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Performance Implications of Diversification in Professional Service Firms: The Role of Synergies

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Abstract

There is growing interest in the Professional service firms because they are seen as archetype of the knowledge-based economy. In this study we look at under researched area of exploitation of synergies in professional service firms and its implications for performance. Overcoming the uni-dimensional nature of extant studies, we examine the performance implications of diversification along the twin dimensions of services they offer and the knowledge of the industry domain of their clients. We hypothesize that moderate levels of coherence in these dimensions lead to improved performance while excess coherence in these domains lead to diminished performance. These predictions are tested and supported by data from the Indian IT industry which is synonymous with emergence of knowledge economy in India. Our study thus contributes to the theory of diversification of professional service firms.

Keywords: Professional Service Firms, Coherence, Synergies, Indian IT Industry, Information Asymmetry

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INTRODUCTION

Research in strategic management has widely explored the relationship between diversification and performance (Rumelt, Schendel et al. 1994). Notions of relatedness, synergy, core competence and corporate coherence continue to dominate research in strategy. Studies have argued that economies of scope (both in a static and dynamic sense) as well as complementary resources underpin these conceptual notions. However, empirical evidence does not conclusively prove the superiority of related diversification strategy over unrelated diversification strategy (Ramanujam and Varadarajan 1989; Hoskisson and Hitt 1990; Montgomery 1994). Numerous studies have found support for the superiority of related diversification over unrelated diversification (Rumelt 1974; Markides and Williamson 1996) whereas equally significant number of studies has found no relationship between diversification strategy and performance(Grant, Jammine et al. 1988). Further, most studies which examined the diversification performance relationship focused at an inter-industry level. Few studies focused on this relationship at an intra-industry level(Stan Xiao and Greenwood 2004). Fewer studies have looked at issue of diversification in professional service firms. The extant theories cannot be used for examining diversification in professional service firms because they are predominantly uni-dimensional. Professional service firms however involve integrating knowledge in at-least two dimensions: knowledge about the services they provide to the clients, knowledge about the client's industry. These two along with the knowledge about the client help in customizing the solution which is the hallmark of professional service firms. A study of diversification of these firms hence would be incomplete if looked at only from the point of view of services or industry domain.

This study uses the setting of the Indian IT industry. which has become an important part of the Indian economy with contribution to GDP growing five times from year 1998 to 2010 to reach 6.1%, and contributes to the within industry diversification and professional services firm literature by examining the performance implications of diversification across both range of services and industry application dimensions. The IT industry in India has evolved from providing on-shore services to offshore services and now to services distributed across various geographies. In terms of diversity offered, IT service firms has evolved from providing application, development & maintenance services to Business process outsourcing (BPO), engineering & industrial services and infrastructure services to its clients worldwide across a variety of industries such as banking, retail, financial services, insurance and manufacturing. As the industry further evolves, the pertinent question that the managers pose is whether diversification (especially related diversification moves) across

specializations (range of services offered) or across industry applications or both contribute towards performance.

We show empirically that related diversification strategy is relevant across specializations rather than industry applications within the Indian IT industry. The study also shows how quality certification helps firms in overcoming information asymmetry with its potential clients or customers leading to a better performance. Additionally, we extend the theoretical contribution by showing that there are limits to exploitation of synergy across specializations by firms.

THEORY AND HYPOTHESIS

Organization theorists consider Professional service firms to be different from other organizations because of extreme intensity of knowledge required for their operation (Greenwood et al., 2006; Lowendahl, 2000; Teece, 2003;). Von Nordenflycht (2010) uses distinctive characteristics of knowledge intensity, low capital intensity and professionalized workforce to develop taxonomy of Professional service firms with varying degrees of professional service intensity. In our study we focus on Neo PSF's which are characterized by High human capital intensity, lower capital intensity and weakly professionalized workforces. The importance of this class of Professional service firms cannot be underemphasized. One of the classes of such firms which constitute the Indian IT industry are estimated to contribute about 6% of India's GDP and about 26% of exports in the year 2010 (Nasscom Strategic Review, 2010). These are different from classic PSF's like law and accounting firms which have a professionalized workforce featuring professional associations and self regulations (Von Nordenflycht, 2010). In addition the professional service firms we are referring to also have a high element of customized solution which Von Nordenflycht (2010) subsumes under knowledge intensity. The customization of solution adds an interesting dimension of the deep knowledge of client's operations which complements expert services provided by the professional service firms and the knowledge of the client's industry to command high professional service intensity. In case of the Indian IT industry, a software service provider combines the knowledge of client's industry and client's business practice to provide customized services. A diversification in this case could either mean diversifying across the range of services or diversifying across industry verticals or both. For example a firm offering ERP solutions in the banking domain could either expand along service lines by adding Datawarehousing solution to its banking clients or along industry verticals by offering ERP solutions to say clients in Oil and Petroleum Industry or both. The question of which of these diversification paths can lead to better performance cannot be addressed using the extant studies because most of the studies consider diversification only along one dimension. Even within industry diversification studies consider only one dimension. While these might be valid in the case other firms, such an approach is ill equipped to yield reasonable insights in case of professional service

