Network embeddedness, specialization choices and performance in investment banking industry

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Abstract

The idea that network structure and embeddedness affect firms' competitive behavior and performance is not new both in network literature and in strategic management literature. This study recognizes that the possibility to fully exploit network opportunities is depending on firm specialization choices.

By analyzing network embeddedness within the European investment banking industry, I find that banks enhance performance by having a central position in their network and that specialization reduces bank's benefits of having a central position in the network.

INTRODUCTION

The idea that network structure and embeddedness affect firms' competitive behavior and performance is well acknowledged both in network literature (Uzzi, 1997; Burt, 1992; Coleman, 1988; Granovetter, 1973) and in strategic management literature (Gnyawali, He, and Madhavan, 2006; Hagedoorn et al., 2006; Echols and Tsai, 2005; Zaheer and Bell, 2005; Gnyawali and Madhavan, 2001; Gulati et al., 2000; Gulati, 1999; Cravens et al., 1996). There is substantial agreement for treating networks as a source of external resources upon which the firm can draw in its strategic actions and enhance its performance.

In considering performance-related outcomes great attention has also been paid to important features of ties, or relationships, within networks (Cross and Cummings, 2004; Adler and Kwon, 2002; Higgins and Kram, 2001; Monge and Contractor, 2001). What is suggested is that one of the most important mechanisms for increasing performance is firms' ability to use network ties for accessing information about opportunities and choices that are otherwise not available to them. However, analyzing performance at the firm level, literature has considered firms' strategic resource endowments (Peteraf, 1993; Barney, 1991; Teece et al., 1991). From this point of view, each firm is idiosyncratic because of differences in resources and assets acquired over time and because of the routines developed to manage them. If a favourable position in the network gives the firms the potential to access the information on the existence of diverse opportunities, the possibility to fully exploit these opportunities is depending on the presence of some firm-specific characteristics (Shipilov, 2006; Lee et al., 2001).

According to Cohen and Levinthal's (1990) "absorptive capacity" concept, firms' ability to get knowledge and information from their external environment is a function of the firms'

specialization choices and experiences. In particular, firms operating in many market segments are likely to possess more internal capabilities than firms operating in few market segments since, as the volume and complexity of information in the environment increase, the organization needs to have correspondingly high levels of information processing capacity (Miller and Chen, 1994; Hambrick, 1982; Khandwalla, 1973). Implicit in this arguments there is the question: "Have all firms the same possibility to benefit from a favourable network position?".

In sum, this study points the fact that simply having access to information about the existence of business opportunities is not sufficient to permit their exploitation without the possibility to use this information, due to the lack of internal capabilities.

Based on these considerations I attempt to investigate how network position can influence performance of firms and how firm-specific characteristics can mediate this relation by asking: "Does network position influence performance of its members?" and "How specialization choices could influence this network position – performance relation?".

I examine these aspects studying network position and specialization of actors operating in the investment banking industry in Euro area, using data on syndicates formed by 78 banks underwriting public offerings during the years 2004-2005.

This paper uniquely contribute to the banking strategic management literature showing that the effect of particular network positions on banking performance depends on bank-level characteristics. This finding suggests that managers need to assess a firm's ability to get knowledge and information from their external environment and make adjustments based on firm alliance portfolios. The study proceeds as follows.

In the first section I develop theory and hypotheses. Following I outline my study setting and methodology, and present results. Finally, I present implications, limits and conclusions.

THEORY AND HYPOTHESES

Several studies have shown that differential access to network resources leads to resource asymmetries between the firms, to differences in competitive behaviour and therefore to different performance levels. A substantial body of literature has analyzed both the contingencies under which one network structure is more beneficial relative to the other (Burt, 2007; Soda et al., 2004; Ahuja, 2000; Rowley et al., 2000; Podolny 1993) and the relations between firms' network position (deriving from ties with other firms) and performance (Almeida et al.,, 2003; Lee et al., 2001; Powell et al., 1999; Stuart, 2000).

