EXTRINSIC CLIENT CAPTURE IN PROFESSIONAL SERVICE: EMPIRICAL EVIDENCE FROM PATENT DATA

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Abstract - Client capture is an important concept in the relationships between clients and professionals, and prior studies focus on intrinsic factors within such relationships. Based on Taiwan patent data, this paper provides empirical evidence of extrinsic factors resulting in variance of client capture embedded in the context of patent filing services.

Keywords - Client Capture, Patent Service, Professional Autonomy, Professional Service

I. INTRODUCTION

Classical theoriesexpound that professionalsclaim the jurisdiction on a specific knowledge domain in accordance with their expertise applicable in this field. Professionals are supposed to behave independently and be responsible for providing services to clients based on professional autonomy.However, recent studies addressed that professional services are notpurely autonomous and that traditional theories ignore the influence of clients on professional services. The practical work of professional services is directly or indirectly influenced by clientsunder the considerationssuch asfinancial interests, suggesting failure of providing services based on professional responsibility. Prior studies refer to suchphenomenon as "client capture." Client capture couldundermine the profession identity and autonomy. While the degree of client capture raises,deprofessionalizationmay occur, resultingdeficiencyto play the professional role of gatekeepers for the public interest.

In the past decade, studies on client capture focused on the intrinsic causes withinthe relationship between clients and professionals. Other causes potentially forming client capture did not receive sufficient academic attention. In thisstudy,the research question focuses on how extrinsic factors affect the client capture of professional services. Based on Taiwan patent data, this study looks into this question from three aspects: the difference in the degree of legal restrictions, the differences in the strategic behavior of the clients, and the differences in the nature of the industry. The empirical results demonstrate that extrinsic factors do affect the outcome of patent filing services.That is,client capture is embedded essentially in the context of professional services.

The rest of this paperis arranged as follows. The second section reviews the theoretical background of professional services and client capture, the third section develops hypothesis of this study, the fourth section describesthe data and research method, the fifth section provides the results of this study, and the findingsare discussed in the last section.

II. BACKGROUND

Traditional viewpoints of the power relationship between professional service providers and clients is that clients rely on the expertise of professionals. Since knowledge asymmetry formed by the knowledge-intensive nature of professional workis one of the main characteristics of professional services, the clients have totrust professionals, and professionals shall respect clients and the societycorrespondingly [1]. In accordance with professional ethics and codes,professionalservice providers should persist autonomy, thereby protect the interests of the clients and the public. Functionalism emphasizes the social utility of professional autonomy from the perspective of social structure, and believes that professionals contribute tothe stabilization of society. Professional knowledge and expertise enables professionals to transcend or escape from the power stemmed from the society, politics, or economy.In addition, professionals connect different elements, resolve conflicts between these elements, and thereby maintain or strengthen the functions of society, andserveas an important component of modern social structure [2] [3]. Based on the perspective of social structure, conflict theory advocates that the power of professionals does not come from expertise;instead,professionals obtain more authority, respect and independence relying on social status and influence[2]. As explained by Larson [4], professionals develop their value orientation from the beginning of the professional education, and further reinforce the power of profession in the social structure through the monopoly of income and occupational status and license. Although the mechanisminferenceare different, both functionalism and conflict theory consider the control power of professionals in their relationship with clients [2], but possible actors holdingthe control power other than professionals are not taken into consideration.

The power relationship between professionals and clients is further discussed in more details by Johnson [5]. He interprets the relationship between the professionals and the client as a production-consumption relationship, and defines three control modes: collegiate control, patronage control, and mediation control. In a collegiate control relationship, the professionals' expertise dominates the production-consumption process, and professionals can defineclient needs and determine how client needs are met. By contrast, in a patronage control relationship, the clients definetheir own needs and determine how the professionals meets these needs. In the mediation control relationship, there is a third party (usually the state or government) playing the role of regulating professionals and clients, and determines the content of the production-consumption relationship. Johnson's theoretical framework addresses that in the relationship between professionals and clients, controlling power may notpossessed by professionals, and the client's control power and influence on professional services is recognized. Further drawing form the concept of agency theory, Sharma [6] proposes four restraint modes for clients (i.e. principal) to avoid the opportunistic behavior of professionals (i.e. agents) in the relationship between the two parties: self-control, community control, bureaucratic control, and customer control. In his propositions, professional service providersare probably subject to client control when (1) there are alternative internal or external channels for the clients to obtain relevant knowledge, such as the same service is provided by other suppliers in the market; (2) the competition environment or institutional context allows clients to require professional service providers to invest assetsspecific to the transaction, such as developing professional capabilities to meet the client's special needs; (3) the professional service provider's transaction with the client associates to the same service at different time points, or to other service of different content, such as an accounting firm also providesregular consulting services. Based on similar concept, Leicht and Fennellfirst proposed the term "client capture", which is defined as 'the context in which clients become so important to the professionals serving them that they lose the professional independence that is presumed by the profession to govern the relationship' [7]. They indicate that in the case of clients weakening professional authority and status, professionals are "captured."