firms like Software service providers. One reason for such uni dimensionality in existing empirical studies could be the overriding focus on law and accounting firms. In case of professional service firms which we focus on, one cannot talk about the professional services decoupled from the industry to which the services are meant for. This is a significant gap in the emerging but important research area of Professional service firms which we purport to fill.

PERFORMANCE IMPLICATIONS OF SYNERGIES

Several studies have pointed out why related diversification leads to better performance. Diverse reasons have been ascribed for this relationship. Most of these arguments stem from resource based view of the firm (Penrose 1959). For the purposes of this study, we use term the "coherence" coined by Teece et.al (1994) for understanding the role of synergies between firms' activities. Teece et. al (1994) argue that the firms are coherent to the extent that the constituent businesses or market niches are related to one another. Firms have an incentive to diversify because it helps in exploiting benefits from excess supply of a resource (Teece 1982). Given the varying degree of similarities among market niches in the Indian IT industry (i.e., across specializations and industry applications), firms in the IT industry can exploit static economies of scope (resource based synergies) across specializations or industry applications or jointly across specializations and industry applications. The firms cannot use this excess capacity of resources by subcontracting them because they are usually firm specific and cannot be used outside the firm due to its imperfect indivisibility (Wernerfelt 1984; Barney 1991; Markides and Williamson 1996). As a result, sharing of resources across different markets or market niches within an industry leads to an overall reduction in costs and thus better performance of firms.

However, Foss and Christensen (2001) argue that this conceptualization of synergies or relatedness due to economies of scope is quite narrow and is not a good measure of synergy. Coherence is the ability of firm to discover potentially profitable combinations of various types of assets, where the combination of assets is based on some complementarity. The concept of coherence or relatedness thus includes dynamic complementarities i.e., doing an activity increases return from another activity (Milgrom and Roberts 1995). Experimentation, learning, flexibility, commonality, path dependency and market structuration can lead to synergies and coherence(Teece, Rumelt et al. 1994; Foss and Christensen 2001). Market niches initially appear as tentative opportunities for firms. As firms experiment with a few opportunities, this would not lead to learning at both intra and inter-firm levels(Baum, Li et al. 2000; Ingram and Roberts 2000). Experimentation by a number of firms in the same market niche would lead to establishment of support structures for the market niche (Saxenian 1994). The emergence of support structures for firms to efficiently exploit these market niches would lead to legitimization of market opportunity. In essence, the market niches would mature through the process of structuration(DiMaggio and Powell 1983). Infact, studies argue that relatedness of market

niche increases with an increase in number of firms operating in the same market niche (Stan Xiao and Greenwood 2004). Consequently, we hypothesize

Hypothesis 1a: Greater coherence across specializations would lead to better performance of firms

Hypothesis 1b: Greater coherence across industry applications would lead to better performance of firms.

Subsequently, over a period time, there can be some market niches which can be over legitimized and thus would face some administrative costs. Further, Teece (1982) suggests that using common resource bases across a range of activities can lead to poorer performance of firms due to congestion. Li & Greenwood (2004) argue that this congestion is expected to be lower at an intra-industry level than at an inter-industry level because of similarities across customer groups and input factors. Attempts by firms to leverage the same resources (absence of organizational slack) for increased number of activities may probably lead to overstretching and thus could lead to poor performance despite commonalities between market niches. This would also mean that there are no resources and opportunities available for experimentation. Coherence is a tradeoff between flexibility and diversity of the firm on one hand and commonality on the other hand(Loasby 1983; Foss and Christensen 2001). Thus, firms make a tradeoff between experimentation and exploitations and corporate coherence is the capacity of the firm to make a favourable tradeoff. Accordingly, we hypothesize

Hypothesis 2a: Excessive coherence among specializations leads to negative effect on performance of firms

Hypothesis 2b: Excessive coherence among industry applications leads to negative effect on performance of firms

