcing because of knowledge protect problem [1]. Knowledge-based views of the firm have focused on the problem of acquiring and protecting knowledge that affect the transaction costs of internal and external production [13].

Proposition 1: In computer programming, the greater asset specificity, the more likely the firms decide to use in-house employees rather than freelancers.

B. Uncertainty

Uncertainty is the inability of decision maker to specify a complete decision tree [19]. Similarly, Uncertainty relates to which a firm has enough information to make a decision and predict outcomes of that decision [3]. The higher level of uncertainty will increase the transaction cost because both parties in the transaction will spend more time and effort in monitoring the transaction cost.

Three basic types of uncertainty the firms will face [18]-[21]:
(1) Act of nature or change in human being.
(2) Inability of firms to ascertain the concurrent decision and actions of their exchange partner.
(3) Behavioral uncertainty that involves the potential that one or both parties would take advantage of its exchange partner if given the opportunities.

The firms face with uncertainty because they “lack of communication, that is from one decision maker having no way of finding out the concurrent decision and plans made by other” [19]. This uncertainty relates to environmental complexity and is relevant to the problem of bounded rationality of individual’s knowledge and the cognitive facility to process information in contracting between two parties [18]. Uncertainty will affect to the governance mechanism that firms apply for their decisions. Uncertainty is considered as a measurement problem which firm’s ability to measure freelancers’ ability [4]. In computer programming, particularly in software development it was difficult to measure and more difficult to use freelancers than in-house employees. When requirements are specified in advance and measure clearly, it seems that freelancers will be advisable [8].

Proposition 2: Level of uncertainty leads to decide using in-house employees rather than freelancers

Proposition 3: The more specific requirements and measurable outcome, the more likely the firms decide to use freelancers than in-house employees

We also defined uncertainty in term of behavior uncertainty that refer to opportunism. Williamson (1985) defined that opportunism is the strongest form in three level of self-interest seeking including obedience, simple and opportunism. Opportunism referred to “incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse”[19]. In other word, human being may find weaknesses in the contract and exploit these to their benefit. Degree of outsourcing is negatively related to potential opportunism because of knowledge protecting problems [12]. To firms in computer programming field, information, know-how asset or knowledge play critical role in firms’ development.

Proposition 4: The higher level of opportunism, the more likely the firms decide to use freelancers than in-house employees.

C. Frequency

Transaction frequency refers to the frequency with which transactions recur. Williamson [19] argued that higher levels of transaction frequency provide an incentive for firms to employ hierarchical governance structure because the overhead cost of hierarchical governance will be easier to recover for recurring transactions. In computer programming, frequency refers to the use of skills rather than software development projects [4]. This dimension has received limited attention in the transaction cost literature [5]. Some studies tried to classify its observations into different contract types based on the information on asset-specificity and frequency from their interviews. That combination will propose an “optimal” set of governance structure [19].

Non-specific assets lead to low transaction cost. In this case, the classical contract is adequate for occasional or recurrent transactions. For recurrent transaction, high asset specificity leads to high transaction cost. In this case, insourcing is adequate for firms.

Proposition 5: No matter what with frequency transaction (occasional and recurrent), the more non-specific assets the more likely firms decide to use the freelancers than in-house employees

Proposition 6: the more specific assets and transaction frequency (recurrent), the more likely firms decide to use in-house employees than freelancers

IV. DISCUSSION AND CONCLUSION

This paper contributes to organizational theory and management practice by using transaction costs theory to attempt to forecast in making decision between freelancers and in-house employees in computer programming.

Production cost advantages and workload pressure are factors that affect to decide freelancers or in-house employees. However, a better explanation of the phenomenon is necessary than what current papers of TCE offer in IT outsourcing generally. Based on the key dimensions (asset specificity, uncertainty, and transaction frequency) and main assumptions of human behaviors (bounded rationality and opportunism), we might conclude that all of them influence to decision in different ways with a variety of levels. Although the scope of this paper was limited in computer programming, this result could be extended to other variety fields such as music, journalism, editing, etc... The limitation of this paper included a limited sample of the literature that does not offer possibilities for strong evidences. A similar analysis on a larger sample would add to the generalizability of conclusions.

REFERENCES