In synthesis, relationships in a network are potential sources of firm internal resources (Langlois, 1992; Nohria, 1992), whose effectiveness is dependent by network structure (Burt, 1992) and by internal capabilities (McEvily and Zaheer, 1999). Following, quality and relevance of information and resources deriving from favourable networks positions can improve a firm's performance (Cross and Cummings, 2004).

In fact, an important feature of network ties is that they function as "pipelines" through which information' and resources' flows are exchanged among firms (Owen-Smith and Powell, 2004). The strategic contingencies and resource dependency frameworks (Hickson et al., 1971; Salancik and Pfeffer, 1977) posit that power derives from the control of relevant resources. This concept of control by one single actor implies that others in the network have few alternative sources for acquiring the resource, such that the actor controls or mediates others' access to the resource. Centrality in the network is the extent to which an actor controls or is deeply involved in these network flows (Gnyawali and Madhavan, 2001; Wasserman and Faust, 1994; Burt, 1980).

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If networks provide channels for the exchange of information and resources then central firms can use these channels to reach key information and resources that enhance, from one side, the knowledge about strategies and resources of competing firms, even in the absence of any asset flows (Harrigan, 1986) and, from the other side, power (Gnyawali and Madhavan, 2001; Wasserman and Faust, 1994; Burt, 1980).

Actors occupying central positions in a network are viewed as potentially powerful because of their greater access to and possible control over relevant resources (Boje and Whetten, 1981). Central firms enjoy advantages from network position also because their resource superiority reduces competitors' likelihood of response (Chen, 1996) as less central competitors will find it more difficult and costly to give a response because their limited information set. In addition, since central competitors are more prestigious and more powerful, other firms are less likely to want to provoke them. Thus:

Hypothesis 1: Firms enhance performance by having a central position in their network

Moreover, strategic management literature recognizes that the feasibility of a competitive strategy depends on the availability of firm-specific resources (Barnett et al., 1994; Haunschild and Ni, 2003; Cohen and Levinthal, 1990) whose combinations may be an ex-ante condition or a constraint more or less stringent (Mottura, 2006).

In further detail, the importance of firms' information processing ability is generally recognized (Cross and Cummings, 2004; Smith et al., 1991). The theory of organizational information processing (Tushman and Nadler, 1978) suggests that as the volume and complexity of

information in the environment increase, the organization needs to have correspondingly high levels of information processing capacity.

One of the most important firms' features, depending on the availability of firm-specific resources, regards the level of diversification / specialization on different market segments (Shipilov, 2006; Haunschild and Ni, 2003; Grant, 2001; Barnett, Greve and Park, 1994).

Since firms operating in different market segments (generalists) are exposed to a large amount of information from multiple environments, they are likely to possess the internal capabilities needed to acquire and use network resources more efficiently and effectively than do firms operating in few market segments (specialists) (Miller and Chen 1994; Hambrick, 1982; Khandwalla, 1973).

Specifically, market diversity exposes firms to a great variety of ideas and events that prompt exploration and change (Khandwalla 1973) and to a broad range of competitive options (Hambrick, 1982) that increase knowledge about the possibilities of their environment. An homogeneous learning environment could limit information acquisition and may foster inertia (Miller and Chen 1994).

Two important considerations can be made at this regard. At first, because network centrality provides greater volume of information from various sources, an increase in centrality would mean the need for a corresponding increase in information processing capacity. Furthermore, diversified firms with high network centrality could be better able to benefit from information received from partners since the capacity to exploit the advantages of new opportunities in different market segments than do specialist firms. The latter, concentrating their business in a few industry segments have a deep understanding of these segments but a lack of capabilities useful for the other market segments and this circumstance doesn't allow them to fully capitalize

the opportunities deriving from a central position in the network. In other terms, specialization can affect a firm's ability to engage in information and referrals exchange within networks, as well as its ability to benefit from this exchange. Thus:

Hypothesis 2: Specialization reduces a firm's benefits of having a central position in the network

RESEARCH METHODOLOGY

I tested my hypotheses in the investment banking industry, where banks create network ties as a result of their participation in syndicates that underwrite issues of initial public offerings (IPOs). Coalitions between rival underwriters with complementary abilities provide mutual benefits and enhance the underwriting services for the clients. Banks form syndicates in order to facilitate the placement of new securities and to reduce financial risks to individual underwriters (Song, 2004).