Professional service firms output is such that clients "cannot judge the expert's advice or reports on substance" (Starbuck 1992, p. 731). Their output is hence characterized by information asymmetry (Nayyar, 1990) or quality opacity (Von Von Nordenflycht, 2010). The clients are dependent on the professionals delivering the services and hence the onus is on the professional service firms to convince clients of their superior competence (Greenwood et al, 2005). In case of software service firms the difficulty to ascertain the quality of service is compounded by intangible nature of the services as well as simultaneous production and consumption of these services. This leads to buyers having less information regarding the quality of service than sellers. Hence the firms use "social proofs" of competence such as certifications by independent agencies (Rao et al, 2001). This leads to a reduction in information asymmetry but not its elimination. Accordingly, we hypothesize

Hypotheses 3: Certification among IT firms would lead reduction in information asymmetry and thus leads to better performance of firms

DATA, MODEL AND MEASURES

In order to investigate the relationship between coherence or synergies, certification and performance in Indian IT services industry, data is taken from the 2002 published directory of National Association of Software and Service Companies (NASSCOM), the leading trade organization of Indian IT industry. 854 IT firms were members of NASSCOM as on 31st December 2002. The combined revenues of NASSCOM member firms contribute to almost 95% of the revenue of IT industry in India. Information is available on specialization and industry application for 675 companies out of which 94% have mentioned both specializations and industries. The directory also provides information on number of employees, markets covered, exports, revenues, certifications and location details.

Estimation Model

The hypothesis developed above is testing using the following model

$Revenues_{i,t} = \beta_0 + \beta_1 (CMM\ Certification_{i,t-1}) + \beta_2 (Coherence\ specialization_{i,t-1}) + \beta_3 (Coherence\ industry\ application_{i,t-1}) + \beta_4 (Coherence\ specialization_{i,t-1})^2 + \beta_5 (Coherence\ industry\ application_{i,t-1})^2 + \beta_6 (age_{i,t-1}) + \beta_7 (Size_{i,t-1})$

where i refers to a specific firm, and t a specific year.

Measures

Revenues: Coherence or synergies as well as diversification to exploit information asymmetry among professional service firms are hypothesized to impact performance for firms i.e., either in terms of growth in revenues or productivity. A number of studies have chosen revenues as a measure of performance.

Certification: Similar to other studies, we have used CMM certification to capture differences in information asymmetry between firms and its potential customers. As part of this study, CMM certification is measured as a binary variable and it equals 1 if a firm has a level 3 or above certification and 0 otherwise.(Gao *et al.*, 2010; Keeni, 2000)

Coherence across specializations and industry applications: Most of the studies in itner-industry diversification use industrial classification for measuring relatedness. However, there is no consensus about relatedness of market niches (Davis et al, 1992, Stimpert and Duhaime, 1997, Pehrsson, 2006). Survivor based measure of relatedness is chosen for the purposes of this study (Teece *et al.*, 1994). This measure is based on the observation that firms do not combine businesses at random. This measure also has the advantage that the observed tendency of relatedness encompasses all the measurable and immeasurable synergies, prevalence of combinations can be taken as evidence of

relatedness or synergy and poor decisions would be screened out in the competitive environment (Zuckerman, 2000). More importantly, it is based on manager's conception of business rather than any classification system.

Managers from the IT industry conceive their business in terms of its industry applications and specializations. One can observe these in disclosures of annual reports, newspaper reports on mergers and acquisitions, where reporting is done in terms of specializations or industry applications. Industry applications are also known as verticals or different user industries such as Banking, Retail, Insurance, etc. Specializations are also known as horizontals and would include IT consulting, application development, embedded software, engineering services, etc. Thus, the business of IT firms consist of two dimensions i.e., industry applications and specializations. We compute survivor based measure of relatedness for both industry applications and specializations.

The relatedness index between specialization i and j was measure as follows
Let us consider a population of K diversified firms and define the following variables:
C_{ik} = 1 if firm k is active in industry i and 0 otherwise;
$n_i = \sum_k C_{ik}$ and $n_j = \sum_k C_{jk}$ are the number of firms k active in industries
i and j , respectively;
$J_{ij} = \sum_k C_{ik}C_{jk}$ is the number of firms simultaneously active in i and j with
$0 < J_{ij} \leq \min(n_i, n_j)$.