The relationship between professional service providers and clients becomes more complex as clients become more influential [8] [9]. The clientspurchasing professional service have the ability to control the activities, processes and expenses of the professional work. As such, the service provided by professionals may not comply with the professional standards, but is in line with the client's certain objective and the commercial interests of the professionals.Professionals may thus lose their autonomy and independence, thereby weakening their role in protecting the public interest.

Although the client capture may result in great impact, priorstudies on client capture are limited. The main stream is to explain the mechanism shaping client capturebased on interview data [10]-[12].In other words, these studies investigate the intrinsiccausesthat may influence therelationship between professionals and their clients. Nevertheless, Malhotra and Morris [13] generalize the nation of client capture as one of the factors bring about the heterogeneity among professions,implying that extrinsic causes such as institutional arrangement may initially embed client capture in the professional practices. In the following sections, external causes of client capture will be discussed and empirically demonstratedinthe context of patent filing services.

III. HYPOTHESES

Customization is one of the most representative features of professional services [14]. Further to professional capabilities such as experience and expertise, the services provided by a professional also diverges depending on the client's need, the "raw material" given by the client, and the context of the service provided. In order to protect the public interest and to avoid damage onclients due to information asymmetry, the government usually sets minimum standards to ensure the quality of professional services. For example, occupational license is a common way to screen who can legally provide professional service. In addition, legal regulations usually place restrictions on the content and outcome of professional services. While the degree of legal restrictiongoes higher, the degree of customizationof professional services diminishes, and,consequently, the degree of client capture may raise.

After a patent application is filed, the applicant will obtain the patent only if the application meets the requirements set in the patent law. In practice, non-obviousness or inventive-step among others is the most important patent requirement. Non-obviousness of an invention reflectsinventiveness of thetechnologyseeking fora patent. Generally, the higher the degree of innovation, the higher non-obviousness, and the higher possibilitya patentwill be granted. Although the patent lawsstate a number of patent requirements, non-obviousness receivesthe most attention because obviousness is the major reason most patent applicationsbeing rejected. In other words, the most common reason failure to obtain a patentis that the claimed invention is not sufficiently innovative. In

contrast, the patent lawsset fewer requirements with regard to the writing of claims. Although claims in a patent application are required to be properlydisclosed, the disclosure requirement relates to how claims should be drafted (i.e. claim language) and not to the number of claims.

In the patent filing service, accordingly, patent law firms have very limited influence on the patentability due to the legal requirements stem from patent law, particularly the technological innovativeness. However, patent law firms have a relatively large flexibility in the writing of patent claims. This allows patent law firms to differentiate from othersby means of, for example,their experience and expertise.Therefore,

H1: In patent filing service, client capture is strongerin patent granted rate than in number of claims.

Further to the influence of the applicant's technical innovativeness, the applicant's strategy of patent filing quality also drives the variance of patent granted rate. In modern patenting activities, the function of patents has been extended fromsimply exclusive rights (preventing competitors from imitating) to strategic patenting (achieving maximum profits through any possible approaches). When the effectiveness and the need of patents increases, applicants will strategically adjust the innovative level of which they are willing to file patents for their technology, in order to obtain more weapons or bargaining power. For example, technology companies in a patent-competitive environment where patent is more necessary may file a patent application for its R&D output even less innovative, i.e. less likely to obtain a patent. This will lead to greater variation in patent granted rates among different applicants, and reduce the variancecontributed by patent law firms in correspondence.

However, not all types of applicants engage in strategic patenting. In contrast to for-profit applicants (defined as private companies in this study), most of the non-profit applicants (defined as research institutions and universities in this study) file patents simply for protecting their R&D output and getting academic credits. Since strategic patenting is not taken into consideration, the variance of innovativeness of non-profit applicants' technologies for patenting will be lower than those of for-profit applicants, and thus reduce the degree of client capture. Therefore

H2: In patent filing service, client capture is stronger in patent granted rate offor-profit applicantthan that ofnon-profit applicant.

The characteristic of customization means that output of professional services will vary for different clients and different needs. During the process of providing customized services, professional service providers propose a variety of different solutions, depending on the situation at the time and the needs of clients, and eventually select the most appropriate one. Accordingly, the professional service providers who is able to propose more candidate solutionswill likely toprovide a more appropriate service outcome form the solution portfolio. Suchcompetenceofcreating diversity of possible solutions help firms to differentiatefrom others in termsof performance and service quality. That is, if the possible solutionsproposed bya professional service provider are limited in essence, differentiation between professional service providers will not be remarkable.