Banks that act as lead managers usually contribute for a great part of the capital required to fund issues. The rest of the capital is contributed by other syndicate members, whose participation is important for reducing risks to individual banks and for broadening the distribution of shares to different investor groups (Forestieri, 2005).

The possibility that a bank become involved in a syndicate depends on the relationships that this bank maintains (considered as a sort of "social capital") and on how it is able to use these connections, based on its internal capabilities (Shipilov, 2006).

The quality of connections helps banks in central positions (considered as brokers in the network) to obtain invitations to participate in a variety of deals and, in this way, to have access to a wide variety of syndication opportunities across different industries. This condition can enhance performance of banks as a result of the increased trading that their partners are likely to generate.

Moreover, network centrality enables both specialists and generalists to access a wide variety of partners that can be invited to join a syndicate but, because a greater ability to exploit access to heterogeneous sources of invitations, generalist banks have a better possibility to operate in different market segments than specialist banks (Pollock et al., 2004).

In fact the possibility to get and to use information on business opportunities is contingent upon banks' structures and often generalists' internal resources are useful in a greater number of industries than specialists' ones (Rosenberg, 1982).

This means that when generalist banks receive invitations from their partners to exploit opportunities in diverse market segments, they are more likely to accept since they already operate in these segments. On the contrary, specialist banks are able to get fewer benefits from invitations that they receive since internal capabilities are segment-specific.

The only time that a specialist can take advantage from invitations is when they involve opportunities in the proper sector of expertise. In this sense a bank high specialization level could reduce the benefits of having a central position because of the lack of internal capabilities give less opportunity to exploit centrality.

In other terms specialists can construct syndicates only in their narrow sectors of specialization, generalists can lead syndicates issuing securities in various market segments. Specialists'

constricted focus can again contribute to their underutilization of opportunities deriving by network position.

DATA AND VARIABLES

I tested my hypotheses using data on syndicates formed by all banks underwriting public offerings in Euro area during the years 2004-2005. For the purposes of my analysis I considered in the regression model a representative sample (83% based on 2005 data) of 78 banks participating in both the years. In this observation period, these banks underwrote 234 issues and formed 194 syndicates.

In order to find out network characteristics in this industry I used life history information on all offerings placed by banks in 2004 and in 2005 from various European stock exchanges and from database Zephyr (Bureau van Dijk). After I defined inter-bank networks considering banks' memberships in underwriting syndicates and organized my data into socio-matrices. To test my hypotheses I used the following regression equation model:

$$MKT\_SHARE_t = \beta_0 + \beta_1 * MKT\_SHARE_{t-1} + \beta_2 * SPECIALIZATION + \beta_3 * CENTRALITY + \beta_4 * SPECIALIZATION * CENTRALITY + \varepsilon$$

One of the most important indicators of performance in investment banking industry is market share since it places underwriters in the rankings, called league tables, used to compare banks in

this industry (Li and Rowley, 2002; Ritter and Welch, 2002; Dunbar, 2000; Chemmanur and Fulghieri, 1994; Podolny, 1993; Eccles and Crane, 1988).

Following this approach, I considered market share at time t (dependent variable) as performance indicator for banks. In addiction, market share at time t-1 was used as control variable for my analysis.

I measured banks' market shares at time t and at time t-1 allocating the euro value of each offering made during the year among the members of the syndicate that underwrote the deal. If a deal did not involve a syndicate, to the only bank (lead manager) I assigned 100 percent of the offering's value. If a deal involved multiple syndicate members, I spitted the underwriting value among members equally. To compute banks' market shares, I then divided each bank's deal values by the total value of public offerings for each year.

My main theoretical variables were a measure of the bank's specialization and a measure for the centrality in a bank's network.

Following Shipilov (2006), to compute specialization I used Herfindahl index: at first I defined market segments on the basis of the sector of the economy in which banks underwrote public offerings. After, basing on NACE codes I identified ten major segments that were used to compute the specialization index.

When this measure approached 0, it indicated that a particular bank underwrote deals in all ten market sectors and was thus a generalist; when this measure approached 1, the bank was a specialist.