A measure of inter-business relatedness is obtained by comparing the observed J_{ij} with the number of links that would emerge from random diversification. The latter can be calculated through the hyper-geometric random variable X_{ij} . After having extracted without replacement from a population of K firms two samples n_i and n_j , the probability to find x firms operating simultaneously in i and in j is the following:

$$\Pr(X_{ij} = x) = \frac{\binom{n_i}{x}\binom{K - n_i}{n_j - x}}{\binom{K}{n_j}}$$

The mean and variance of X_{ij} are respectively:

$$\mu_{ij} = E(X_{ij}) = \frac{n_i n_j}{K}$$

$$\sigma_{ij}^2 = \mu_{ij}\left(1 - \frac{n_i}{K}\right)\left(\frac{K - n_j}{K - 1}\right)$$

The index of relatedness is constructed by comparing the observed value of *Jij* with μij , and scaling the difference with the standard deviation of *Xij* :

$$SR_{ij} = \frac{J_{ij} - \mu_{ij}}{\sigma_{ij}}$$

Coherence measure is an average of relatedness scores (Teece *et al.*, 1994). To compute coherence at the firm level, we use the relatedness index computed separately for specializations and industry verticals and computed as unweighted mean of relatedness scores across specializations and industry applications for each of the firms in the IT industry.

$$COH_{AVG} = \frac{\sum_{j \neq i} SR_{ij}}{m}$$

where m refers to the number of specializations or industry verticals in a firm and SRij refers to the relatedness index computed above.

Control Variables: Size of the firm is expected to have an influence on the performance of firm. Besides, firm size can also influence synergies since large firms are expected to have extensive product lines. These firms can exploit more synergy opportunities as well as suffer from managerial diseconomies. Thus, we control for firm size as part of this study through Nof of employees. Age is also supposed to impact firm diversification moves and performance. Thus, we control for firm age as part of this study.

To facilitate comparison of coefficients, all independent variables are measured in standardized units.

RESULTS

Table 1 displays the means, standard deviations for all variables. All bivariate correlations are lower than 0.47 except the correlation between horizontal coherence and its square and between vertical coherence and its square term. Such a level of correlation between a variable and its squared term is common in empirical studies (Aiken and West 1991).Though estimates will not be biased due to such a high level of correlation, the standard errors may be high. To ensure that this problem does not arise, we looked at the collinearity diagnostics using Variance inflation factors and our decision rule was that maximum VIF should be less than 10 (Neter et al, 1990) The highest VIF is 6.79 which indicates that there is no evidence of multicollinearity.

Table 1 Descriptive Statistics and Correlations

		Mean	Std Dev	1	2	3	4	5	6	7
1	Certification	0.17	0.38	1						
2	Age	13.80	108.01	-0.01	1					
3	Employees (2002)	470.95	1371.92	0.47*	0.01	1				
4	Export Intensity	87.56	71.88	-0.02	0.01	0.00	1			
5	Horizontal Coherence	3.04	1.13	0.02	-0.02	-0.02	0.03	1		
6	Vertical Coherence	2.79	1.34	0.03	0.01	0.04	0.00	0.06	1	
7	Horizontal Coherence squared	10.55	8.83	0.01	-0.02	-0.03	0.04	0.90*	-0.07	1
8	Vertical Coherence squared	9.58	8.24	0.02	0.00	0.01	-0.01	0.02	0.89*	-0.03

N = 342 Note. ∗p<0 05.

Table 2 presents the results of our regression analysis. The regression estimates incorporate classic correction for heteroscedasticity i.e. HC0 estimator proposed by Huber (1967) and White (1980). Two models are shown. Model 1 shows results of regression with all firms in the sample. Model 2 shows the results of regression with the top 5 firms by revenues excluded.

Table 2: Regression results

Dependent Variable – Revenues	**Model 1**	**Model 2**
	All firms	Excluding Top 5 firms
Intercept	0.028	0.155
Certification	-0.157**	0.224*
Age	0.003	0.006***
Employees (2002)	1.001***	1.851***
Export Intensity	0.008	0.016
Horizontal Coherence	0.045**	0.111***
Vertical Coherence	-0.023	-0.063
Horizontal Coherence squared	-0.039**	-0.094***
Vertical Coherence squared	0.024	0.075
R-Squared	0.95	0.75
Adjusted R-Squared	0.94	0.74

N = 342: *p < .10, **p < .05, ***p< .01

While Certification is significant but negative in model 1, it is positive and significant in Model 2. Age is not significant but is positive when the top 5 firms are excluded. No of employees is positive and significant in both models. Horizontal coherence is positive and significant in both models while

vertical coherence is not significant. The square terms for horizontal coherence are negative and significant for both models, while square term for vertical coherence is not significant.