Patent claimsareconsist of languages, which describe the technical content by text and serves as the basis for defining the scope of patent rights. Although the patent requirements is generally consistent across different technologies, claim writing of patent applications may vary depending on the technical field.From the perspective of claim writing, different technical fields involve different textual diversity or flexibility. In the technical field which is less codified (such as electronics and machinery), claim writingembrace greater variability, while the technical field which is highly codified (such as chemistry) is more standardized. Therefore,

H3: In the service of claim drafting for patent filing, client capture inless likely to occur in lesscodified technology than highlycodified technology.

IV. DATA AND METHOD

The outcome and quality of professional service is difficult to measure. However, patent filing service provides a good context in which service outcome can be quantitatively proxied. The data used in this study is the Taiwan patent applications applied from 2003 to 2010.Taiwan patent data has the following major advantages: (1) Taiwan has a high number of patent applications per capita and thus provides sufficient samples; (2) Patenting procedure in Taiwan is relatively simple. For example, Taiwan is not a member state of PCT and therefore does not need to consider applications for the PCT route [15], and nor does Taiwan have special application procedures such as the continuation application in the US patent system [16].(3) All the patent agents recorded in the Taiwan patent dataare external patent agent or patent attorney, and thus there is no need to distinguish between internal agents(i.e. those hired by the applicants) and external agents [17]. (4) All of the patent law firms in Taiwanareoperated in the form of unlimited liabilitypartnership, so there is no need to consider the possible impact differences form different organizational forms of professional service

providers [18].

In order to separate the impactsfromthe applicants and from the patent law firms on the patent granted rate and the number of claims, this study usesvariance component analysis (VCA)to estimate the contributions to the service outcome from the applicants and the patent law firms respectively. VCA is based on the random effect model, which decomposes the variance of the variables to be analyzed into the variances of different components, and then numerically estimates the weighting of the variance of each component of the variable to be analyzed [19]. An important application of VCA in previous researches was to estimate the respective impact on revenue contributed by the company and by the industry (for a review, see [20]). The VCA model used in this study is:

$$Y_{ijkl} = \mu + \alpha_i + \beta_j + \gamma_k + \delta_l + \alpha\beta_{ij} + \alpha\gamma_{ik} + \epsilon_{ijk} \quad (1)$$

wherein:
Y_{ijkl} stands forthe variance of patent granted rate or number of claims, of the i-th applicant'sapplication, filed by the j-th patent law firm, in the k-th year, and in the l-th technical field;

$\alpha_i,\beta_j,\gamma_k,\delta_l$arethe variance components contributed by the i-thapplicant, thej-thpatent law firm, thek-thyear, and the e l-thtechnical field, respectively;

$\alpha\beta_{ij},\alpha\gamma_{ik}$ arethe variance components contributed by the joint effects of the i-th applicant and the j-patent law firm, and the i-applicant and the k-th year, respectively;

$\mu$is the constant and ε_{ijk}: is the error.

Fig. 1illustrates the data structure of this study for VCA in equation (1). Since each applicant may file patent applicationsthrough more than one patent law firmand each patent law firmmay have more than one client applicant, the patent data is organized into an unbalanced data structure as shown in Fig. 1, in which each greyed block represents a sample of the patent applications filed by the i-th applicant through the j-th patent law firm in the k-th year and the l-th technical field.Then, patent granted rate and average number of claims. The VCA process is performed in SPSS software.

V. RESULTS

Table 1 shows the VCA result of patent granted rate and number of claims. As seen from Table 1, the impact of the patent law firm on number of claims (16.55%) is greater than the impact on patent granted rate (0.03%). That is, in the patent filing service, client capture embedded in patent granted rate is stronger than that in number of claims, and thus supports H1. In fact, patent granted rate is hardly influenced by the patent law firms, suggesting that whether a patent application will be granted or not may dependent only on the applicant. Nevertheless, the contribution of the joint effect of the applicant and the patent law firm to patent granted rateis about 3%, implies that different combinations of an applicant and the a patent law firm still have little but non-zero differentiated effect on patent granted rate.