Because of the reciprocal nature of the relationships among a generic bank i and a generic bank j in a syndicate, I measured these in symmetric socio-matrices, wherein cell ij was coded "1" if there was a link between banks and "0" otherwise.

I computed centrality using betweenness measure considering banks' participation in syndicates and using the software UCINET VI (Borgatti, Everett and Freeman, 2002).

In general, centrality of an actor refers to a role of mediation and brokerage within the network that derives from a position that give more possibilities to control resources and to connect subgroups. In particular, betweenness (Freeman, 1977) refers to how often an actor network is in the shortest route to reach the other actors, regardless of the direction of the report (or out). A growing value of betweenness increases the likelihood that the plaintiff will be able to influence the interaction between the other actors.

Moreover, in order to test hypotheses involving nonlinear effects of theoretical variables, my model contained interaction of linear terms of a main effect variable with a moderating variable. Specifically, my variable of interest was the interaction term between linear terms of specialization and centrality To check whether correlations between main effects and interactions affected results, I computed the model's average variance inflation factors (VIF).

Table 1 summarizes these variables.

Insert Table 1 about here

The analysis of the estimated regression coefficients in model allowed the test of my hypotheses. In detail, the following hypotheses are verified if:

- Hypothesis 1: coefficient β_3 is positive and statistically significant;

- Hypothesis 2: coefficient β_4 is negative and statistically significant.

ANALYSIS AND RESULTS

Table 2 presents maximum, minimum, means, standard deviations and correlations among variables included in the analysis.

Insert Table 2 about here

Further, I tested the hypotheses using the regression equation model (defined above) that modelled the influence of specialization and betweenness variables, the interaction between linear terms of specialization and betweenness and the control variable (market share t-1) on banks' market share t (see Table 3).

Insert Table 3 about here

Hypothesis 1 (banks enhance performance by having a central position in their network) is strongly supported ($\beta_3 = 0,00025$; $p < 0,01$).

Hypothesis 2 (specialization reduces bank's benefits of having a central position in the network) is also supported ($\beta_4 = -0,00059$; $p < 0,01$).

The value R^2 adjusted for the model is *0,571* while the F statistic is to 26,631 and significance of the model is confirmed. Model's average variance inflation factors (VIF) is within an acceptable range (6,46).

I have considered the possibility that the relationships between centrality and firm performance are reciprocal. In fact, while centrality does contribute to firm performance, a high firm

performance can in turn improve the centrality of the firm, because high-performing firms attract invitations from fellow firms. To show the robustness of results, I applied a 2SLS simultaneous equations approach: since the OLS and 2SLS results are qualitatively similar, this analysis failed to support the assertion that banks' performance affects centrality[1].

DISCUSSION

This study attempted to examine the relationship among position in the network, firm level specific features and performance.

By considering the social processes that underlie the formation of IPO syndicates in investment banking industry, I examined performance's consequences of underwriters' different levels of specialization in terms of opportunities that they can extract from their network-building activities.

Results provide evidence that the ability of firms to benefit from their positions within networks is contingent upon the levels of specialization and underline that together network boundaries and internal capabilities influence performance. From strategists' viewpoint, the study shows the importance of combining internal mechanisms and network mechanisms, recognizing the importance of network connections' quality. The study also shows the combined effect of specialization and centrality on a bank's performance. As hypothesized, benefits associated with centrality in the network can be reduced by high levels of specialization. My contribution highlights at least two important issues:

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[1] These results are available upon request.

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- network access automatically doesn't means information access but the latter is also dependent on the quality of network ties;

- ability to exploit network information or, better, network opportunities is conditioned by internal resources of firms and more specifically the "absorptive capacity". When the absorptive capacity is high, centrality is likely to result in high firm performance. In contrast, when absorptive capacity is low, the centrality-performance relationship is likely to be less positive or even negative.

Managers should consider the fit among a firm's ability to get knowledge and information from their external environment in their alliance building activity.