DISCUSSION

Our analysis shows that greater coherence or synergies across specializations contribute to the performance of firms, whereas greater synergies across application industries do not contribute to the performance of firms. One of the reasons could be the sale of multiple specializations to a single client i.e. firms in the IT industry are diversifying and selling a wide range of services to the same client. Besides, presence of friendship networks or social capital among clients in the same industry helps firms sell a wide array of services leading to greater synergies and thus greater synergies across specializations. Consequently, coherence across IT specializations not only leads to a reduction in costs but also achieves complementary returns across multiple specializations due to cross-selling opportunities. Although, there might be reduction in costs across industry application, the possibility of achieving complementary returns is quite limited across industry applications. The results are consistent with other studies which show that related diversification affects performance (Stan Xiao *et al.*, 2004).

Our analysis also shows limits to exploitation of coherence (across specializations) by firms. One of the probably reasons could be that the firms are not able to exploit synergies due to greater competitive penetration across these niches (Tanrivedi *et al.*, 2008). In addition, higher synergies could also mean lack of sufficient experimentation by this section of the firms leading to reduced performance. These market niches are not only legitimized but over-legitimized leading to a significant bargaining power for both clients and employees (and thus adding to the costs). Besides, firms may not have the necessary organizational slack to achieve higher performance and resources may be over-stretched (Gary, 2005).

Additionally, the results (for the overall sample) show that certification impact performance negatively. In order to check the stability or robustness of this result, we also analyzed the impact of removal of top five firms from the sample. Although, the signs of the other results broadly remained the same, the sign of certification changed from negative to positive. This shows that smaller firms do probably need certification to overcome information asymmetry barriers in the IT services industry in India. Besides, large firms are probably established brands in themselves and thus certification may not add value to the performance. However, negative sign on certification is counter intuitive. One of the probable reason could be that certification is measured as a a binary variable i.e., firms having CMM certification level 3 and above as 1 and others as 0. This could have lead to the negative sign.

Large firms probably have better certification levels and this actually helps them sufficiently differentiate among their clients.

Consistent with other studies, economies of scale contributed towards performance of firms whereas age did not contribute to the performance of firms. Besides, the results show age of a firm contributes towards performance of small firms. Comparisons of the magnitude of standardized coefficients show that scale economies have the highest impact on performance for firms in the Indian IT industry. Besides, scale economies have a higher impact on reduced sample (i.e., removing top five firms) than the overall sample. This shows that top five firms are probably moving away from scale economies to building up capabilities as well as reaping benefits from those capabilities. This is also broadly consistent with results from another study which shows that the relationship between capability and performance is not automatic (Basant *et al.*, 2006).

Among certification and average horizontal coherence, the results show that certification has a higher magnitude of impact in the reduced sample. Smaller firms are able to leverage certification (by overcoming information barriers) better than synergies across market niches. Further, the results also highlight that smaller firms are able to better leverage synergies across specializations while the non-linear role of synergies is greater among the smaller firms. One of the probable reasons could be existence of a threshold beyond which synergies do not matter for firms.

CONCLUSION

It is quite well known that firms in the same industry differ by variety of products or services delivered to its clients. All the firms do not offer the same variety of products. However, the current level of theorization to determine the scope of the firm at an inter-industry as well as intra-industry level remains equivocal. In this paper, an attempt is made to understand the role of synergies in the presence of information asymmetry on performance of firms in the Indian IT industry. While the paper highlights the non-linear nature of diversification per se, it attempts to extend the theory by empirically validating the non-linear nature of related diversification. In attempting the same, it captures the unique nature of IT services industry by measuring synergies at two levels i.e., industry applications and specializations. Our study thus contributes to the diversification literature by overcoming the uni-dimensional bias in the existing studies. To the best of our knowledge only Nayyar (1992) and Tanriverdi and Li (2008) have explored the implications of diversification across more than one dimension. We have also contributed to the empirical literature on Professional service firms by looking at industries other than law and accounting firms. Our study is also one of the few studies which captures coherence or synergies using managers' conception of business rather than any industry classification. This study tries to capture the dynamic process of market structuration,

experimentation and legitimization of market opportunities using survivor measure of relatedness. However, owing to the cross-sectional nature, this study does not capture market structuration and legitimization over time. Additionally, the study does not measure inter-temporal economies of scope(Helfat *et al.*, 2004). Further, it was observed that competitive penetration affects both diversification and related diversification. This study does not capture the affect of multi-market multi-product competition on the relationship between scope of the firm and performance(Tanrivedi *et al.*, 2008). Future research can attempt to integrate these ideas to further advance the theory on scope of the firm at an intra-industry level.

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