Dividing the applicants into for-profit and non-profit applicants, Table 2 shows the VCA result of patent granted rate. The result generally supports H2. Although the impact on patent granted rate of patent law firms have no substantial difference between the for-profit applicants (0.06%) andthe non-profit applicants (0.00%), the variance component of applicants is larger in the group data of for-profitapplicants (36.36%)compared to that of non-profitapplicants (28.53%). As explained above, due to the difference tendency in strategic patenting behavior, serving for-profit applicants will be subject to stronger client capture with respect to patent granted rate. In addition, the component of joint effect of applicants and year also provides an evidence of strategic patenting behavior.For-profitapplicants may modify patenting strategy over time depending on,for example,variedbudget, industry competition, orcurrent size of patent portfolio, resulting patent granted rate varies at different year and contributing about 12% variance of patent granted rate. By contrast, the impact on patent granted rate form the joint effect of non-profit applicants and year is approximately zero. Table 3 shows the VCA result of number of claims with respect to three technical field: electronics, machinery, and chemistry. In the patent applications relating to electronics and machinery, the patent law firms have greater contributions to the number of claims (23.49% and 33.59%, respectively) than that in the patent application relating to chemistry (20.21%),suggesting thatpatent drafting service suffers greater client capture embedded in highly codified technical fields than less codified technical fields. Therefore, the result support H3.

DISCUSSIONS

To the author's knowledge, there was no empirical evidence of client capture presented in priorliteratures. This study provides an empirical evidence of client capture based on patent data with the aid of variance component analysis. The findingssuggest that extrinsic factors such as legal restrictions, strategic preference of clients, and differencesamong industries result in varied level of client capture embedded in the context, encoring the concept of mediation control elaborated by Johnson [5].

The VCA result in Table 1 shows that there is significantly different level of client capture in connection with patent granted rate and number of claims in patent filing services. In practice, patent granted raterefers tonumber of patent obtained(i.e. quantity), and number of claims refers tovalue of patent values (quality). In most ofprior studies using patent data, an unspokenassumptionis that patent law firmsdo not contribute to the outcome of patent grant, so that patent can serve as a variable of certainorganizational characteristics, such as innovation capability.The findings of this study, however,suggest that although patent law firms have no impact onobtaining a patent, theydocontribute to the value of a patentthroughclaimdrafting. In other words, if the quality,in particular the numbers of claims, of the patentis used as a measure of certain characteristic of the applicant, ignoring the effect of patent law firms may lead to problematic results.

In addition, different levels of client capture imply that professionalswill have correspondingly different degrees of autonomy. Combined with the findings of this study, it is suggested that extrinsic factors will lead to varied client capture, which will in turn influence the autonomy of professionals. Since professional services have the function of assisting the operation ofinstitution, the government could appropriately design legal regulations for professional services in the light of different policy objectives. For example, in many countries the patent system is inefficient due to the backlog of the patent applications and impaired quality of patent examination. If the client capture of patent filing services can be reduced throughallowing more flexibility and responsibility of patent agentsand patent attorneys in patent filing services, the professionals will have stronger power to play the role of gatekeeper for patent quality. On the other hand, if the policy makers believe that the quality and value of a patent should be independentfrom the work of professional patent services,more restrictions may need to be placed on claim drafting.

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Year k, technical field l	**Applicant 1**	**Applicant 2**	**Applicant 3**	**Applicant 4**
Patent law firm 1	**Sample(1,1)**			**Sample(4,1)**
Patent law firm 2	**Sample(1,2)**	**Sample(2,2)**	**Sample(3,2)**	
Patent law firm 3	**Sample(1,3)**			**Sample(4,3)**
Patent law firm 4		**Sample(2,4)**		**Sample(4,4)**
Patent law firm 5	**Sample(1,5)**			**…**

Fig. 1 Data structure for VCA

	Patent Grant Rate	Number of Claims
Applicant	0.3624	0.4637
Patent law firm	0.0003	0.1655
Technology	0.0497	0.0101
Year	0.0839	0.0012
Applicant ×Patent law firm	0.0287	0.0657
Applicant ×Year	0.0959	0.0869
Error	0.3791	0.2069

Table 1 VCA result

	For-profit Applicant	Non-profit Applicant
Applicant	0.3624	0.4637
Patent law firm	0.0003	0.1655
Technology	0.0497	0.0101
Year	0.0839	0.0012
Applicant ×Patent law firm	0.0287	0.0657
Applicant ×Year	0.0959	0.0869
Error	0.3791	0.2069

Table 2 VCA result of patent grant rate

	Electronics	Mechinery	Chemistry
Applicant	0.1409	0.1639	0.2173
Patent law firm	0.2349	0.3359	0.2021
Technology	0.0332	0.0116	0.0206
Year	0.0000	0.0000	0.0196
Applicant ×Patent law firm	0.0657	0.1442	0.0417
Applicant ×Year	0.0816	0.0000	0.1701
Error	0.4436	0.3443	0.3285

Table 3 VCA result of number of claims

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