Furthermore, this study contributes to researchers' understanding of the IPO market's operations analyzing the performance consequences of the social processes that underlie the formation of IPO syndicates. Form banks' viewpoint, not recognizing the importance of a fit between their own characteristics and network position could result in strategic decisions detrimental to alliance-building behaviour and performance. Therefore it is particularly important for banks operating in investment banking to consider both i) the value of having a central position in the network and ii) the cooperation with actors which possess the capabilities to provide useful knowledge/opportunities.

As for other researches, also this study has several limitations. At first, I used market share as a dependent variable ignoring other performance measures such as profitability or shareholder value. However in investment banking, market share reflects banks' ability to earn underwriting fees that contribute to the return on financial assets, and consequently profitability. In addiction,

I also didn't use alternative specifications of banks' market shares (for example, assigning 25, 50 or 75 percent of a syndicate's value to lead managers).

In addition, my specialization measure could be limited by considering only one particular segment of the investment banking industry (underwriting public offerings), since I was not able to measure the involvement of banks in other important areas such as merger and acquisition, corporate bonds emissions, advisory, etc.

Yet, the definition of inter-bank networks considers only banks' memberships in underwriting syndicates and doesn't account for other levels of analysis. In fact, other types of links, such as interlocking directorates and friendship networks between individuals across banks, might also be noteworthy conduits for the transfer of information and knowledge.

Finally, although the primary focus of my analysis was the moderating effects of specialization on the relationship between network embeddedness and performance, other important questions could be raised. In particular, an interesting area for future research regards the possibility that dynamic changes in network embeddedness take place as a function of reputation or in response to emerging competitive challenges and opportunities. As a consequence, another important research area is the way through which specialization choices and, more generally, internal capabilities constrain or improve the ability to reconfigure network ties when changes occur in competitive environment.

CONCLUSIONS

This study belongs to that field of research examining the impact of a firm's network position on performance from a contingent point of view.

The focus is given to the banks' strategic advantage deriving from exploiting a central position in the networks of relationships among competing banks. Simply having access to information about the existence of business opportunities is not sufficient to permit their exploitation, without the possibility to use this information due to the lack of internal capabilities. In fact firms' ability to use network ties for accessing information about opportunities and choices otherwise not available is depending on internal resource endowments and in particular by "absortive capacity".

Implicit in these arguments is the question if are all banks equally able to benefit from a central network position and this study accounts for both network and bank-specific factors influencing performance.

Based on the investigation of network position and specialization levels of actors operating in the investment banking industry in Europe, using data on syndicates formed by 78 banks underwriting public offerings during the years 2004-2005, I find that banks enhance performance by having a central position in their network and that high specialization levels reduce a bank's benefits of having a central position in the network.

There are strong theoretical reasons to propose a contingent role of network's features with banks' characteristics in enhancing performance.

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TABLE 1

Variable specifications

Variable	Specification
Dependent variable	
Performance	Bank's market share in period t.
Main effects	
Specialization	Herfindahl index of market presence.
Centrality	Freeman (1977) betweenness measure
Specialization *	
Centrality	Interaction term between linear terms of specialization and centrality
Control variable	
Past performance	Bank's market share in period t-1

TABLE 2[a]

Mean, Standard Deviations, and Correlations

	Mean	Std. Deviation	1	2	3	4
MKT_SHAREt	0,01	0,02				
MKT_SHAREt-1	0,01	0,01	0,70			
SPECIALIZATION	0,66	0,33	-0,54	-0,46		
CENTRALITY	15,29	39,11	0,42	0,29	-0,41	
SPECIALIZATION X CENTRALITY	4,72	12,46	0,29	0,19	-0,31	0,95

a. Pairwise correlations are presented.

TABLE 3[a]

Predictors of banks' market share

Variable	Coefficients
INTERCEPT	0,00799**
MKT_SHAREt-1	0,65105***
SPECIALIZATION	-0,00822**
CENTRALITY	0,00025**
SPECIALIZATION X CENTRALITY	-0,00059**
Number of observations	78
R2	0,593
R2 Adjusted	0,571
F Statistic	26,631***
Average VIF	6,46

a. Coefficients and t statistics listed

† p < 0,10

* p < 0,05

** p < 0,01

*** p< 0,001